

**FACTORS INFLUENCING ADOPTION OF MOBILE BANKING SERVICES IN
INFORMAL SETTLEMENTS OF MAVOKO SUB-COUNTY IN MACHAKOS
COUNTY, KENYA**

BY

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DECLARATION

STUDENT’S DECLARATION

I Elizabeth Nyawira Kamunyu - Registration number 15/05840 declare that this is my original work and has not been presented for a degree in any other university.

Sign: Date:

SUPERVISOR’S DECLARATION

This project has been submitted for examination with my approval as university supervisor.

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FACTORS INFLUENCING ADOPTION OF MOBILE BANKING SERVICES IN INFORMAL SETTLEMENTS OF MAVOKO SUB-COUNTY IN MACHAKOS COUNTY, KENYA

ABSTRACT

The purpose of this study was to establish the determinants of adoption of mobile banking services at the Bottom of the pyramid (BOP) in Mavoko Sub-county within Kenya's Machakos County. The study aimed to answer research questions and test hypothesis based on perceived cost, perceived ease of use, perceived usefulness and perceived risk as factors that influenced adoption of mobile banking. Demographic factors were also studied as moderating variables. The investigation utilized the Technology Acceptance Model (TAM) and Extended TAM otherwise called (TAM2) by Davis (1989) as the model of study. This study additionally utilized the Unified Theory of Acceptance and Utilization of Technology (UTAUT) by Venkatesh et al.(2003) and Rogers Innovation Adoption Theory by Rogers (1999) in order to understand in depth the adoption of technology innovations such as mobile banking. The study meant to fill the gap that existed in research as it concentrates in Kenya's versatile and unique Bottom of the Pyramid population (BOP). Basic arbitrary sampling using the simple random sampling method was utilized to obtain 100 respondents over the age of 18 years earning below USD 2.5 every day in the slums or 'ghettos' of Mavoko Sub-county. The respondents were classified in two distinct groups of youthful adults (18-35years) and the more seasoned adults (36 years and above). For purposes of this research, respondents were drawn from all the twenty slums in Mavoko Sub-county. These slums are largely characterized by destitution. Residents of these areas have poor access to proper medical services, safe water supply and sanitation. They live in structures made of poor building materials and experience security challenges. These ghettos are often situated in the high risk regions such as near industries, riverbanks and railroad lines. Residents of these slum areas rely on casual employment opportunities for their livelihood and survival. In order to collect data, questionnaires were given to these respondents. A likert scale was utilized in order to qualify responses in the study. The information was then coded, examined utilizing multiple regression and then studied in order to recognize key discoveries, make recommendations and draw conclusions. Statistical Package for Social Sciences (SPSS) version 21 was used for analysis. Findings in this study demonstrated that the utilization of mobile phones at the BOP is gradually growing as retail banks continue offering versatile financial products using mobile channels. The study presets a chance for banks to gain a deeper understanding of the BOP population by learning their consumer behavior thereby allowing them to create products that best suit this demographic. This study also demonstrated that there still a significant number of individuals at the BOP who are not informed about mobile banking technology and its related benefits. The investigation found that perceived ease of use and perceived cost ($B=0.242$; $p \text{ value} =0.006$; $B=0.240$; $p \text{ value} =0.005$) were found to be the most significant components affecting the take-up of mobile banking technology.

Key Words: Mobile Banking, Perceived Risk, Percived Cost, Perceived Usefulness, Perceived Ease of Use

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DEDICATION

I dedicate this research project to my parents, my Dad - The Late Mr. Stanley Kigombe who passed away during the period of my study, my Mum - Mrs. Josephine Kigombe and siblings – Nderitu and Shiku who have supported me through the entire process of conducting this research.

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LIST OF ACRONYMS AND ABBREVIATIONS

BOP – Bottom of the Pyramid

GDP – Gross Domestic Product

GNI – Gross National Income

GSM – Global System for Mobile Communications

IFC – International Finance Co-operation

MNO – Mobile network operator

PDA – Personal Digital Assistant

POS – Point of Sale

PwC – PricewaterhouseCoopers

TAM – Technology Acceptance Model

TAM 2 or Extended TAM – Extended Technology Acceptance Model

Telcos – Telecommunication Companies

SMS – Short Messaging Service

UN – United Nations

UNDP – United Nations Development Programme

UTAUT – Unified Theory of Acceptance and Use of Technology

USSD - Unstructured Supplementary Service Data

DEFINITION OF TERMS

Agency banking	Refers to the use of third party agents by a principal who is a licensed financial intermediary or a mobile network operator to provide financial services to customers (Aduda, Kiragu, & Ndwiga, 2013)
Mobile Banking or M-banking	Refers to the on demand delivery of the bank-related financial services digitally through the mobile devices. Other services offered by m-banking include non-financial transactions of bank related services (Alliance for Financial Inclusion , 2019)
Mobile Money	Refers to access of financial services through mobile phones. The term ‘mobile money’ inherently points to a convergence of two industries that have been traditionally separate: mobile telecoms and financial services. (Global System Money Association (GSMA), 2009)
M-PESA	(‘M’ is for mobile and the term ‘pesa’ is Swahili for money) is a money transfer service provided on mobile phones. The service was launched in 2007 by Vodafone for Safaricom (Safaricom PLC, 2019)
Mobile Network Operator / Telco	Refers to company that is licensed by a government to provide telecommunications services through mobile devices (Alliance

for Financial Inclusion , 2019)

M-KESHO		Refers to mobile savings, credit and insurance product from Equity Bank in Kenya that allowed customers to pair their bank account with their M-PESA account, making it convenient to move money between accounts (Muthiora, 2015)
M-shwari		Refers to a banking product for M-PESA customers by the Commercial Bank of Africa that allows customers to conduct financial transactions through a mobile phone while earning interest on money saved (Financial Sector Deepening -FSD Kenya, 2016)
Formal services	financial	Refers to financial services offered by regulated institutions such as banks , remittance service providers, microfinance institutions and MNOs as opposed to informal financial services, which are unregulated (Global System Money Association (GSMA), 2009).
Gross Domestic Product	Domestic	Refers to the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output (United Nations , 2019)
GDP per capita		Refers to the gross domestic product divided by mid-year population. Growth is calculated from constant price GDP data

in local currency (United Nations , 2019)

Gross National Income Refers to the sum of a nation's domestic product and the net income it receives from overseas. (United Nations , 2019)

Gross National Product Refers to the broad based measure of income generated by a nation's residents from international and domestic activity while GNI per capita measures the average amount of resources available to persons residing in a given economy and reflects on the average economic well-being of a population (United Nations , 2019)

Unbanked Refers to the customers who are usually very poor. They do not own a bank account at a formal regulated institution (Global System Money Association (GSMA), 2009)

Under banked Refers to the customers who may own a basic transaction account offered by a formal regulated institution but still have financial needs that are unmet or are not appropriately addressed. (Global System Money Association (GSMA), 2009)

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Mobile banking (referred hereafter as m-banking) refers to the use of mobile devices such as mobile phones to provide financial information to clients, for example, financial records, moving assets and instruments anytime anywhere (Ensor, Montez, and Wannemacher, 2012). Mobile money exchanges include the transformation of money to into electronic value between people, organizations and governments for various uses (GSMA, 2014).

M-banking differs from the conventional physical model of banking which required significant investments in resources - in particular human resources and operational overheads. M-banking has the ability to reach millions of customers much more effectively and efficiently due to its ubiquitous nature unlike conventional banking, which is only accessible during the bank's working hours (Porteous, 2006). M-banking basically exists in two models (Porteous, 2006). Firstly, transformational m-banking, which is characterized by utilizing a cell phone to offer financial products to the unbanked populations who are to great extent individuals in the low pay segment. The second being additional m-banking, which is characterized as the utilization of cell phones as an extra channel to an existing mode of banking.

The idea of internet banking was presented in the 80's. Its development however came about in the early 90's (Tchouassi, 2012).The history of m-banking could be followed back to 1992 when payments done over GSM telephones and SMS were accessible in Finland. From

then, the lion's share of Finnish clients would utilize internet banking thereby diminishing the need of physical bank offices (Mari and Minna, 2004).

Globally, there has been a major shift in the delivery of financial services, from microfinance initiatives to the financial inclusion agenda (PwC,2016). Financial inclusion means that persons and enterprises have access to gainful and affordable financial products and services that meet their needs – including payments, investments, savings, credit and insurance all delivered in a responsible manner to facilitate sustained growth and productivity. It allows for inclusive growth as it provides access to credit which encourages business investments (World Economic Forum, 2017).

A report by IFC (2014) explains that great world economies have high rates of financial inclusion per capita. As per World Bank (2014) countries with GDP per capita above \$15,000, have high account penetration. France for example had a high record of 99%.Others such as China had 79%, the United Kingdom, the United States and Germany have a record entrance of over 80%.

From a worldwide viewpoint, there are 2 billion adult unbanked individuals (Demirguc-Kunt, Klapper, Singer, and Van, 2014) with 350 million of this being in Sub-Saharan Africa where Kenya belongs. Among poor people financial inclusion is improving however not as quick enough as may be desired (World Bank, 2017). Account ownership in poor people and their families is low especially in the Middle East and Sub-Saharan Africa. This is contrary to high-salary economies where account possession is widespread. Western economies such as Canada, France, Germany, Japan and the United Kingdom, there is no significant distinction on record between adults in the poorest 40% of family units and those in the wealthiest 60%

with the portion of adults. Bank account penetration has exceeded 95% in the less fortunate population. In the U.S 87 percent of grown-ups in the less fortunate population have a bank accounts (Demirguc-Kunt, Klapper, Singer, and Van, 2014). This therefore necessitates the need to conduct this study due to low uptake of formal financial services so as to determine the factors that influence adoption of mobile banking services in informal settlements in Kenya.

Provision of financial services via mobile channels in Africa has risen as a significant driver of financial inclusion due to its transformative power. Policymakers and organizations have appreciated the importance of financial inclusivity as a pillar in development and global progress (Cull, Demirgüç-Kunt, and Lyman, 2012). The quick dispersion of data and correspondence that has occurred in Africa has demonstrated that mobile money can hasten the financial inclusion process in Africa (Kumar, Balasubramanian, &Subramanian, 2012).In the recent years, mobile money financial services are now relatively easily available to the urban and rural poor due to technological improvement and advancement (Saleem and Rashid, 2011).Banks have been able to build core competencies through technologies that have great speed thereby reducing their service turnaround time, improving their agility to business cycles and reducing the overheads related to brick and mortar establishments (Ayo, Adewoye, and Oni, 2010).Additionally, mobile banking allows for scaling of the banks customer base of since operational costs are reduced significantly (Hanning and Shah, 2010).

In Africa, mobile banking provides a foundation that allows for further innovations and scaling providing a great ability to improve the quality of lives of individuals (Alliance for Financial Inclusion - AFI, 2012).Mobile banking utilizes the infrastructure provided by Mobile Network Operators (MNOs). The Global Financial Development report done by The

World Bank (2014) demonstrates that financial services via mobile will help the unbanked individuals globally to access money more easily. In Sub-Saharan Africa, mobile money grew to 16 percent in 2011 covering individuals who were excluded from the conventional banking services (Cull, Demirgüç-Kunt, and Lyman, 2012).

M-banking facilitates quicker and progressive monetary exchanges, increases transactions volumes and promotes access to funds to a huge population of the unbanked (Maimbo, 2010). M-banking clients have had buy-in based on the fact that it is a flexible and convenient mode of processing and receiving payments (Porteous, 2007); (Mas and Radcliffe, 2011); (Masinge, 2010). In Kenya, M-Pesa, a mobile money platform by Safaricom PLC promoted financial inclusion as it was a means for cash to be transferred in small denominations (Johnson, Brown, and Fouillet, 2012). M-Pesa had a great transformative power in the financial landscape in Kenya (Financial Sector Deepening Kenya - FSD, 2019)

Studies done in Malaysia by Cheah, Sim, Oon, and Tan (2011) made an investigation on elements influencing m-banking adoption. Perceived value (PU), perceived usability (PEOU), relative favorable position (RA) and individual creativity (PI) were observed to be of influence to adopt m-banking. Perceived risk (PR) on the other hand was observed to be contrarily connected with the m-banking appropriation. Social standards (SN) were observed to be immaterial to Finland's m-banking adoption.

An examination led by Mari (2003) on reception of m-banking in Finland showed that specific qualities of m-banking affects are adoption. The qualities included relative preferred position, similarity, correspondence and triability. Another review in South Africa by Consultative Group to Assist the Poor - CGAP in zones served by WIZZIT which was a m-

banking service was done on people who possessed both cell phones and bank accounts. The investigation indicated that the individuals who took up WIZZIT by and large had a higher income levels, higher levels of education and were more skilled in their occupations. Individuals also lived in urban areas and were older in age (Ivatury and Mas,2008).

In Kenya, mobile money and m-banking services is an idea that has picked up traction greatly because of its capacity to drive the financial inclusion agenda in Kenya's economic pillar of Vision 2030. This study aimed to investigate the factors that influence mobile banking adoption to the BOP. It is therefore paramount to understand the adoption behavior of this unique population. This information is important in policy making and in encouraging innovations that will assist in reducing or completely eradicating poverty as well as addressing the problem of inequality that exists between Kenya's rich and poor populations (UNDP, 2017).

1.1.1 M-banking in Kenya

Kenya has a Gross National Income (GNI) per capita of \$1,046-\$4,125 (World Bank, 2015) making it a low to middle income status country. In the past banking in Kenya was built for the more sophisticated customer. Banking was characterized by brick and mortar locations which led to high operational overheads leading to high transaction fees for the customers. The products were not customized for the different population segments (Chogi, 2007). It is in the previous decade that this manner of provision of financial services was discarded.

Players in the financial sector in Kenya had undermined the influence of the poor unbanked population until Equity Building Society (EBS) propelled it in 1984. EBS provided

financial products that catered to the poor leading in a drastic paradigm shift in the sector. It was the need for more affordable financial channels that was the catalyst for mobile money and eventually m-banking in Kenya. The pioneer to this being Safaricom PLC through their M-Pesa product in 2007 followed by Airtel (formally Zain) with their product Airtel money in 2009.

Further innovations on the M-Pesa revolutionary platform occurred in 2012, Safaricom Network in association with Commercial Bank of Africa (CBA) came up M-Shwari which was a service that enabled clients to open an account remotely through their cell phone. M-shwari allowed for Kenyans to build their credit worthiness by savings and could consequently access short term credit facilities while paying a facilitation fee to CBA (Muthiora, 2015). Other bank and telcos collaborations have been done since such as KCB Bank with Safaricom Network (KCB M-PESA product) and Equity Bank cooperated with Airtel Network (Equitel Product) both in 2015.

These changes in Kenya's financial sector led to closures of brick and motor banks due to the high operational expenses involved (Muthiora, 2015). As at the year 2013, the number of adults facing exclusion was at 25.4% (Muthiora, 2015). This was a leapfrog jump from the year 2005 data which showed that the same population was at 39.3%.

Mavoko is located in Machakos District, about 25 kilometers southeast of Kenya's capital Nairobi. Mavoko is the fastest growing municipality in Kenya, as Nairobi's industrial area extends towards the Athi River along the Nairobi-Mombasa highway. Mavoko City Council has an estimated population of 85,000 and covers an area of 700 square kilometers. Mavoko's rapid growth is due to industrial expansion in the area and people who work in Nairobi and

Machakos find it more affordable to live in Mavoko and commute. Developing industries are the main employers in the region and attract large numbers of semi-skilled and unskilled workers from all over the country. Urban poverty is widespread in Mavoko because a large part of the population lives in slums. According to (UN-HABITAT, 2004), slum dwellers exist with an average monthly income of 3,000-5,000 KShs (US\$40-65). For the purpose of this study, the target population comprised of individuals who are above 18 years of age living in the informal settlements of Mavoko area, though involved in other forms of informal banking, they are not using m-banking.

1.2 Statement of the Problem

Research has shown that accessibility to financial services is critical for economic growth and poverty reduction (Kimenyi & Ndung'u, 2009). M-banking technology will make Kenya realize its vision of reducing poverty, ensuring high levels of savings by its citizenry which is key enabler of its financial investments needs (Kenya Vision 2030, 2007). M-banking is beneficial for both the service provider and the user. For the service provider the benefits include the opportunity to adopt a fully data-driven approach to drive business growth as well as build databases to enhance their competencies. On the other hand, consumers are able to enjoy efficient, quick and convenient service anywhere anytime which provides great value for them (Laukkanen & Lauronen, 2005). In addition to that, data obtained by the banks can be analyzed to provide trends, analysis that the customer can use to make better financial decisions for themselves.

Globally, despite a large number of mobile money initiatives, half of the world's population approximately 2 billion adults remains unbanked with majority of these being in

Africa and Asia. According to Financial Sector Deepening (2019) Kenya's formally unbanked population is at 17.1% accounting for approximately 10 million people. These statistics pose a great problem to attaining Kenya's Vision 2030. The Global UN Sustainable Development Goals 2030 Agenda provides statistics that indicate that there is a high level of inequality in distribution of resources that exists between the rich and the poor populations in Kenya where less than 0.1% of the population (i.e 8,300 people) own more wealth than the bottom 99.9% (i.e more than 44 million people). The richest 10% of people in Kenya earned on average 23 times more than the poorest 10% (Oxfam International, 2017). In Mavoko 64% of the slum population lives below the poverty line as well as experience food poverty, which means that they do not have access to a nutritionally adequate diet. In order for mobile banking service providers to effectively provide mobile banking services to the previously unbanked or low-income population, there is a need for proper understanding of the BOP population's behaviour patterns.

Various studies have been conducted in Kenya with regard to adoption of m-banking. For instance, Ndumba (2014) studied the variables that had an impact on adoption of m-banking in Kenya's banked population. Results showed that the perceived risk of loss and perceived fear of failures within systems were the main reasons for low adoption while perceived convenience was found to positively affect adoption of m-banking. Achieng and Ingari (2015) investigated the variables that affected mobile banking adoption in The Kenya Commercial Bank and found that perceived risk was the key factor impeding the adoption of mobile banking, on the other hand influence of perceived ease of use of mobile banking on mobile banking adoption did not affect mobile banking adoption. Opilli & Muturi (2016) carried out a study on factors that affected Equity bank's M-KESHO mobile financial service

adoption. In the study, customer's greatest concern in using mobile banking was security and privacy risk. Financial cost was also found to be negatively influencing usage of mobile banking.

While these studies shed light on m-banking in Kenya, they were specifically done on the high and middle income banked population who were already using banking products. It is for this reason that this study will focus on the BOP population in Kenya's Mavoko Sub-County; a unique population that has not been sufficiently studied. This unexplored territory still holds a lot of potential, benefit and opportunity to the customer, government and service providers in the private sector. To the knowledge of the researcher, not a single research has been identified, investigated, studied and concluded with regard to this unique population. It is with this background information that the researcher therefore sought to establish the factors influencing adoption of m-banking services at the BOP in Mavoko Sub-County in Machakos County in Kenya.

1.3 Research Objectives

1.3.1 General objective

The general objective of this study was to establish the factors influencing adoption of m-banking services at the BOP.

1.3.2 Specific Objectives

This study was guided by the following specific objectives:

- i. To establish the influence of perceived cost on the adoption of m-banking for customers at the BOP

- ii. To determine the influence of perceived usefulness on the adoption of m-banking for customers at the BOP
- iii. To assess the influence of perceived ease of use on the adoption of m-banking for customers at the BOP
- iv. To evaluate the influence of perceived risk on the adoption of m-banking for customers at the BOP
- v. To determine the moderating effect of demographic factors on the factors influencing adoption of m-banking services for the customers at the BOP

1.4 Research Questions

The study was guided by the following research questions;

- i. What is the influence of perceived cost on the adoption of m-banking for customers at the BOP?
- ii. To what extent does perceived usefulness influence adoption of m-banking for customers at the BOP?
- iii. What is the influence of perceived ease of use on the adoption of m-banking for customers at the BOP?
- iv. What is the influence of perceived risk on the adoption of m-banking for customers at the BOP?
- v. Do demographic factors have a moderating effect on the factors influencing adoption of m-banking services for the customers at the BOP?

1.5 Justification of the Study

Mobile banking adoption differs from one population to another and from one jurisdiction to the next. Policymakers globally have recognized the importance of evidence based decision making (IFC,2011). The researcher therefore believed that this study will shed light on consumer behavior at the BOP. Financial inclusion programs can be best developed and executed by use of data driven studies. This study will therefore be of benefit to policy makers who will use the data to make decisions at policy level in order to promote inclusivity.

This study also aimed to make a contribution to the knowledge of how financial products and services can be created or enhanced for the BOP population. Through this study the researcher aimed to unveil the consumer habits of the BOP to financial products; this was by understanding how they save money, make and receive payments, how they obtain credit and insurance. The study also aimed to provide information of how the BOP made decisions on adoption of mobile banking. Through understanding these factors , the mobile banking service providers will need to approach the BOP client differently as this may require a different kind of blue print(Pitta, Guesalaga , and Marshall, 2008).The elements that were studied include ; perceived cost , perceived usefulness , perceived ease of use and perceived risk.

This research makes a contribution to academic research and adds to the in-depth understanding of technology adoption of m-banking services at the BOP consumer base. The study will identify the knowledge gaps and provide suggestions for further research. This will form a base for scholars who are interested in studying this area in future.

1.6 Scope of the Study

The study drew the sample of respondents from a sample frame of all the 20 slums of Mavoko Sub-County. The author (Malik, 2014) in a report for the UNDP defines the Bottom of the Pyramid (BOP) as individuals who earn less than \$2.5 per day. This is the largest and poorest socio-economic group. The study was based on The Technology Acceptance Model (TAM) and the Extended TAM (TAM2) constructs. The study was limited to only four constructs of perceived cost, perceived usefulness, perceived ease of use and perceived risk. The study focused on individuals who are both unbanked and the under banked. The study limited itself to individuals of 18 years and above as this is the age limit that a person is legally considered to be an adult by the Kenya Laws and consequently allowed to register for mobile services with a Telecommunications company upon acquiring an identification card. The adults were categorized into two groups of young adults aged between 18-35 years and the older adults of 36 years and above. The study was carried out in the year 2019.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of both theoretical and empirical literature. The theoretical review section discusses three theories that were utilised to guide this study. The empirical review on the other hand discusses literature based on past studies. In addition to that, this chapter discusses the conceptual framework which depicts the relationship between the independent variable, dependent variables and moderating variables to be studied.

2.2 Theoretical Review

This section presents the theoretical literature previously done by other scholars as aligned by the study variables. The study is supported by three Technology adoption theories; Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Roger's Innovation Adoption Theory.

2.2.1 Technology Acceptance Model (TAM) and Extended TAM

According to TAM, new technology is adopted by users based on their intention to utilize it which is in turn determined by their beliefs (Davis, 1989). TAM recommends that perceived ease of use and perceived usefulness are the most significant factors in defining the differences in the user's expectations. Perceived usefulness essentially means how much an individual accepts that utilizing a specific technology will make a task at hand simpler. Perceived ease of use is defined by how much an individual views that utilizing a specific technology would be effortless (Davis, 1989). In his investigation Davis (1989) these two

factors were most important in influencing individuals to adopt technology. Perceived usefulness was most significant of the two. The TAM model has been stretched out to incorporate different factors which impact different fields that deal with technology adoption. The TAM model has been widely approved and accepted. It is a model that which can be modified by utilizing different constructs (Masinge, 2010).

The TAM model was initially modified to TAM2 by Venkatesh and Davis (2000) to incorporate two more factors including the Social Influence Processes and the Cognitive Instrumental Processes. Analysts such as (Luarn and Lin, 2005) examined TAM and combined it with The Theory of planned behavior (TPB) by (Ajzen, 1991). These researchers, studied the factors that would affect the intention to use mobile banking technology by users. These factors included perceived ease of use (PEOU), perceived credibility, self-efficacy, and perceived financial cost (Luarn & Lin, 2005). In the city of Bangkok in Thailand (Sripalawat, Thongmak, & Ngramyarn, 2011) also studied the factors that affected acceptance of m-banking such as perceived usefulness, societal norms ,perceived ease of use, self-efficacy ,perceived risk, lack of information and perceived cost.

Different constructs and factors affect different populations uniquely (Sripalawat et al.).Based on this data these two models (TAM and TAM2) will be utilized in this investigation. This theory states that adoption of new service or technology is determined by the user's intention to use the system which is in turn determined by the user's beliefs about the system. This theory therefore anchors this study since it addresses the dependent variable on the adoption of mobile banking by highlighting the various factors that influence adoption of new technologies.

2.2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Unified Theory of Acceptance and Use of Technology (UTAUT) is a technology and innovation acceptance theory developed by (Venkatesh, Morris, Davis, & Davis, 2003). UTAUT was formulated through a review and of eight theories. These theories were previously utilized by earlier research to explain use of systems. The theories included the reasoned action theory, the theory of technology acceptance, theory of motivation, the planned behavior theory, a combined theory of planned behavior, theory of personal computer use, diffusion of innovations theory, and the theory on social cognition.

The UTAUT explains a user's intention to make use of information systems. A user's expectation on performance and effort were key determinants of intention to use the system. Similarly, social influence, and facilitating conditions were found to be variables that had an impact on intention and use. The moderating variables in the study were determined to be age, gender experience and an individual's voluntary will.

The UTAUT theory explains that users' make decisions to use technology depending their expectations on usability, performance and effort as well as influence from those in their social circles. This theory was of importance to the researcher in the course of conducting this research in the informal settlements in Mavoko Sub-County in Kenya.

2.2.3 Roger's Innovation Adoption Theory

The Roger's innovation diffusion theory has been used to explain innovation adoption. During the diffusion process of technology in the theory, consumers are observed to be either innovators 2.5% , early adopters 13.5%, early majority 34%, late majority 34% and the

laggards 16% respectively (Rogers, 1999). In the theory, five factors influenced adoption and acceptance of technology innovations including relative advantage, complexity, compatibility, trialability, and observability. Researchers (Li, Liu, and Ji., 2014) examined people's views about these attributes of innovations and found that they were significant factors in affecting an individual's adoption behavior.

Relative advantage alludes to the extent at which the technology is viewed or perceived as superior to its predecessor in cost, performance and risk. Compatibility refers to the degree to which an innovation is considered to be suitable for a customer's needs and lifestyle. Complexity is the extent of difficulty in comprehension and use of the innovation. Observability alludes to the degree to which the innovation is recognizable by others. Trialability is the ability for the innovation to be studied, tried and tested using experiments and derive data. (Rogers, 1999).

Rogers (2003) observed that poor people were often in the laggards segment in the diffusion theory. The reason for this mainly being financial constraints. The poor were also viewed as risk averse and less educated. The late adopters were observed to be very critical of innovation. Both the laggards and late adopters have limited resources and lack the awareness and knowledge of the innovations. As such, they first want to make sure that an innovation works before they adopt it. They tend to decide on whether to proceed with adoption of an innovation after it has been successfully adopted by other members of the society.

Majority of the adoption theories have been found to explain the adoption of various solution based technologies launched in the marketplace. These theories propose different constructs but fundamentally strive to explain comparable concepts. Adoption of mobile

payment technologies has however been found to vary from one place to another (Sripalawat et al. ,2011). This theory is relevant to this study since it addresses the various factors that influence adoption of new technologies such as mobile banking. It specifies that for any new technology to be adopted, the attributes of an innovation that influence adoption and acceptance behavior are relative advantage, complexity, compatibility, trial ability, and observability, where perceived risk and prior internet knowledge fall under relative advantage and compatibility respectively.

2.3 Empirical Review

This section presents a review of literature previously done by other scholars. The literature has been aligned with variables to be studied.

2.3.1 Perceived Cost and Adoption of M-banking

Perceived cost is characterized as the extent of an individual's acceptance that he will have some form of financial burden when utilizing technology such as m-banking (Jeong and Yoon, 2013).The costs could include use of SMS,data charges and mobile phone ,registration and transaction costs (Chitungo and Munongo ,2013), (Tobbin, 2010).

The BOP population have a low purchasing power, are sensitive in relation to costs and value conscious (Masinge, 2010). In India, a study coordinated by Dass and Pal (2011) exhibited that cost influences mobile banking adoption to a great extent negatively. This examination exhibited that India's poor unbanked masses were only contented with paying on the extent of 1-2 Indian Rupees equivalent of Ksh 1.41-2.83 in transaction fees. Experts in India recommended that since the rural populations were predominantly poor, the cost of mobile banking ought to be brought down in order to facilitate faster adoption. The study was

conducted in India whereas the current study will be carried out in Kenyan slums where the residents are living below the poverty line to establish their perceptions towards adoption of mobile banking and the factors that can make them embrace it.

An empirical study by (Yu, 2012) used the UTAUT model in order to study the factors which influence adoption of m-banking by consumers. The researcher investigated perceived credibility, perceived financial cost, performance expectancy and social influence as the factors which influenced the intention and behavior to use m-banking. Moderating variables of age and gender were used in the study. Social influence and perceived financial cost were observed to be the most influential factors in that order. Performance expectancy and perceived credibility came in third and fourth respectively. The study observe that the male gender were more concerned with perceived cost unlike the female gender. The study also found that perceived financial cost was not significant to respondents who were aged below 30 years and over 50 years. The study used age and gender as the moderating variables while the current study introduces another moderating variable (education) to establish its influence on the relationship between factors influencing adoption of mobile banking and uptake of mobile banking.

In rural Zimbabwe, a study revealed that perceived cost was a significant factor and it deterred the adoption of m-banking. Chitungo & Munongo (2013) who conducted the study used the extended TAM. They added constructs including social norms, perceived risk relative advantages, personal innovativeness and perceived costs. Their study found that relative advantages, personal innovativeness and social norms had a positive significant influence on user's attitude. The study presented a conceptual and contextual gap, this is because the study was conducted in Zimbabwe and looked at different variables other than

those the current study focused on (perceived cost, perceived usefulness, perceived ease of use, perceived risk with demographic factors as the moderating variables).

In Kenya a study by (Omwansa, Waema & Lule, 2012) in Kenya's M-KESHO m-banking product which was owned by Equity bank which showed that cost greatly impacted mobile banking adoption. The study on the M-KESHO utilized the extended TAM including the factors of perceived credibility, perceived cost and perceived normative pressure, self-efficacy. Researchers found that the all these factors had a significant influence on the adoption of M-KESHO in Kenya. The study did not consider the demographic factors which play a critical role in making the decision to adopt mobile banking which this study sought to incorporate to ascertain their moderating role in the relationship.

Various studies such as that by Aker and Mbiti (2010) carried out in Sub-Saharan Africa observed that the costs involved in acquisition of mobile handsets affects the adoption of m-banking services. In the study, those that adopted mobile phones early were predominately the well to do, young and urban populations. This was attributed to the high prices of mobile phones and the services that were on offer at the time. In the study however, late adopters included both young and old, rich and poor, urban and rural thereby not showing any particular incline in behavior exhibited by people due to age, social status or place of dwelling. This observation had been enabled by the introduction of cheaper handsets and lower value airtime cards.

Contrary to these studies a study in Kenya, researchers Micheni *et. al* (2013) explored the effect of transaction costs and other facilitating conditions of mobile banking such as technical infrastructure costs that can potentially affect mobile banking. In the study

transactional costs were found to be of a low significance with a structural weight of 0.02. A comparative examination in Taiwan's middle income populace by Wu and Wang (2005) uncovered that costs involved in m-banking was not as critical to them but instead the study revealed that the, middle class m-banking client was more concerned with the potential risks involved. A research with similar findings in Bahrain's banking customers done by (AlSoufi & Ali, 2014) and (Jeong & Yoon, 2013) in Singapore showed that perceived cost did not affect the a customer's intention to use mobile banking. The studies had contradictory findings with some showing significant influence between perceived cost and adoption of mobile banking and others showing no significant effect. This presented a research gap which this study intended to fill by testing the following null hypothesis.

H₀₁: Perceived cost has no significant influence on the adoption of m-banking for customers at the BOP

2.3.2 Perceived Usefulness and Adoption of M-banking

Perceived usefulness is the extent to which an individual believes that utilizing a particular technology, system or innovation would make their work easier while improving performance (Davis, 1989). Aldas-Manzano *et. al* (2012) asserts that perceived usefulness pertains to the benefits that mobile banking provides and whether by using a mobile handset provides an enhanced experience when conducting financial transactions. Perceived usefulness has been identified by various studies as a variable that has a significant influence on mobile financial service adoption (Aboelmaged & Gebba, 2013); (Kabir, 2013), Masinge (2010) ; Munir & Idrus (2013); Koenig-Lewis, Palmer, & Moll (2010).

The theory of planned behavior assumes that individuals intend to take part in any particular behavior is influenced by three determinants of perceived behavior control, perceived subjective norms and attitude (Ajzen, 1991). A study on mobile financial service adoption by UAE university students in Dubai by Aboelmaged & Gebba (2013) integrated TAM and the variables of the Theory of Planned Behavior (TPB). In the combined model of study, perceived ease of use, perceived usefulness, perceived behavior control, perceived subjective norms and attitude were the five constructs used. The researchers found that attitude; subjective norm and perceived usefulness (indicated by the factors of efficiency, timely services and convenience) had an influence of significance on the m-banking adoption while perceived ease of use and behavioral control had no effect of significance on the adoption. In a similar study in Bangladesh, convenience being a factor of perceived usefulness also was found to be the influencing factor of most significance for bank customers (Kabir, 2013).

In South Africa, a study investigating the adoption of m-banking in the BOP by Masinge (2010) found that two factors were of positive impact on mobile banking. The two were identified as perceived usefulness and perceived ease of use. In the same study, perceived cost and perceived risk were determined to be of a negative influence on adoption of m-banking. These findings supported the studies which used the constructs based on the technology approaches. In Indonesia's Makassar City, a similar research was conducted by (Munir & Idrus, 2013) where the original TAM model with perceived ease of use and perceived usefulness was used to gain a deeper understanding of acceptance of mobile financial services. The findings revealed that adoption financial services delivered via mobile phones was greatly influenced by the variables of perceived ease of use and perceived

usefulness. Perceived usefulness was however found to have a greater influence on the adoption behavior in comparison to perceived ease of use. Another study at an Islamic Bank in Malaysia was carried out to examine the factors that affected the intention of customers to use mobile banking (Amin *et. al* ,2008). In the research, perceived usefulness, perceived ease of use, perceived credibility, information accessible on mobile banking and normative pressure were revealed to be significant factors in the acceptance of m-banking.

Singapore's research was conducted among the current customers of internet banking facilities to determine the elements that influenced the adoption of mobile banking. Gender was studied as a moderating variable in the study. It was observed that perceived usefulness, social risk and social influence were the most important factors that influence the male consumers' intention to adopt and utilize m-banking facilities (Riquelme & Rios,2010). The study was conducted in a developed country whereas the current study was conducted in a developing country in the informal settlement where the residents are living in abject poverty.

Young customers in Germany were interviewed in an online survey by (Koenig-Lewis, Palmer, & Moll, 2010) who used the extended TAM model using compatibility, perceived usefulness, trust, credibility, perceived risk and cost on behavioral intention. The study revealed that the most significant factors on mobile banking adoption was compatibility, perceived usefulness, and risk. The study did not consider demographic factors which this study did to ascertain the influence of age, gender and education level on mobile banking adoption in the informal settlements in Kenya.

Contrary to these studies, a study conducted in Saudi Arabia's banking population with the variables of perceived usefulness, perceived risk, perceived ease of use, perceived trust and

compatibility showed that perceived usefulness did not affect the intention to use mobile banking by these customers (Al-Jabri, 2015). Similar observations were made in Sudan (Karma, Ibrahim, & Ali, 2014) who studied the factors of perceived risk, perceived ease of use and perceived usefulness and perceived trust. Perceived usefulness was found to be of no influence to the adoption of mobile banking adoption by Sudan's banked customers. The reviewed studies had mixed results that perceived usefulness had a significant influence and others illustrated insignificant influence hence the necessity to test the following null hypothesis.

H₀₂: Perceived usefulness has no significant influence on the adoption of m-banking for customers at the BOP

2.3.3 Perceived Ease of Use and Adoption of M-banking

Perceived ease of use is described as the extent to which an individual believes that using a particular innovation would be effortless (Davis, 1989). Aldas-Manzano et. al (2012) further explained that usability may also be viewed by whether m-banking is difficult to learn and utilize.

In Singapore, a study that utilized the Technology Acceptance Model (TAM) by Jeong and Yoon (2013) researched five constructs of perceived efficacy, perceived credibility, perceived cost, perceived usefulness and perceived ease of use. In the study, perceived ease of use was found to be the most significant factor affecting mobile banking uptake. Riquelme and Rios (2010) completed an investigation in Singapore and observed that perceived ease of use had a greater influence on the female respondents. Social norms of this Singaporean banked population were found to have a direct correlation to mobile banking

adoption. Perceived ease of use was found to be of greater significance in the Nigerian tertiary institution student population in a study by (Hamza & Shah, 2014).

In Indonesia, a study by (Munir & Idrus, 2013) carried out a research to study the TAM constructs of perceived usefulness and perceived ease of use in the banking customers. The study had findings which showed that perceived ease of use had a significant impact on the intention to use mobile banking. In the study, perceived usefulness had a major influence in comparison to perceived ease of use.

In their examination in Zimbabwe, Chitungo and Munongo, (2013) found that perceived ease of use affected mobile banking uptake significantly. Similarly in the same study, costs, social norms and relative advantage were found to have a positive correlation towards m-banking. In Somalia, a study conducted was observed that perceived ease of use had a positive influence on adoption of mobile banking. Social norms and security were also determined to have a positive impact on mobile banking (Sayid, Echchabi, & Aziz, 2012). A study in India's rural population on the adoption of mobile financial services, observed that perceived ease of use was a critical factor affecting mobile banking adoption significantly (Dass and Pal, 2011). Other factors studied included, technology readiness and trust which were all found to be of significant impact on the uptake of mobile financial services in the studied population. This study was conducted to find out if the findings would still hold true if done in a developing economy.

In Kenya, (Omwansa *et.al*, 2012) studied the factors affecting m-banking adoption of the M-KESHO application solution. In the study, the banking customers' behaviour to adopt the application was studied. The factors investigated included perceived usefulness, perceived

credibility ,perceived self efficacy and transaction cost. Findings from the study indicated that perceived ease of use was found to be of significant positive influence in the adoption of m-banking .

A study in Malaysia by (Cheah *et al*, 2011) found that perceived ease of use was found to be of significant impact in the studied population. Other constructs of the study included relative advantages as well as personal innovativeness which were also found to be of significance in the adoption of m-banking in the Malaysian population under study .In contrast studies conducted on the Malaysian banking population found that perceived ease of use did not have a significant impact on the uptake of m-banking (Daud *et al*.2011). In the same study , perceived credibility and customer awareness were found to be of significant impact in the uptake of mobile banking.

Other studies that have similar findings to Malaysia study include the study conducted by his (Quan *et al* 2010) in China who observed that perceived ease of use did not have a significant influence on the behavioural intention of China's population.Perceived behaviour control , perceived credibility and perceived cost were also among the constructs of this study and were found to have significance in adoption to mobile banking. The reviewed studies showed that perceived ease of use was significant in influencing adoption of mobile banking, this study was conducted to find out if the findings would still hold true in the informal settlements where the respondents live in abject poverty.

H₀₃: Perceived ease of use has no significant influence on the adoption of m-banking for customers at the BOP

2.3.4 Perceived Risk and Adoption of M-banking

Perceived risk is uncertainty about the outcome of the use of a particular innovation or technology (Chitungo & Munongo, 2013). In mobile banking, risk may be perceived by existing consumers and potential consumers in different ways. Digital financial solutions provided through the medium of a mobile phone require a substantial amount of trust to exist between the customers and the bank (Thusi & Maduku, 2019). Perceived risk may be viewed by customers in various ways; the main ones include security and privacy risk, performance risk, financial risks. Security and privacy risk refers to the uncertainty that a customer has with regard to third party access to their private information which may lead to loss of funds (Featherman & Pavlou, 2002). Performance risk is defined by (Grewal, Gotlieb, & Marmorstein, 1994) as the uncertainty that is consumers experience when a product fails or malfunctions thereby producing undesired results. Featherman & Pavlou (2002) define financial risk as the uncertainty that exists due to fraud, transaction errors or banking errors within the electronic service systems.

A study in Delhi by (Singh, 2014) conducted on mobile banking customers of various banks using ANOVA and Factor Analysis. The study analysed the four factors of reliability, security risk, efficiency and responsiveness found that perceived risk had a significant negative impact on the adoption of mobile banking. Similar studies in the UAE by (Chavali & Kumar, 2018) studied the factors of perceived benefit, perceived ease of use, perceived usefulness and perceived risk. In this study, factor analysis was used in the analysis. The observed results were that perceived risk was found to be significant in influencing mobile banking adoption.

In Malaysia, (Cheah, Sim, Oon, and Tan, 2011) conducted a study investigating the factors of perceived use, perceived ease of use, relative advantage and personal innovativeness. In the study all the factors except for perceived risk were found to be of a positive influence to mobile banking adoption. Mobile banking adoption was found to be negatively affected by perceived risk. The study was done in a developed country and looked into different variables as compared to the current study.

A study in Kenya by (Ndumba, 2014) investigated the factors of trust, perceived risk , perceived convenience and relative advantage that may affect mobile banking adoption. The findings of the study was on banked customers found that perceived risk was found to negatively influence the adoption of m-banking. The study focused on banked customers whereas this study focused on unbanked individuals from the informal settlements.

These findings provide a contrast to a study carried out by Suoranta (2003) in Finland that revealed that the Finnish banking population did not perceive risk as an important factor in adoption of m-banking. Similar findings in studies by (Hosseini, Fatemifar, & Rahimzadeh, 2015) conducted in mobile banking users and non users found that perceived risk was not a factor that influenced the adoption of mobile banking in Kuwait. Perceived risk was also found to be an insignificant factor in the rural underbanked population in India(Dass & Pal, 2011). In South Africa , a study by (Masinge, 2010) done on the Bottom of the Pyramid population found that perceived risk was not a factor that influenced m-banking adoption. Most of the studies done elsewhere showed that perceived risk was not a factor that influenced mobile banking adoption. This study sought to test the following null hypothesis in Kenyan context.

H₀₄: Perceived risk has no significant influence on the adoption of m-banking for customers at the BOP

2.3.5 Demographic factors and Mobile Banking

Demographic factors are those characteristics that make up a population to be studied. They include gender, age and education. An online survey study in Jordan observed that demographic factors had a greater influence on m-banking adoption than factors such as trust and perceived usefulness. Findings indicated that the young adults aged 17-35 had the highest chance of becoming users of mobile banking (Alafeef, Singh, & Ahmad, 2011). This observation was attributed to their interest in technology and current innovations. In the same study men were found to be greatly interested in technology and therefore were observed to be likely to use m-banking than the females in Jordan. In addition to these observations, the respondents that with higher education were found to have a greater likelihood to adopt mobile banking.

Abayomi, Olabode, Reyad, & Teye (2019) in Nigeria conducted a study using the ANOVA and t-test on the banked customers in Benin city. In the study, demographic factors of age, income and occupational status all had a significant influence in the adoption of mobile banking. Conversely, gender and education were found to have an insignificant influence in the adoption of mobile banking.

Chawla and Joshi (2018) did an empirical investigation on the moderating effect of demographic variables on mobile banking adoption using the banked customers and users of online banking. The study analyzed if demographic characteristics influenced user attitude towards mobile banking. Results show that gender, age, qualification, experience,

occupation, income and marital status were significant moderating variables. However, educational background did not show any moderating effect. Although earlier studies on technology adoption models have received considerable empirical validation, most of the studies did not consider moderating variables. This study included the moderating variables to help lessen the inconsistencies found in past research studies done in Kenya.

Studies in Ethiopia such as that by (Teka, 2017) was conducted on digital banking customers. ANOVA analysis was used to analyse data with findings showing that gender had a significant influence on adoption in digital banking. The demographic factors of age , income , education level and occupation status had no significant in the adoption of digital banking for customers in Ethiopia.

Goyal, Pandey, & Batra (2012) conducted a research in India using the two-tailed Pearson correlation and found that gender was the only demographic factor that had a correlation to mobile banking. Other factors that were studied included age, level of education , occupation and financial income. The same study had findings that indicated that males were more likely to adopt mobile banking than the females.

Merhi, Hone, Tarhini, & Ameen (2020) conducted an empirical examination of the moderating role of age and gender in consumer mobile banking use in Lebanon and found that consumer behavioural intention was significantly moderated by age through its relationship with facilitating conditions and trust among Lebanese respondents, and performance expectancy, effort expectancy, hedonic motivation, price value and habit among their British counterparts. As for gender, a significant moderating effect was evidenced in the

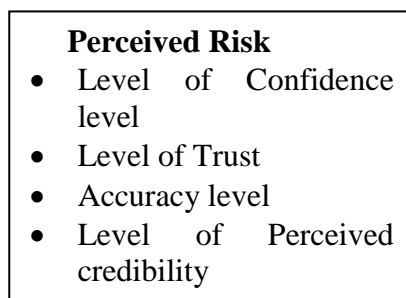
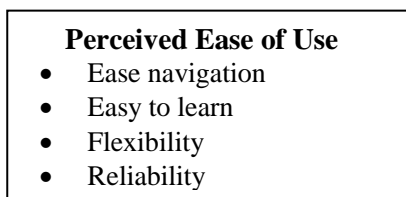
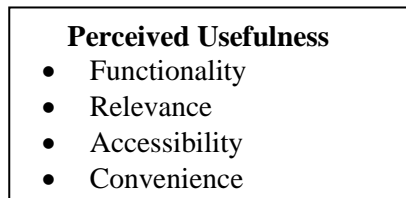
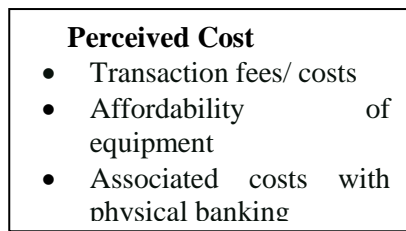
Lebanese, but not the British sample, on the level of performance expectancy, effort expectancy, facilitating conditions, price value and perceived security.

Age, income, gender were found to have no effect in mobile banking adoption according to a study by (Ramdhony & Munien, 2013) in Mauritius population. In the same study the level of education was found to be of influence to the adoption of mobile banking. Similar observations were observed in Bangladesh's mobile banking users by (Khan, Akter, & Akter, 2017) who observed that gender did not have an impact on the increase of adoption of mobile banking over the four years of the research. In the same study the age group of 20-24 years was found to be the age group that adopted mobile banking the most with male users being the majority. Panel regression analysis showed that differences in demographic factors such as age, gender and occupation had no influence on the adoption of mobile banking. The study incorporated moderating variables to provide an insights into mobile banking adoption variation between different individuals in the Country.

2.4 Conceptual Framework

The conceptual framework was developed combining relevant constructs discussed in the literature review .The TAM and extended TAM constructs provided the foundation for the factors that influenced the adoption of mobile financial services. The independent variables f studied included perceived usefulness, perceived ease of use, perceived cost, and perceived risk. Adoption of m-banking services was studied as a dependent variable. The study included the demographic factors of gender, age and education as moderating variables.

Independent Variables



H

H₀₃

H₀₄

Demographic factors

- Gender
- Age
- Education

Moderating

H

Dependent Variable

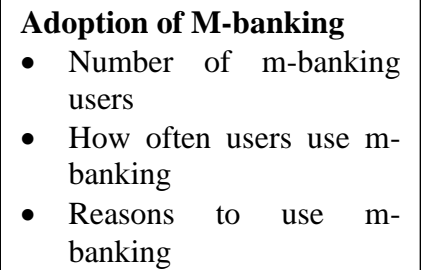


Figure 2.1: Conceptual Framework

2.5 Operationalization of Variables

This section defines how variables in the study were operationalized. All study variables are adopted from similar studies and modified to suit this research. A summary of the different variables is presented in Table 2.1 below.

Table 2.1: Operationalization and Measurement of Study Variables

Type of variable	Variables	Measurement	Scale	Data collection method
Dependent	Adoption of m-banking	<ul style="list-style-type: none"> • Number of people using m-banking • How often users use m-banking • Reasons to use m-banking 	Likert scale	Structured questionnaire
Independent	Perceived cost	<ul style="list-style-type: none"> • Transaction costs • Affordability of equipment • Associated costs with physical banking 	Likert scale	Structured questionnaire
Independent	Perceived usefulness	<ul style="list-style-type: none"> • Effectiveness level • Efficiency level • Functionality level • Accessibility level • Convenience 	Likert scale	Structured questionnaire
Independent	Perceived ease of use	<ul style="list-style-type: none"> • Ease navigation • Easy to learn • Flexibility • Reliability 	Likert scale	Structured questionnaire
Independent	Perceived risk	<ul style="list-style-type: none"> • Confidence level • Trust level • Accuracy level • Level of credibility 	Likert scale	Structured questionnaire
Moderating	Demographic factors	<ul style="list-style-type: none"> • Gender • Age • Education 	Ordinal scale	Structured questionnaire

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was used in this study. The Research design, target population, sampling procedure, design and sample size, data collection methods, tools and procedures of data analysis procedures that were used are discussed in length in this chapter. The chapter also discusses the measures used to ensure validity and reliability of the study instruments. This chapter helped in adequate planning for the study.

3.2 Research Design

A descriptive design was adopted in this research. Descriptive design was found to be suitable as it explains the characteristics of a given population .In addition to that, data analysis techniques were used to answer the questions of how, who, what, when, where in relation to the study to eventually lead to conclusions. Descriptive research is a study of status, it's based on the premise that problems can be solved and practices improved through observation, description and analysis. It is used when a researcher intends to collect information or data about peoples' attitudes, opinions, habits or any other social characteristics through administering questionnaires or interview guides for in-depth analysis.

3.3 Target Population

A population is the group that the research will focus on in accordance to (Cooper & Schindler, 2003).Target population is the particular populace from which data was acquired. Ngechu (2004) describes a target population as a well-characterized and defined set of

individuals, events or elements that are under investigation in a study. According to Census 2019, Mavoko Municipal has a population of 84,906 individuals with half of them 42,408(including children and teenagers) living in the informal settlements who are the respondents of this study. Adults living in the informal settlements in Mavoko accounted to 50% of this population approximately 20,000 individuals (Kenya National Bureau of Statistics, December 2019). The target population in this study was persons of 18 years old years and above at the Bottom of the pyramid in Mavoko sub-county. These individuals have a monthly income of KES 8,000 and below (an equivalent of USD 2.5 every day). Persons of 18 years and above were chosen as that is the age that one is recognized as an adult in Kenya. Consequently, an individual is able to acquire a personal identification card and eligible to register for mobile services from the service providers. The group of adults under study were divided into two groups being 18-35years which was considered as young adults and the second group being those above 36 years and above which was considered as older adults.

The target population was drawn from Mavoko Sub-county in Kenya. This population included persons who were involved with informal forms of banking and were not using the digital finance services provided by mobile banking .This area was chosen by the researcher as the inhabitants are of low income exhibiting the characteristics that the researcher was interested in. Twenty informal settlement areas commonly known as slums made up the sample frame from which the sample to be studied was drawn.

3.4 Sampling and Sampling Procedure

This study utilized simple random sampling method to identify the individuals to be included in the sample. Random sampling is a method that is supported by (Kothari , 2004)

as it satisfies the law of statistical regularity; meaning that if a sample is chosen at random , on average , the population will have the same characteristics as the said sample. In using simple random sampling the researcher ensured that each of the elements in the population had an equal and fair chance of being selected. This method therefore ensured that the data was representative and had a highest statistical efficiency thereby reducing the errors that may be encountered in sampling.

The sample size was calculated using Yamane (1967:886) formula. The general rule relative to acceptable margins of error in survey research is 5 - 10%.

$$n = \frac{N}{1 + N(e)^2}$$

Where N is the target population and e is the margin of error

$$n = \frac{20,000}{1 + 20\,000(0.1)^2} = 100$$

In this research, the sample was drawn from the twenty slums in Mavoko Sub-county. Each slum chosen provided five elements to be studied. The elements included :a young adult male and female, an older adult male and female and a community leader. The sample size of this research therefore consisted of 100 respondents.

3.5 Research Instrument

This study utilised primary sources of information obtained by use of questionnaires. A questionnaire is defined by (Kothari , 2004) as a document consisting of pre-formulated set of questions with closely related alternatives typed and printed in a particular order and

administered to respondents. Questionnaires are advantageous to use as they have low costs of administration, reduces interviewer bias, allows for respondents to be reached conveniently and can be administered to large samples (Mugenda & Mugenda, 2003). These advantages make questionnaires more dependable to use during research.

An ordinal scale was used to obtain the respondents' basic demographic responses. A 5-point Likert scale was utilised to quantify the respondents' responses. The scale measured how strongly respondents agreed or disagreed with the statements relating with the attitudes, perception, value and behaviour under study. The 5-point Likert scale consisted of strongly disagree, disagree, neutral, agree and strongly agree. The scales were used to convert qualitative responses into quantitative values (Shende & Upagade, 2013), (Zikmund & Babin, 2007) (Zikmund, Babin, Carr, & Griffin, 2010)

3.6 Validity and Reliability of the Study

The questionnaire used during this study was pre-tested in order to measure and enhance its validity and reliability. The questionnaire was presented to a leading group of experts for review in order to assess whether all the aspects of the study to be measured were captured correctly. The opinions of these experts were considered and factored in to ensure the face validity of the study. In addition, the researcher discussed the questionnaire with two randomly selected bank managers. Ambiguous statements were clarified during this exercise as well as proposals were considered to enhance the questionnaire's validity.

Internal consistency test was utilized to test for reliability of the questionnaire. Cooper and Schindler (2003) define a measure as being reliable to the degree that it gives results that are consistent. The Cronbach's Alpha (α) coefficient was used to assess the internal consistency

and the stability of the scales used in the questionnaire. Internal consistency assesses the correlations and consistency that exists among questions in a survey or questionnaire. It is used to measure whether the all items in a study when measured will give the similar results which will be reliable. In this study the questionnaire was tested on 10% of the sample to ensure that it was relevant and effective, which translated to 10 randomly selected respondents. These respondents were not included in the final study sample in order to control response biasness.

Cronbach's alpha α results usually range from 0 and 1. George & Mallery (2003) provides the rule of thumb that when the results are: $\alpha > 0.9$ – Excellent, $\alpha > 0.8$ – Good, $\alpha > 0.7$ – Acceptable, $\alpha > 0.6$ – Questionable, $\alpha > 0.5$ – Poor and $\alpha < 0.5$ – Unacceptable. A result score of 0.7 is considered to be statistically acceptable and reliable for a research study (Nunnally, 1978). In this regard, the researcher of this study made use of this standard to measure the internal consistency of the questionnaire.

3.7 Data collection procedure

Self-administered questionnaires by respondents were utilized in this study to retrieve necessary information and data. The researcher delivered questionnaires to the respondents using the introduction letter which introduced the research topic. Care and control was exercised to ensure that all questionnaires were duly returned to the researcher. To achieve this, a register of questionnaires was maintained for tracking questionnaires that had been administered. The researcher collected all the completed responses within the stipulated timelines as any questions from the respondents were clarified on the spot. This was the most

preferred way of collecting data as since random sampling was the sampling method used in the study.

3.8 Data Processing and Analysis

According to (Zikmund *et.al*, 2010) data analysis refers to the application of reasoning to understand information that has been collected for purposes of determining patterns and deriving a conclusion in a study. In order to determine patterns of the population under study, the data analysis process was guided by the research objectives. The process of data preparation involved data checking, editing, coding, interpreting, transcribing, cleaning, sorting and coding. Data was then entered into a statistical package for social sciences (SPSS) version 21 for generation of graphical diagrams, tables, descriptive and inferential insights.

Multiple regression was utilized to test the significance of influence between the study variables of the independent and dependent variable. The model of fitness was tested at 95% confidence level allowing for the researcher to draw conclusions. For each independent variable, if the value $p < 5\%$ the null hypothesis would fail to be accepted and the alternate hypothesis fails to be rejected. Consequently, if the value $p > 5\%$, then the null hypothesis fails to be rejected and the alternate hypothesis fails to be accepted.

Assumptions on the statistical model had to be assessed prior to conducting the regression analysis. Therefore, diagnostic tests were carried out as recommended by (Njuguna, 2013).The study utilized skewness and kurtosis measurement to check for normality of the study and distribution of variables as recommended by (Myoung, 2009).The generally acceptable rule being that a variable was reasonably close to normal if its skewness and kurtosis values ranged between the values of - 3.0 and + 3.0.

The multiple regression model with the moderating variable being demographic factors took the following form:

Where, **DF** = Demographic Factors

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_1 X_1 * DF + \beta_2 X_2 * DF + \beta_3 X_3 * DF + \beta_4 X_4 * DF + \varepsilon \dots \dots \dots \text{(ii)}$$

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This chapter presents the results of the study. The descriptive and inferential statistics were presented as guided by the research objectives. The interpretation and discussion of the results are also presented in this section.

4.1.1 Reliability Results

The reliability results are presented in Table 4.1 below. The instrument was considered reliable since all the variables had Cronbach's alpha value higher than 0.70. It is agreed among researchers that an alpha greater or equal to 0.7 shows that an instrument is reliable in measuring what it was intended to measure (Sekaran, 2003, Robert, 2006).

Table 4.1: Reliability Results

Variable	Cronbach's Alpha	No. of Items
Adoption of mobile banking	0.873	5
Perceived cost	0.830	6
Perceived usefulness	0.750	9
Perceived ease of use	0.826	7
Perceived risk	0.764	9

4.2 Response Rate

A total of one hundred (100) questionnaires were administered to the respondents. The 100 questionnaires were filled properly and returned which represented a response rate of 100%. According to Mugenda & Mugenda (2003), a response rate of 50% or more is

adequate when conducting a research. Babbie(2001) also asserted that return rates of 50% are acceptable for a researcher to proceed with analysis and subsequently publish their work. A response rate of 60% was rated as good and 70% as very good.

Table 4.2: Response Rate

Response rate	Frequency	Percent
Filled and Returned	100	100%

4.3 General Information

4.3.1 Gender of the Respondents

The respondents required to indicate their gender on the questionnaire. Figure 4.1 illustrates that the male gender accounted for (60%) and whilst the female gender accounted for (40%). This implies that both male and female were practicing informal banking with the men being more than the women. This further means that the study will help identify the factors that could influence uptake of mobile banking to cater for all genders.

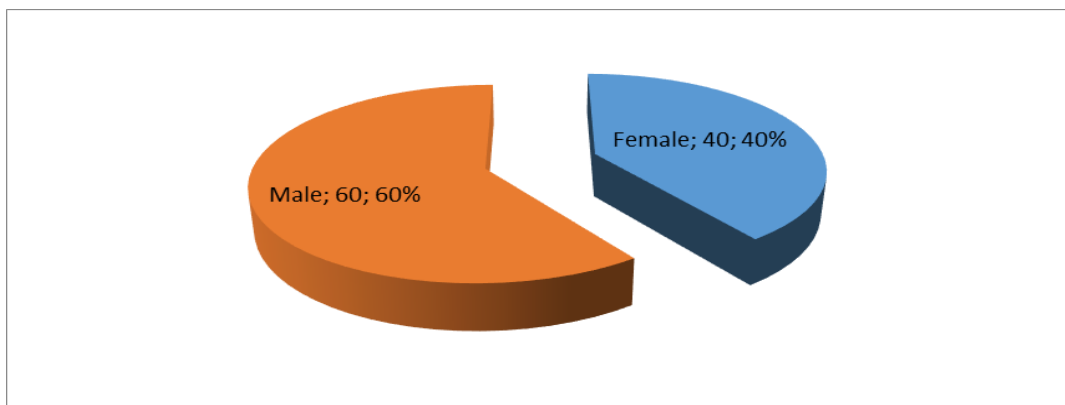


Figure 4.1: Gender of the Respondents

4.3.2 Age of the Respondents

The questionnaire required that the respondents should indicate their age brackets. Table 4.3 illustrates that 46% of the respondents were aged between 36-45 years, 25% were aged between 26-35 years, 12% were aged between 46-55 years, 9% of the respondents were aged between 56-60 years and finally 8% were aged between 18-25 years of age. There were no respondents that were above 60 years of age. The findings imply that those that are unbanked cut across different age groups which could provide accurate responses in order to aid in financial inclusion of everyone as Kenya works towards its Vision 2030.

Table 4.3: Age of the Respondents

Age Bracket	Frequency	Percent
18 – 25 years	8	8%
26 – 35 years	25	25%
36 - 45 years	46	46%
46 – 55 years	12	12%
56 - 60 years	9	9%
Above 60 years	0	0%
Total	100	100%

4.3.3 Level of Education

The respondents were asked to indicate their highest level of education. Table 4.4 below shows that 48% of the respondents had attained secondary education level, 17% had attained primary education, 10% of the respondents had attained certificate level and 9% had attained diploma level of education. 16% of this population had not received any formal level of education. The findings imply that the respondents had attained post primary education with only a small percentage having no formal education, thus the need to find out why they have not yet embraced mobile banking or formal banking.

Table 4.4: Level of Education

Level of Education	Frequency	Percent
None	16	16%
Primary level	17	17%
Secondary level	48	48%
Certificate level	10	10%
Diploma level	9	9%
Total	100	100%

4.3.4 Marital Status

The study sought to find out the respondents' marital status. Figure 4.2 shows that 46% of the respondents were married while 35% were single, 10% were divorced and 9% were widowed. The findings imply that the low uptake of mobile banking cuts across different marital status, it does not matter whether you are married, single, divorced or widowed but the needs and factors that make them shy away is something that needs to be investigated thus the need to embrace each and everyone's opinion so as to guide the policy makers on how to include these people at the BOP.

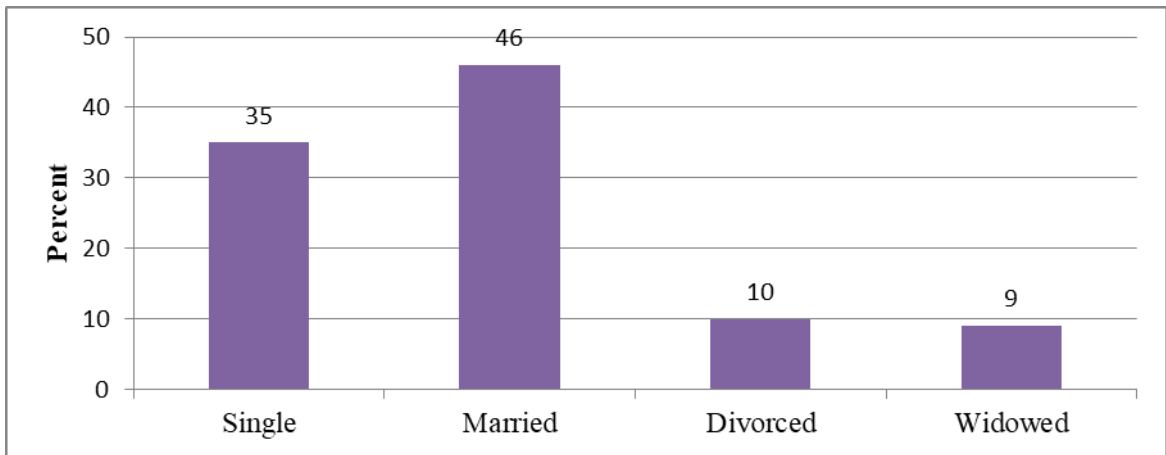


Figure 4.2: Marital Status

4.3.5 Occupation

The study sought to establish the respondents' occupation. The study findings in Figure 4.3 illustrates that 39% were in informal employment, 22% were in formal employment and 21% were unemployed. 9% of the population were retired and earning pension while 9% were retired but not earning pension. The findings imply that the respondents did not have regular form of income and thus living hand to mouth which could have attributed to them being unbanked.

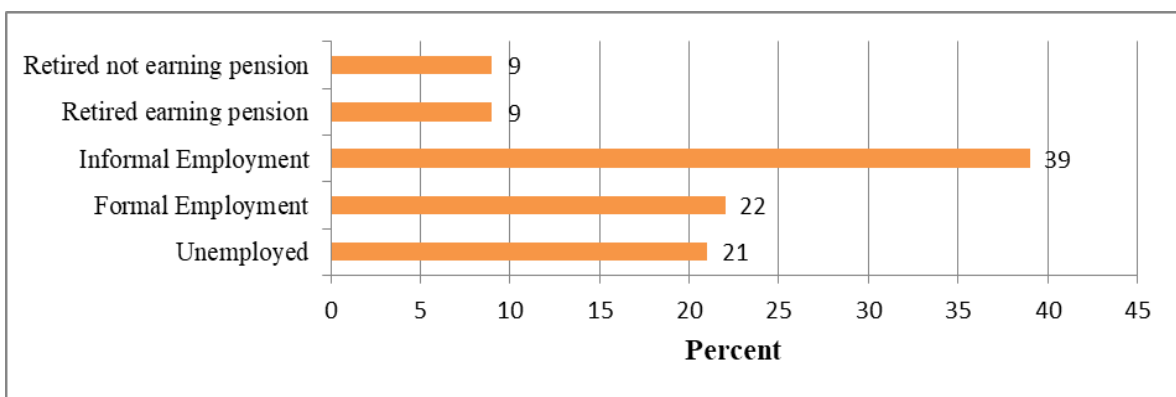


Figure 4.3: Occupation

4.3.6 Monthly Income

A total of 96 respondents (96% of the respondents) had an income level of less than Kenya Shillings (KES) 8,000. The sample of this study included people with or without a mobile phone and with or without bank account in Kenya, with an income of less than KES 8,000 per month. The results of the income level per individual per month indicated that this was the Bottom of the Pyramid (BOP) economic segment as intended by the researcher.

Table 4.5: Monthly Income

Monthly income	Frequency	Percent
Between KES 4,001 and 6,000	43	43%
Between KES 6,001 and 8,000	53	53%
Over KES 8,000	4	4%
Total	100	100%

4.3.7 Ownership of Mobile Phone

The respondents were asked to indicate whether they owned a mobile phone, Figure 4.4 indicates that 76% of the respondents owned a mobile phone and only 24% did not own a mobile phone. The findings imply that majority of the respondents had access to a mobile phone and thus could adopt mobile banking if they so desired. These results therefore provided a good foundation for this study.

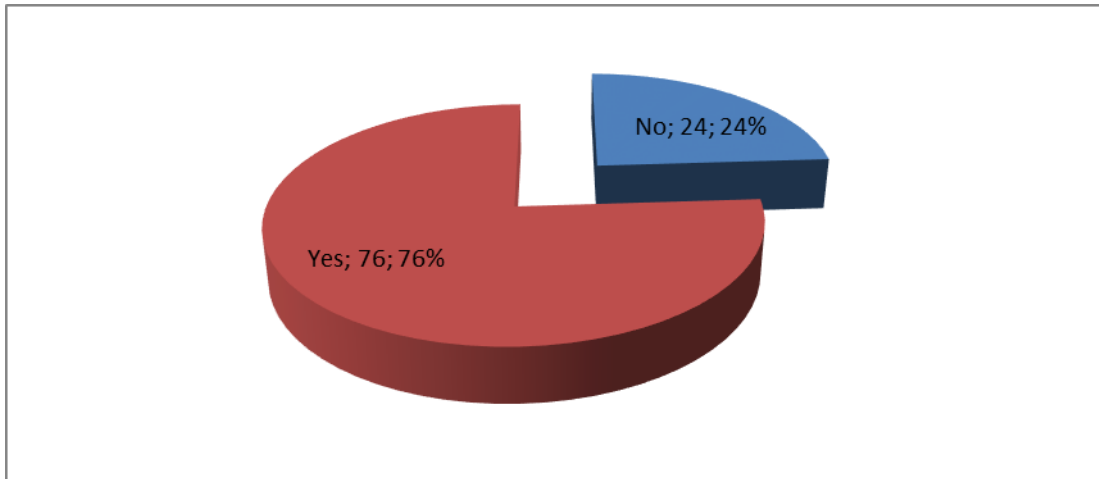


Figure 4.4: Mobile Phone Ownership

Table 4.6 shows the type of mobile phone the respondents owned. Majority (33%) indicated they had feature phones, 25% had basic phones and only 18% had smart phones. 24% of the respondents did own a mobile handset and hence the response not applicable.

Table 4.6: Type of Phone

	Frequency	Percent
Basic phone	25	25
Feature phone	33	33
Smart phone	18	18
Not Applicable	24	24
Total	100	100

4.3.8 Mode of receiving income, save money and obtain credit

The respondents were asked to indicate how they received income, saved money and how they obtained credit using the various means provided in the questionnaire. Table 4.7 shows the results from the respondents. The results indicate that majority (62%) of the respondents received their income using cash, another 62% received in kind and 58% received on the

mobile wallet. Only 19% indicated they received using a cheque. This could have attributed to the respondents being in unbanked category due to the nature of their jobs.

Similarly, on saving money majority (70%) indicated that they saved in informal chama also known as table banking, 62% indicated with the bank while 58% indicated in cash at home, 46% were saving with a sacco. Only 30% of the respondents indicated that they saved in the mobile money wallet. The findings imply that the respondents are still using the traditional way of saving money.

In regards to obtaining credit, the respondents indicated that they obtained credit from several sources such as shylock, bank, family and friends, sacco and informal chama. The highest preferred was table banking (informal chama) at 70% followed by family and friends (62%), sacco (58%), shylock (58%) and lastly from the bank (35%). The findings imply that the respondents are still using the traditional way of borrowing money.

Table 4.7: Receive Income, Save Money and Obtain Credit

Question	Options	No		Yes	
		Frequency	Percent	Frequency	Percent
How do you receive your income	In cash	38	38.0%	62	62.0%
	On mobile money wallet	42	42.0%	58	58.0%
	Using a cheque	81	81.0%	19	19.0%
	In kind	38	38.0%	62	62.0%
How do you save money	In cash at home	42	42.0%	58	58.0%
	Informal chama /Table banking	30	30.0%	70	70.0%
	On my mobile money wallet	70	70.0%	30	30.0%
	With the sacco	54	54.0%	46	46.0%
	With the bank	38	38.0%	62	62.0%
How do you obtain credit	From the shylock	42	42.0%	58	58.0%
	From the informal chama /table banking	30	30.0%	70	70.0%
	From family and friends	38	38.0%	62	62.0%
	From the sacco	42	42.0%	58	58.0%
	From the bank	65	65.0%	35	35.0%

4.3.9 Ownership of a bank account and use of mobile banking

Respondents were asked to indicate whether they owned a bank account. Responses indicated that 58% of the respondents had a bank account, the remaining 42% of the respondents did not own a bank account. See figure 4.5

Respondents were also asked to indicate whether they were users of mobile banking technology. Results indicated that 40% were users of mobile banking technology while 60% of the respondents did not use mobile banking, showing that majority of the respondents were yet to embrace the concept of mobile banking. See figure 4.5

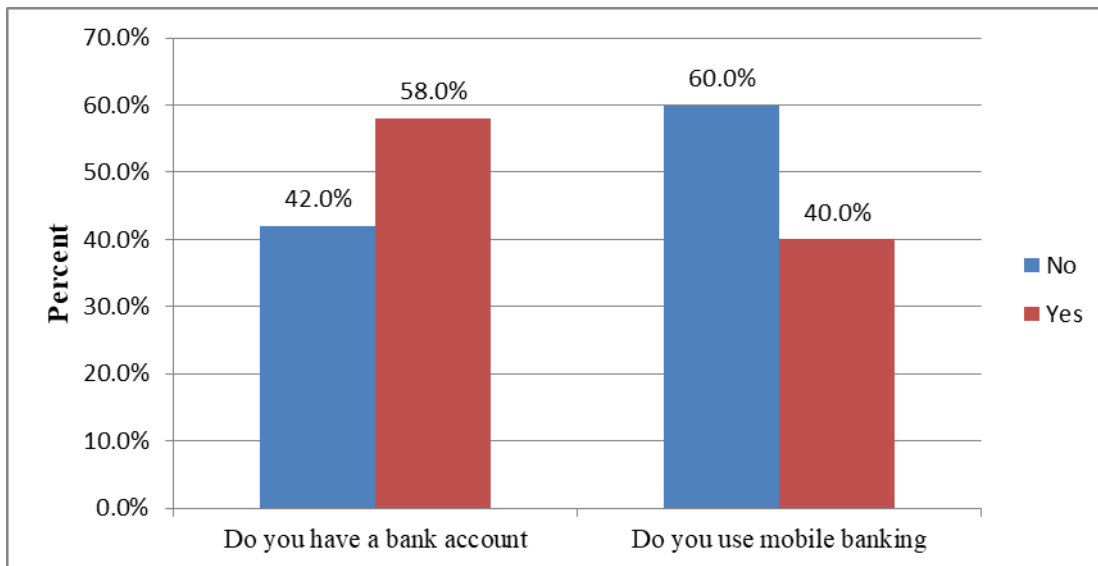


Figure 4.5: Ownership of Bank Account and use of Mobile Banking

Respondents who answered that they used mobile banking were required to provide data on the services they used on the platform .Table 4.8 below reveals that 28% indicated that they were using mobile banking to save money, 30% to obtain credit and 24% to make payments of utility bills, goods and services.

Table 4.8: Usage of Mobile Banking Services

Question	Options	No	Yes
Which mobile banking services do you use?	Payment of utility bills , goods and services	76%	24%
	Saving money	72%	28%
	Obtaining credit	70%	30%

The study sought to determine how often the mobile banking user respondents used mobile banking per week. Table 4.9 indicates that majority of the respondents being 17% used mobile banking on a need basis while 5% indicated that they used mobile banking services daily, 60% of the respondents did not respond to this question since they did not use mobile banking.

Table 4.9: Frequency of using Mobile Banking

	Frequency	Percent
Daily	5	5
Once	8	8
Three times	7	7
More than three times	3	3
Unpredictable , on need basis	17	17
Not Applicable	60	60
Total	100	100

4.4 Descriptive Statistics

In this section provides a report on the descriptive statistics for the study variables namely; adoption of mobile banking, perceived cost, perceived usefulness, perceived ease of use and perceived risk. The descriptive statistics summarize the main features of the study variables.

4.4.1 Adoption of Mobile Banking

The research investigated the adoption of mobile banking services in Kenya. Table 4.10 demonstrates that 82% of the respondents agreed with the view that mobile banking was a service that saved them time. This was because by using mobile banking, the respondents would allocate their time to accomplish other tasks as opposed to visiting and queuing at a physical bank. In addition, 84% of the respondents agreed with the view that service delivery improved when one used m-banking. This was due to the fact that the process was efficient and response was timely. 81% of the respondents concurred with the view that mobile banking allowed for service to be provided anywhere as long as there was telecom service; allowing for availability anywhere and anytime. 73% of the respondents were in agreement with the statement that mobile banking was a platform that allowed for more products and

services to be delivered whereas 77% agreed that mobile banking saved customers from lots of paper work. The aggregate mean score for adoption of mobile banking was 3.90 with a standard deviation of 1.111 which indicates that on average the respondents agreed that by adopting mobile banking would be of benefit to them. However, this also implies that there is a segment of respondents that are of the view that adopting mobile banking would not be of benefit to them. This implies that there may be other variables that affect adoption of mobile banking. These observations are in concurrence with Laukkanen and Lauronen, (2005) who opined that by adopting mobile banking customers are able to enjoy efficient, quick and convenient.

Table 4.10: Adoption of Mobile Banking

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
Mobile banking saves customer time since they no longer need to physically visit the banking hall	3%	9%	6%	40%	42%	4.09	1.055
Mobile banking services improve quality of service delivery	4%	11%	1%	66%	18%	3.83	0.985
Mobile banking provides service anywhere as long as there is telecom service	4%	7%	8%	43%	38%	4.04	1.053
Mobile banking allows for more products and services to be provided	10%	8%	9%	55%	18%	3.63	1.169
Mobile banking saves customers from lots of paper work	9%	10%	4%	36%	41%	3.9	1.291
Aggregate Score	6.00%	9.00%	5.60%	48.00%	31.40%	3.90	1.111

4.4.2 Perceived Cost

The first objective of the study was to determine whether perceived cost had an effect on adoption of m-banking for customers at the BOP. Table 4.11 demonstrates that 69% of the respondents concurred that the cost of acquiring a mobile phone was high, 71% agreed with the statement that access to mobile banking services was expensive while 89% were of the view that taxation on mobile banking was too costly and 80% of the respondents concurred with the statement that mobile banking was expensive to use. In addition, 74% had the

opinion that the bank transactions costs were high, 77% of the respondents concurred that mobile banking reduces the costs that are incurred when one uses physical banking; for example, costs such as travelling to the financial institution. The aggregate mean score for perceived cost was 3.98 and a standard deviation of 1.042. This suggests that on average respondents concurred with the statements that measured perceived cost towards adoption of mobile banking to a great extent. The results infer that cost was a key factor in deciding adoption of mobile banking. The discoveries concur with those of Luarn and Lin (2005), Chitungo & Munongo (2013) who observed perceived costs to be a critical factor affecting the adoption of m-banking for users in Taiwan and Zimbabwe. The discoveries further affirm Masinge's (2010) assertion that low pay individuals have a low buying power therefore they are highly sensitive to costs and value.

Table 4.11: Responses on Perceived Cost

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
The cost of buying phone is very high	10%	12%	9%	31%	38%	3.75	1.344
It is expensive to access mobile banking	4%	13%	12%	46%	25%	3.75	1.095
Taxation is too high on mobile banking	0%	8%	3%	40%	49%	4.30	0.87
It is expensive to use mobile banking	0%	9%	11%	51%	29%	4.00	0.876
I think the bank transaction costs are high	2%	10%	14%	32%	42%	4.02	1.073
Associated costs such as travelling to the banking hall are reduced when using mobile banking	0%	12%	11%	38%	39%	4.04	0.994
Aggregate Score	2.7%	10.7%	10.0%	39.7%	37.0%	3.98	1.042

4.4.3 Perceived Usefulness

The second objective of the study was to establish the influence of perceived usefulness on the adoption of m-banking for customers at the BOP. Results on Table 4.12 illustrates that 68% of the respondents concurred with the statement that using mobile financial services would enable them to accomplish their tasks more effectively, 72% agreed that they think that using mobile financial services would make it easy for them to carry out tasks with efficiency and another 73% of the respondents agreed that the use of mobile banking was

limited to only the literate as it required some basic literacy as well as numeracy skills. Further to that ,73% agreed that mobile banking would enable them to access financial services from any place and at any time while 64% agreed that mobile banking would allow them to make payments and 69% agreed that mobile banking would allow them to make savings. In addition only 44% of the respondents felt that mobile banking would allow them to access investment opportunities, 59% agreed that mobile banking would allow them to access credit facilities and 62% agreed that mobile banking would allow them to access insurance facilities. The aggregate mean score for this variable was 3.72 and a standard deviation of 1.274 which implies that on average the respondents agreed that perceived usefulness influenced adoption of mobile banking. The findings imply that an individual's willingness to use a particular innovation for their transactions depends on their perception of its use which amounts to perceived usefulness. The findings are in accordance with Aboelmaged & Gebba (2013), Kabir (2013), and Munir & Idrus (2013) who conducted studies in the UAE, Bangladesh and Indonesia respectively.

Table 4.12: Responses on Perceived Usefulness

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
I think that using mobile financial services would enable me to accomplish my tasks more effectively	4%	17%	11%	34%	34%	3.77	1.205
I think that using mobile financial services would make it easy for me to carry out tasks with efficiency	9%	10%	9%	37%	35%	3.79	1.274
The use of mobile banking is limited to only the literate as it requires some basic literacy as well as numeracy skills	3%	13%	11%	32%	41%	3.95	1.149
Mobile banking would enable me to access financial services from any place and at any time	1%	19%	7%	36%	37%	3.89	1.136
Mobile banking would allow me to make payments	16%	9%	11%	25%	39%	3.62	1.476
Mobile banking would allow me to make savings	7%	9%	15%	30%	39%	3.85	1.234
Mobile banking would allow me to access investment opportunities	17%	26%	13%	11%	33%	3.17	1.538
Mobile banking would allow me to access credit facilities	6%	14%	21%	32%	27%	3.60	1.198
Mobile banking would allow me to access insurance facilities	3%	18%	17%	19%	43%	3.81	1.253
Aggregate Score	7.3%	15.0%	12.8%	28.4%	36.4%	3.72	1.274

4.4.4 Perceived Ease of Use

The third objective of the study was to evaluate the influence of perceived ease of use on the adoption of m-banking for customers at the BOP. Table 4.13 demonstrates that 73% of the respondents agreed with the statement that mobile banking is easy to use, 78% agreed

with the statement that mobile banking is easy to learn and 62% agreed with the statement that interaction with mobile banking requires a lot of mental effort. 50% of the respondents agreed with the statement that mobile banking allowed them to accomplish their banking tasks easily, 72% agreed that mobile banking saves them from lots of paper work and 84% agreed that mobile banking service was comfortable to use. Finally 85% of the respondents agreed that mobile banking services were flexible; allowing one to conduct multiple services. The mean score for this variable was 3.80 with a standard deviation of 1.008 which implies that the respondents agreed to a moderate extent that perceived ease of use influences adoption of mobile banking in Kenya. This also implies that the adoption rate will only be improved if the benefits of using mobile banking are well demonstrated and the population is sensitized on the benefits. The investigation discoveries support with those of (Hamza & Shah, 2014) in Nigeria ,Munir & Idrus, 2013) in Indonesia and (Sayid, Echchabi, & Aziz, 2012) in Somalia.

Table 4.13: Responses on Perceived Ease of Use

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
I think that mobile banking is easy to use	2%	16%	9%	51%	22%	3.75	1.038
I think mobile banking is easy to learn	4%	7%	11%	49%	29%	3.92	1.022
I think that interaction with mobile banking requires a lot of mental effort.	9%	16%	13%	53%	9%	3.37	1.134
I think that mobile banking allows me to accomplish my banking tasks easily	3%	14%	33%	37%	13%	3.43	0.987
Mobile banking saves me from lots of paper work	3%	8%	17%	60%	12%	3.70	0.893
Mobile banking service is comfortable to use	2%	7%	7%	34%	50%	4.23	0.993
Mobile banking services are flexible allowing to carry out multiple services	2%	8%	5%	39%	46%	4.19	0.992
Aggregate Score	3.6%	10.9%	13.6%	46.1%	25.9%	3.80	1.008

4.4.5 Perceived Risk

The fourth objective of the study was to ascertain the influence of perceived risk on the adoption of m-banking for customers at the BOP. Table 4.14 indicates that 62% of the respondents agreed with the statement that mobile banking performance was affected by network problems, 73% agreed that they trust that the banking systems and telecom systems are accurate and 78% agreed that system errors may affect mobile banking transactions leading to loss. Furthermore, 62% of the respondents agreed that when transaction errors occur, they worry that they may not get compensation from financial service providers, 50%

agreed that fixing payment errors may lead to a waste of time and 72% agreed that they feel confident when providing sensitive personal privacy information over mobile banking systems. In addition 84% of the respondents agreed that they were concerned that other people could access their money through system hacks, 85% agreed that they trust that the banking and telcom systems would safeguard their private information and money and 62% agreed that the mobile banking systems are highly credible. The aggregate mean score for this section was 3.80 which indicated that majority of the respondents agreed with the statements that measured the perceived risk towards adoption of mobile banking. The discoveries are similar to the results from studies in Malaysia, (Cheah, Sim, Oon, and Tan, 2011), Delhi by (Singh, 2014) and UAE by (Chavali & Kumar, 2018) .

Table 4.14: Responses on Perceived Risk

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
Mobile banking performance is affected by network problems	3%	18%	17%	19%	43%	3.81	1.253
I trust that the banking systems and telecom systems are accurate	2%	16%	9%	51%	22%	3.75	1.038
System errors may affect mobile banking transactions leading to loss	4%	7%	11%	49%	29%	3.92	1.022
When transaction errors occur, I worry that I may not get compensation from financial service providers	9%	16%	13%	53%	9%	3.37	1.134
Fixing payment errors may lead to a waste of time	3%	14%	33%	37%	13%	3.43	0.987
I feel confident when providing sensitive personal privacy information over mobile banking systems	3%	8%	17%	60%	12%	3.70	0.893
I am concerned that other people could access my money through system hacks	2%	7%	7%	34%	50%	4.23	0.993
I trust that the banking and telcom systems will safeguard my private information and money	2%	8%	5%	39%	46%	4.19	0.992
The mobile banking systems are highly credible	3%	18%	17%	19%	43%	3.81	1.253
Aggregate Score	3.4%	12.4%	14.3%	40.1%	29.7%	3.80	1.063

4.5 Diagnostic Tests

Diagnostic tests were conducted on the data obtained from the research study as recommended by (Njuguna, 2013) in order to assess the assumptions of the statistical model. The tests conducted included; Normality test, Linearity test and Multicollinerity test.

4.5.1 Normality Test

The results presented in Table 4.15 show that all the variables had values between -3 and +3. Based on these, it was concluded that all the variables were normally distributed since they lie within the ± 3 range recommended by (George & Mallery, 2010) and therefore further tests could be carried out on the data.

Table 4.15: Normality Test

Variable		Statistic	Std. Error
Adoption of mobile banking	Skewness	-1.11	0.241
	Kurtosis	1.101	0.478
Perceived Cost	Skewness	-0.772	0.241
	Kurtosis	0.331	0.478
Perceived Usefulness	Skewness	-0.502	0.241
	Kurtosis	-0.136	0.478
Perceived Ease of use	Skewness	-1.446	0.241
	Kurtosis	3.04	0.478
Perceived Risk	Skewness	-1.407	0.241
	Kurtosis	3.317	0.478

4.5.2 Linearity

Pearson's correlation coefficient was used to test the linearity that exists between the independent and dependent variables of the study variables as proposed by Cohen, West and Aiken, (2003). Results of correlation often take the range between +1 and -1. Where the plus or minus sign of the correlation co-efficient indicates the direction of the relationship. This

therefore infers that a -1 indicates a perfect negative linear relationship, whereas a +1 indicates a perfect positive linear relationship and 0 indicated no relationship exists between variables. Table 4.15 shows the linearity results are below.

The findings presented in table 4.16 indicates that there is a statistically significant positive linear relationship between adoption of mobile banking and all the study's independent variables at $P < 0.05$ significance level. The results indicate that a relationship exists between the dependent and independent variables by virtue that that there is correlation between the two. However, evidence of correlation does not always mean that there is a causation relationship whereby a change in one variable leads to a change in another variable (Rohrer, 2018). Due to this fact therefore, it is paramount that the researcher conducts a regression analysis to determine whether a causal relationship exists. Since this population is normally distributed, linear regression is suitable and can be estimated in this study.

Table 4.16: Results of Pearson's Correlation Linearity Test

Variable		Adoption of mobile banking	Perceived Cost	Perceived Usefulness	Perceived Ease of use	Perceived Risk
Adoption of mobile banking	Pearson Correlation	1				
	Sig. (2-tailed)					
Perceived Cost	Pearson Correlation	.844**	1			
	Sig. (2-tailed)	0.000				
Perceived Usefulness	Pearson Correlation	.833**	.795**	1		
	Sig. (2-tailed)	0.000	0.000			
Perceived Ease of use	Pearson Correlation	.881**	.848**	.832**	1	
	Sig. (2-tailed)	0.000	0.000	0.000		
Perceived Risk	Pearson Correlation	.831**	.782**	.759**	.855**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

4.5.3 Multi-collinearity

To determine whether multi-collinearity existed, collinearity test was conducted using, tolerance, and variance correlation analysis. Multi-collinearity is a test that is used to determine whether one predictor variable can be used to determine another with a considerable amount of accuracy. Table 4.17 shows that the Variance inflation factor (VIF) for perceived cost was 4.038, perceived usefulness was 3.63, perceived ease of use was 6.221 and perceived risk was 3.934. The mean VIF for the variables is 4.456. Table 4.17 shows that the variables have a VIF that is less than 10 and tolerance value more than 0.1. This rules out

the possibility of multi-collinearity implying that there was no multi-collinearity problem among the variables. Therefore, the level of multi-collinearity in the model can be endured.

Table 4.17: Results of Multi-collinearity Test

Variable	Collinearity Statistics	
	Tolerance	VIF
Perceived Cost	0.248	4.038
Perceived Usefulness	0.276	3.630
Perceived Ease of use	0.161	6.221
Perceived Risk	0.254	3.934
Mean	0.235	4.456

Dependent Variable: Adoption of mobile banking

4.6 Regression Analysis

Regression analysis was used by the researcher to ascertain the statistical significance of the independent variables on the dependent variable. The results on Table 4.18 shows the overall model of fit summary. The value indicated as R represents the correlation between the observed values and the predictor values of the dependent variables which in this case is adoption of mobile banking. The value of R in this study is 0.915 which translated to 91.5% indicating that the combined effect of the predictor variables is a strong and positive effect. This then infers that a change in the predictor variables of will have a strong positive effect on adoption of mobile banking.

The R-square on the other hand is the co-efficient of determination that explains the proportion of variance in the dependent variable that can be predicted by the collective of independent or predictor variables. The R-square value of 0.837 demonstrates that 83.7% of the variance in adoption of mobile banking (dependent variable) can be predicted from the

combined effect of the independent variables of perceived cost, perceived risk, perceived ease of use and perceived usefulness.

The adjusted R square value attempts to give a more candid value to estimate the value of R square of the population. In this study this value was 0.830 which is translated to 83% of the variance in the dependent variable can be predicted from the joint effect of the predictor variables. The standard error of the estimate 0.29607 is the standard deviation error term .It is also commonly known as the root mean square error.

Table 4.18: Regression Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.915 ^a	0.837	0.830	0.29607

a. Predictors: (Constant), Perceived Risk, Perceived Usefulness, Perceived Cost, Perceived Ease of use

From the ANOVA table 4.19 of the linear regression analysis, the model is significant in predicting how the predictor variables of perceived cost, perceived usefulness, perceived ease of use and perceived risk collectively determine the adoption of mobile banking in Mavoko slums. The regression model achieved a high degree of fit as reflected by an R²of 0.837 (F = 121.781; P = 0.000 < 0.05). The relationship was significant at critical value (0.05) since the reported p-value (0.000) was less than the critical value. The findings imply that collectively the independent variables were statistically significant in explaining changes in adoption of mobile banking.

Table 4.19: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	42.701	4	10.675	121.781	.000
Residual	8.328	95	0.088		
Total	51.028	99			

Table 4.20 displays the regression coefficients of the independent variables. The beta coefficient is the change that is experienced in the dependent variable for every one unit of change in the independent variable.

The results revealed that perceived cost was significant in explaining adoption of mobile banking as shown in the results (B=0.242; p value =0.006). The discoveries infer that one positive unit change in perceived cost would lead to change in adoption of mobile banking at a rate of 0.242. These results agree with the results by Chitungo & Munongo (2013) , Dass and Pal (2011) who observed that cost was a significant factor in adoption of mobile banking in the population in Zimbabwe and India respectively.

Perceived usefulness and adoption of mobile banking had a positive and significant relationship as shown by the results (B=0.240; p value =0.005). This suggests one positive unit change in perceived usefulness of mobile banking would lead to a change of adoption on mobile banking at a rate of 0.24. These findings are similar to those of Aboelmaged & Gebba (2013); Masinge (2010) ; Munir & Idrus(2013); Koenig-Lewis, Palmer, & Moll (2010).

Perceived ease of use was found to be significant to adoption of mobile banking with results (B=0.418; p value 0.002). These findings illustrate that one positive unit change to the perceived ease of use of mobile banking would lead to a change in the adoption of mobile banking at a rate of 0.418. The results agree with the findings from researchers Jeong and

Yoon (2013); (Hamza & Shah, 2014) ;(Munir & Idrus, 2013) and Chitungo & Munongo (2013).

Perceived risk was found to have a significant relationship to adoption of mobile banking with results showing (B=0.224, p value =0.017).This implies that one positive unit change in perceived risk to mobile banking world lead to a change in the rate of mobile banking at the rate of 0.224.These results are similar to Singh (2014); Cheah, Sim, Oon, and Tan (2011) and Ndumba (2014) who observed that perceived risk was a major contributor to the adoption of mobile banking.

Table 4.20: Regression Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	-0.347	0.211		-1.641	0.104
Perceived Cost	0.242	0.086	0.234	2.814	0.006
Perceived Usefulness	0.240	0.083	0.227	2.87	0.005
Perceived Ease of use	0.418	0.134	0.323	3.127	0.002
Perceived Risk	0.224	0.093	0.199	2.421	0.017

4.7 Moderating effect of Demographic Factors on the Factors Influencing Adoption of Mobile Banking Services

This section illustrates the results of the analysis of the independent variable on the dependent variable before and after introducing a moderating variable. The independent variable being the factors influencing adoption of mobile banking whereas the moderating variables are gender, age and education. In order to determine the effects of the predictor variables on the dependent variables the researcher run tests including the R Square and

significance tests. The R Square and overall significance of the model were analyzed before and after introducing the moderating variable. A moderating variable once introduced in a study provides additional information in a study in the sense that there is an interaction effect on the prediction of the strength of the independent variable on the dependent variable. The interaction may lead to stronger or weaker prediction power of the predictor variable on the dependent variable.

4.7.1 Moderation effect of Gender and Factors affecting Adoption of Mobile Banking

The Table 4.21 shows the Model Summary of results of R Square before the introduction of the moderation variable to the predictor variables and after the introduction of gender as a moderating variable. In the table, Model 1 shows the regression model prior to introducing the moderating variable of gender whereas Model 2 shows the regression model after the introduction of gender as a moderating variable.

The results indicate that gender had a positive moderating effect on the combined independent variables as shown by the value of R square change of 0.024. This means that gender contributed 2.4% of the variation in adoption of mobile banking. This was significant at $p=0.042$ since $0.042 < 0.05$ thereby inferring that gender moderates the relationship between factors influencing the adoption of mobile banking and is statistically significant.

Table 4.21: Moderation Tests Using R Square and Significance Change for Gender

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.650a	0.422	0.417	0.5484	0.422	71.675	1	98	0.000
2	.668b	0.447	0.435	0.53954	0.024	4.245	1	97	0.042

a. Predictors: (Constant), Factors

b. Predictors: (Constant), Factors, Gender_Factors

The ANOVA results for factors influencing adoption of mobile banking with gender as the moderating variable in Table 4.22 indicates that the model was significant with $F=39.147$ and p value $0.000 < 0.05$. This means that factors influencing adoption of mobile banking (perceived cost, perceived usefulness, perceived ease of use and perceived risk) and gender had significant effect on adoption of mobile banking services. The model remained statistically significant with p value of $0.000 < 0.05$.

Table 4.22: ANOVA Test for Factors and Gender as a Moderator

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.556	1	21.556	71.675	0.000 ^b
	Residual	29.473	98	0.301		
	Total	51.028	99			
2	Regression	22.791	2	11.396	39.147	0.000 ^c
	Residual	28.237	97	0.291		
	Total	51.028	99			

a Dependent Variable: Adoption of mobile banking

b Predictors: (Constant), Factors

c Predictors: (Constant), Factors, Gender_Factors

Table 4.23 shows the coefficients of the regression equations for model 1 and model 2. Model 2 includes gender as a moderating variable at 95% level of confidence. The Beta

value for factors was 0.647 and 0.06 for factors*gender. This is indicative that gender moderated the relationship between the factors influencing mobile banking and adoption of mobile banking in the bottom of the pyramid populations in Kenya.

Table 4.23: Regression Coefficients for Gender as a Moderator

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.254	0.334		3.749	0.000
Factors	0.748	0.088	0.65	8.466	0.000
2 (Constant)	1.271	0.329		3.861	0.000
Factors	0.647	0.1	0.562	6.483	0.000
Gender_Factors	0.06	0.029	0.179	2.06	0.042

a Dependent Variable: Adoption of mobile banking

4.7.2 Moderation effect of Age and Factors influencing Adoption of Mobile Banking

Table 4.24 shows the results of the R-square before involving the moderating variable (age) and after incorporating the moderating variable to the independent variable (factors influencing adoption of mobile banking). When age was added to the factors the R squared change of 0.011 was observed. This means that age contributed to 1.1% of variation in adoption of mobile banking. Results show that after introducing the moderating variable of age the R- square improved from 0.422 to 0.434 and was not significant (0.17) since p value 0.17 >0.05. This means age does not moderate the relationship between factors influencing adoption of mobile banking and adoption of mobile banking.

Table 4.24: Moderation Tests Using R Square and Significance Change for Age

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.650a	0.422	0.417	0.5484	0.422	71.675	1	98	0.000
2	.658b	0.434	0.422	0.54588	0.011	1.907	1	97	0.17

a Predictors: (Constant), Factors

b Predictors: (Constant), Factors, Age_Factors

The ANOVA results for factors influencing adoption of mobile banking with age as the moderating variable in Table 4.25 indicates that the model was significant with $F=37.123$ and $p=0.000 < 0.05$ meaning that factors influencing adoption of mobile banking (perceived cost, perceived usefulness, perceived ease of use and perceived risk) and age had significant effect on adoption of mobile banking services. The model remained statistically significant with p value = $0.000 < 0.05$.

Table 4.25: ANOVA Test for Factors and Age as a Moderator

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.556	1	21.556	71.675	.000b
	Residual	29.473	98	0.301		
	Total	51.028	99			
2	Regression	22.124	2	11.062	37.123	.000c
	Residual	28.904	97	0.298		
	Total	51.028	99			

a Dependent Variable: Adoption of mobile banking

b Predictors: (Constant), Factors

c Predictors: (Constant), Factors, Age Factors

Table 4.26 shows the coefficients of the regression equations for both models. Model 1 indicates that the coefficient of factors was positive and significant. In model 2 the coefficient

of factors became positive and insignificant after moderation at 95% level of confidence. The Beta values for variables are factors was 0.719 and 0.02 for factors*age. The beta coefficient after moderation became weak and was not significant. This is indicative that age does not moderate the relationship between factors influencing adoption of mobile banking and adoption of mobile banking services in informal settlements in Kenya.

Table 4.26: Regression Coefficients for Age as a Moderator

Mode 1		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.254	0.334		3.749	0.000
	Factors	0.748	0.088	0.65	8.466	0.000
2	(Constant)	1.144	0.342		3.345	0.001
	Factors	0.719	0.09	0.625	7.949	0.000
	Age_Factors	0.02	0.014	0.109	1.381	0.170

a Dependent Variable: Adoption of mobile banking

4.7.3 Moderation effect of Education and Factors influencing Adoption of Mobile Banking

Table 4.27 shows the results of the R-square before involving the moderating variable (education) and after incorporating the moderating variable to the independent variable (factors influencing adoption of mobile banking). The results indicate that education had no moderating effect on factors (R squared change of 0). Results show that after introducing the moderating variable (education) the R square did not change from 0.422 and was not significant since $0.915 > 0.05$. This means education does not moderate the relationship between factors influencing adoption of mobile banking and adoption of mobile banking.

Table 4.27: Moderation Tests Using R Square and Significance Change for

Education

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.650a	0.422	0.417	0.5484	0.422	71.675	1	98	0.000
2	.650b	0.422	0.411	0.55119	0	0.012	1	97	0.915

a Predictors: (Constant), Factors

b Predictors: (Constant), Factors, Education_Factors

The ANOVA results for factors influencing adoption of mobile banking with education as the moderating variable in Table 4.28 indicates that the model was significant with $F=35.482$ and $p=0.000 < 0.05$ meaning that combined factors influencing adoption of mobile banking (perceived cost, perceived usefulness, perceived ease of use and perceived risk) and education had significant effect on adoption of mobile banking services. The model remained statistically significant with $p \text{ value} = 0.000 < 0.05$.

Table 4.28: ANOVA Test for Factors and Education as a Moderator

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.556	1	21.556	71.675	.000b
	Residual	29.473	98	0.301		
	Total	51.028	99			
2	Regression	21.559	2	10.78	35.482	.000c
	Residual	29.469	97	0.304		
	Total	51.028	99			

a Dependent Variable: Adoption of mobile banking

b Predictors: (Constant), Factors

c Predictors: (Constant), Factors, Education Factors

In order to determine the significance of coefficients Table 4.29 shows the coefficients of the regression equations for both models. The coefficient of factors was found to be positive and significant as per Model 1. In model 2 the coefficient of factors became negative and insignificant after moderation at 95% level of confidence. The Beta values for variables are factors was 0.746 and 0.001 for factors*education. The beta coefficient after moderation became weak and was not significant (0.915). This is indicative that education does not moderate the relationship between factors influencing adoption of mobile banking and adoption of mobile banking services in informal settlements in Kenya.

Table 4.29: Regression Co-efficients for Education as a Moderator

Mod el		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.254	0.334		3.749	0.000
	Factors	0.748	0.088	0.65	8.466	0.000
2	(Constant)	1.245	0.347		3.591	0.001
	Factors	0.746	0.09	0.649	8.293	0.000
	Education_Factors	0.001	0.013	0.008	0.107	0.915

a Dependent Variable: Adoption of mobile banking

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of main findings of the study, provides conclusions and necessary recommendations. The study aimed to establish the factors influencing adoption of mobile banking services at the Bottom of the pyramid population in Mavoko sub-county in Machakos County in Kenya. The summary is provided according to the objectives of the study based on the output of the descriptive and inferential statistical analysis guided to test the research questions and hypothesis of the study.

5.2 Summary of the Findings

This study purposes to investigate the factors that influence m-banking services adoption at the BOP. The results of the study indicated 76% of the respondents owned a mobile phone, while the remaining 24% owned none. 58% of the respondents owned a bank account while the remaining 42% of the respondents did not own a bank account. Results show that the process of adoption of mobile banking was relatively slow. As mobile banking continues to get traction in Kenya, the banking and financial technology companies should take advantage of the growth opportunity that exists at the BOP, thereby making access to financial services more inclusive. On the other hand the BOP will benefit through access of regulated services such as access to credit, payment ,saving products, insurance and risk management products, There is a population at the BOP who are uninformed of the benefits of mobile banking and therefore the mobile banking service providers should build capacity to educate this population within these communities .The education initiatives should have a key focus on

inclusion; educate on mobile banking costs , risks , ease of use, usefulness and other important factors that would influence adoption of mobile banking .

5.2.1 Perceived Cost and Adoption of Mobile Banking

In this study, the first objective was to establish the influence of perceived costs on the adoption of m-banking for customers at the BOP. The results showed that perceived cost was a significant factor in the adoption of mobile banking to the bottom of the pyramid. The part of the population that had chosen to not adopt mobile banking had perceived it to be costly whereas those who adopted mobile banking found it to be affordable. Perceived cost therefore was determined to be a barrier to adoption of m-banking.

The Pearson correlation coefficient results showed that there exists a positive and significant relationship between perceived cost and adoption of mobile banking. Results from the regression test was statistically significant in explaining adoption of mobile banking in relation to cost. These findings imply that one positive unit change in perceived cost would lead to a change in adoption of mobile banking at a rate of 0.242. The results of the study are similar to those by Masinge(2010) , Luarn and Lin (2005) , but were in contrast to the studies by Micheni *et. al* (2013) who observed that cost was not a significant factor in adoption of mobile banking.

5.2.2 Perceived Usefulness and Adoption of Mobile Banking

The second goal of the investigation was to assess the influence of perceive usefulness on the adoption of mobile banking for customers at the Bottom of the pyramid population. Perceived usefulness was defined as a perceived view individual's willingness to make use of

a particular technology and that that particular technology would of use to him (Davis, 1989). The study findings indicates that majority of the respondents were of the view that perceived usefulness influenced adoption of mobile banking. These respondents were of the opinion that using mobile banking would help them accomplish their tasks in an effective and efficient manner, allowing them to access financial services anywhere anytime.

The results further depict that once the value proposition for any technology including mobile banking is demonstrated, and customers perceive that the technology is of use to them, the adoption of the technology would occur with ease. From the results of the study, the current users of mobile banking perceived mobile banking to be of use to them. Pearson correlation coefficient demonstrated that there exists a positive and critical relationship between perceived usefulness and adoption of mobile banking. Regression results showed that perceived usefulness and adoption of mobile banking had a positive and statistically significant relationship. These results are similar to the observations made by Aboelmaged & Gebba (2013), Kabir (2013), Munir & Idrus (2013),Masinge (2010). Conversely Al-Jabri (2015) and Karma, Ibrahim, & Ali (2014) found that perceived usefulness was insignificant in adoption of mobile banking.

5.2.3 Perceived Ease of Use and Adoption of Mobile Banking

The objective of this study was to determine whether perceived ease of use had an influence on adoption of mobile banking at the Bottom of the pyramid population. Perceived ease of use is defined as the extent to which an individual believes that using a particular system, innovation or technology would be free of effort (Davis, 1989). Perceived ease of use was found to have an a great influence on mobile banking adoption.This indicated that

majority of the respondents were of the view that perceived ease of use had an influence on adoption of mobile banking.

The respondents were of the view that mobile banking required a lot of mental effort. On the other hand, they were of the opinion that mobile banking was easy to use, easy to learn as it allowed them to accomplish their banking tasks easily. The respondents were also in agreement with the view that mobile banking saved them from lots of paper work and it was comfortable to use. These results indicated that mobile banking would be easily adapted by the bottom of the pyramid if the potential customers are able to make use of the product with ease. Pearson correlation coefficient and regression results demonstrated that there exists a positive and significant relationship between perceived ease of use and adoption of mobile banking. These results were similar to those of (Hamza & Shah, 2014) in Nigeria ,Munir & Idrus, 2013) in Indonesia and (Sayid, Echchabi, & Aziz, 2012) in Somalia

5.2.4 Perceived Risk and Adoption of Mobile Banking

The fourth objective of this study was to determine whether perceived risk had an impact on the adoption of mobile banking at the bottom of the pyramid population. Perceived risk is defined as the uncertainty about the outcome arising from the use of a particular innovation or technology (Chitungo & Munongo, 2013).

In this study, perceived risk was found to have an influence on mobile banking adoption. The findings indicated that the majority of the respondents were of the view that perceived risk had an impact on the adoption of mobile banking at the bottom of the pyramid. Respondents were concerned that third parties could unlawfully access their money through system hacks and that they may not get compensation from a financial service provider

should network errors occur as system errors may lead to loss. Similarly respondents opined that fixing payment errors may lead to a waste of time. Based on these results, the findings indicate that respondents needed the providers of mobile banking to provide risk free mobile banking products or near zero risk products in order for adoption to increase.

Regression results and Pearson correlation coefficient demonstrated that there exists a positive and significant relationship between perceived risk and adoption of mobile banking. The discoveries are similar to the results from studies in Malaysia, (Cheah, Sim, Oon, and Tan, 2011), Delhi by (Singh, 2014) and UAE by (Chavali & Kumar, 2018) .

5.2.5 Moderating impact of Demographic Factors on Adoption of Mobile Banking

The fifth objective of this study was to determine whether demographic factors had a moderating effect on adoption of mobile banking for the population at the bottom of the pyramid. The demographic factors included: gender, age and education.

Results from the study indicated that gender had a positive and significant relationship between factors that had an influence on mobile banking adoption and adoption of mobile banking. This results were similar to those in Jordan by (Alafeef, Singh, & Ahmad, 2011) and (Goyal, Pandey, & Batra, 2012) in India. In contrast, age and education did not have a moderating effect, thereby agreeing with the studies from Ethiopia by (Teka, 2017).

5.3 Conclusion

The study indicates that the bottom of the pyramid population has a relatively high penetration of mobile phone use but have a low uptake of mobile banking. The results from

the study indicate that the bottom of the pyramid population views mobile banking a tool that promotes financial freedom, allows for convenience as it allows them to access more financial products and services. This aspect of the population can be leveraged by mobile banking providers to ensure that potential users understand the value proposition of mobile banking.

Results indicate that the bottom of the pyramid are generally the youth and middle aged adults with a majority of them having secondary level education. The data collected from the studies indicate that the BOP population adopts mobile banking based on all the variables that were studied i.e. perceived cost, perceived usefulness, perceived ease of use and perceived cost. All these factors were found to have a positive correlation with adoption of mobile banking technology with perceived ease of use having the highest positive correlation and therefore most statistically significant. Perceived cost was found to have the second highest positive correlation. Findings therefore infer that the bottom of the pyramid greatly values technology that is easy to use and affordable and would adopt mobile banking if it is easy to use and the benefits of adoption would outweigh the cost of the technology. Fintech companies including banks and technology companies need educate the BOP on how easy it is to navigate mobile banking technology and consider and in order to have buy-in from potential customers.

Perceived usefulness and perceived risk were also found to have a positive correlation on adoption of mobile banking. This findings indicated that those who had not adopted mobile banking perceived it to not be useful. Similarly mobile banking was perceived to be a risky undertaking. The bottom of the pyramid population would adopt mobile banking if the usefulness of mobile banking is sufficiently demonstrated and the risk is well understood.

5.4 Recommendations

Based on the findings and conclusions made, this research makes the following recommendations;

Mobile banking service providers should make mobile banking applications easy to use and easy to learn, ensuring that this service is as inclusive as possible for both the high end customers and customers sat the bottom of the pyramid. The marketing activities should include the navigation features of the mobile banking applications. Services should not only be in the form of an application but also in the form of the USSD codes (Unstructured Supplementary Service Data) .Applications are available in smart phones while the USSD codes would be available in the basic phone and feature phone as well as the smart phones.

Mobile banking service providers should endeavor to make the cost of mobile banking technology low. Low costs of technology will encourage uptake on mobile banking to the bottom of the pyramid population. Adoption of mobile banking by the bottom of the pyramid will be of benefit to both the users and the business that have this technology.

5.5 Areas for Further Research

This study concentrated at establishing factors that influence the adoption of m-banking services at the Bottom of the pyramid population but was limited to the Mavoko sub-county in Machakos County. A similar study should be done in informal settlements in poor areas within Kenya such as the Northern part of Kenya and Coastal regions and compare those with the urban poor such as those in Kenya's Capital city of Nairobi. This will be for purposes of establishing comparisons with the findings of this study.

Secondly, the study utilizes the factors from the Technology Acceptance Model (TAM) and Extended TAM; another study could use other main factors that were suggested in other relevant theories such as Unified Theory of acceptance and Usage of Technology (UTAUT).

Finally, this study suggests that following the Covid-19 pandemic, a similar study should be done on the same population in order to investigate the impact of the pandemic on mobile banking adoption on the bottom of the pyramid population.

REFERENCES

- Abayomi, O. J., Olabode, A. C., Reyad, M. H., & Teye, E. T. (2019). Effects of Demographic Factors on Customers' Mobile Banking Services Adoption in Nigeria. *International Journal of Business and Social Science, Vol 10, No. 1*, 63-77.
- Aboelimged, M., & Gebba, T. (2013). Mobile Banking Adoption: An Examination of Technology Acceptance Model and Theory of Planned Behaviour. *International Journal of Business Research and Development, Vol. 2 No. 1*, 35-50.
- Achieng, B. M., & Ingari, B. K. (October 2015). Factors Influencing the Adoption of Mobile Banking in Kenya's Commercial Banks: A Case of Kenya Commercial Bank (KCB) Kilindini Branch. *International Journal of Scientific and Research Publications, Volume 5, Issue 10*, 1-14.
- Aduda, J., Kiragu, P., & Ndwiga, J. M. (2013). The Relationship between Agency Banking and Financial Performance of Commercial Banks in Kenya. *Journal of Finance and Investment Analysis, vol. 2, no.4*, 97-117.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes, 50(2)*, 179-211.
- Aker, J., & Mbiti, I. (2010). Mobile Phones and Economic Development in Africa. *Journal of Economic Perspectives, Vol. 24, No. 3*, 207-232.
- Alafeef, M., Singh, D., & Ahmad, K. (2011). Influence of Demographic Factors on the Adoption Level of Mobile Banking Applications in Jordan. *Research Journal of Applied Sciences 6 (6)*, 373-377.
- Aldas-Manzano, J., Lassala-Navarre, C., Ruiz-Mafe, C., & Sanz-Blas, S. (2012). The role of consumer innovativeness and perceived risk in online banking usage. *International Journal of Bank Marketing, 27 (1)*, 53-75.
- Al-Jabri, I. (2015). The intention to use mobile banking: Further evidence from Saudi Arabia. *South African Journal of Business Management, 23-34*.
- Alliance for Financial Inclusion. (2019, April 28). <https://www.afi-global.or>. Retrieved from <https://www.afi-global.org/sites/default/files/publications/MFSWG%20Guideline%20Note%20on%20Terminology.pdf>
- Alliance for Financial Inclusion - AFI. (2012). *Mobile Financial Services : Regulatory Reporting*. Bangkok, Thailand: Alliance for Financial Inclusion - Mobile Financial Services Working Group (MFSWG).

- AlSoufi, A., & Ali, H. (2014). Customers perception of mbanking adoption in of Bahrain: an empirical assessment of an extended tam model. *International Journal of Managing Information Technology* , Vol.6, No.1, 1-13.
- Amin, H., Hamid, M., Lada, S., & Anis, Z. (2008). The Adoption of Mobile Banking in Malaysia : The Case of Bank Islam Malaysia Berhad (BIMB). *International Journal of Business and Society*, Vol. 9 No. 2, 43-53.
- Andiva, B. (2015). *Mobile Finacial Services and Regulation in Kenya*. 2015: Competition Authority of Kenya.
- Ayo, C., Adewoye, J., & Oni, A. (2010). The State of E-Banking Implementation in Nigeria : A Post- Consolidation Review . *Journal of Emerging Trends in Economics and Management Sciences* , Vol 1(1), 37-45.
- Babbie, E. (2001). *The Practice of Social Research. 9th Edition*. Belmont.: Wadsworth Thomson.
- Bernard, H. (2006). *Research Methods in Anthropology : Qualitative and Quantitative Approached 4th Edition* . Lanham , Maryland USA: Rowman and Littlefield Publishers, Inc .
- Castillo, J. (2009, May 29). *Population Sampling Techniques*. Retrieved from Experiment sources : <https://experiment-resources.com/populationsampling.html>
- Chavali, K., & Kumar, A. (2018). Adoption of Mobile Banking and Perceived Risk in GCC. *Banks and Bank System* , 13(1), 72-79.
- Cheah, C.-M., Teo, A. C., Jia, S. J., & Kam, H. (2011). Factors Affecting Malaysian Mobile Banking Adoption : An Empirical Analysis. *International Journal of Network and Mobile Technologies ; Vol 2, Issue 3*, 149-160.
- Chitungo, S., & Munongo, S. (2013). Extending the Technology Acceptance Model to Mobile Banking Adoption in Rural Zimbabwe. *Journal of Business Administration and Education* , Volume 3, Number 1, 51-79.
- Chogi, B. (2007). *The Impact of mobile phone technologies on medium and small enterprises : Case of Nairobi City*. Nairobi, Kenya: University of Nairobi .
- Cohen , J., Cohen, P., & West, S. (2003). *Applied Multiple Regression/Correlation Analysis For The Behavioral Sciences*. Carlifornia: Thousand Oaks.
- Cohen , L., Manion, L., & Morrison , K. (2007). *Research Methods in Education* . London ; NewYork: Routledge .
- Consultative Group to Assist the Poor (CGAP). (2006). *Mobile Phone Banking and Low Income Customers Evidence from South Africa*. Washington, DC , USA: Consultative Group to Assist the Poor (CGAP).

- Cooper, D., & Schindler, P. (2003). *Business Research Methods*. USA.
- Creswell, J. W. (2009). *Research Design : Qualitative, Quantitative and Mixed Methods Approaches*. California: SAGE Publications, Inc.
- Cull, R., Demirgüç-Kunt, A., & Lyman, T. (2012, May 8). *Financial Inclusion and Stability : What does Research Show ?* Retrieved from cgap@worldbank.org/financialinclusionstability
- Cunningham, J., & Gerrad, P. (2003). The diffusion of internet banking among Singapore consumers. *International Journal of Bank Marketing*, 21(1), 16-28.
- Dass, R., & Pal, S. (2011). *Exploring the Factors Affecting The Adoption of Mobile Financial Services Among the Rural Under-Banked*. India: Indian Institute of Management Ahmedabad.
- Daud, N. M., Kassim, N. E., Said, W. S., & Noor, M. M. (2011). Determining critical success factors of mobile banking adoption in Malaysia. *Australian Journal of Basic and Applied Sciences*, 5(9), 252-265.
- Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Technology*, Vol 13, 314-340.
- Dawson, C. (2002). *Practical Research Methods : A user friendly guide to mastering research techniques and projects*. United Kingdom: How to Books Ltd.
- Demirguc-Kunt, A., Klapper, L., Singer, D., & Van, P. O. (2014). *Measuring Financial Inclusion around the World, Policy Research Working Paper 7255*. Washington D.C, U.S.A: World Bank.
- Ensor, B., Montez, T., & Wannemacher, P. (2012). *State of Mobile Banking*. USA: Forrester Research.
- Featherman, M. S., & Pavlou, P. A. (2002). Predicting E-services Adoption :A Perceived Risk Assets Perspective. *Eighth Americas Conference on Information Systems*, (pp. 1034-1046). Dallas, Texas.
- Financial Sector Deepening (FSD). (2016, February 18). <http://fsdkenya.org>. Retrieved from <http://fsdkenya.org>: <http://fsdkenya.org/news/kenya-witnesses-50-increase-in-financial-inclusion-in-last-decade/>
- Financial Sector Deepening, FSD Kenya. (2016). *The Growth of M-Shwari in Kenya – A Market Development Story*. Nairobi: Financial Sector Deepening, FSD Kenya.
- Financial Sector Deepening Kenya - FSD. (2019). *2019 FinAccess Household Survey*. Nairobi: Financial Sector Deepening Kenya.

- Financial Sector Deepening Kenya - FSD . (2009). *Supporting the Development of Inclusive Financial Markets in Kenya* . Nairobi , Kenya: FSD Annual Report.
- George, , D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th ed.)*. Boston: Allyn & Bacon.
- Global System Mobile Association (GSMA). (2014). *State of the Industry : Mobile Financial Services for the Unbanked*. London , U.K: Global System Mobile Association (GSMA).
- Global System Money Association (GSMA). (2009). *Mobile Money for the Unbanked*. London , U.K: Global System Money Association .
- Goyal, V., Pandey, D., & Batra, S. (2012). Bankng in India : Practices, Challenges and Security Issues. *International Journal of Advanced Trends in Computer Science and Engineering* , Vol 1 , No. 2, 56-66.
- Grewal, D., Gotlieb, J., & Marmorstein , H. (1994). he Moderating Effects of Message Framing and Source Credibility on the Price-Perceived Risk Relationship,. *Journal of Consumer Research* 21, 145-153.
- Hamza, A., & Shah, A. (2014). Gender and Mobile Payment System Adoption among students of Tertiary Institutions in Nigeria. *International Journal of Computer and Information Technology* , Vol 3 , Issue 1, 2014.
- Hanning, A., & Shah, A. (2010). *Financial Inclusion and financial stablity*. Tokyo , Japan: Asian Development Bank Institute (ADB) Working paper series.
- Hosseini, D. H., Fatemifar, A., & Rahimzadeh, M. (2015). Effective Factors of the Adoption of Mobile Banking Services by Customers. *Kuwait Chapter of Arabian Journal of Business and Management Review*, Vol 4, No. 6.
- International Finance corporation (IFC). (2011). *Financial Inclusion Data : Assessing the Landscape and Country Level Target Approaches*. WashingtonD.C: International Finance corporation.
- International Finance Corporation (IFC). (2014). *Access to Finance*. Washington D.C , USA: International Finance Corporation .
- Ivatury, G., & Mas, I. (2008). *The Early expirience with branchless banking: Note 46* . . Washington, D.C: Consultative Group to Assist the Poor (CGAP).
- James , E., Joe, W., & Chadwick, C. (2001). Organisational Research : Determining Appropriate Sample Size in Survey Research. *Information Technology, Learning and Performance Journal* , 43-50.
- Jeong, B.-K., & Yoon, T. (2013). An Empirical Investigation on Consumer Acceptance of Mobile Banking Services. *Business and Management Research*, Vol. 2, No. 1, 31-40.

- Johnson, P. (1959). The Journal of Experimental Education. *Journal of Experimental Education* 27, 167-176.
- Johnson, S., Brown, G., & Fouillet, C. (2012). *Corporate Governance and Bank Performance in Nigeria* . University of Stellenbosch.
- Kabir, M. R. (2013). Factors Influencing the Usage of Mobile Banking Incident from a Developing Country. *World Review of Business Research Vol. 3. No. 3.*, 96 – 114.
- Karma, N. G., Ibrahim, D. B., & Ali, D. H. (2014). Key Factors Affecting Mobile Banking Adoption Among Bank's Customers in Sudan. *International Journal of Liberal Arts and Social Science , Vol 2, No. 6*, 112-122.
- Kenya Bureau of Statistics. (2015). *Kajiado County Statistical Abstract*. Nairobi: Kenya Bureau of Statistics.
- Kenya National Bureau of Statistics. (2013). *Exploring Kenya's Inequality - Pulling apart or pooling together - Kajiado county*. Nairobi: Kenya National Bureau of Statistics.
- Kenya National Bureau of Statistics. (December 2019). *2019 Kenya Population and Housing Census :Volume II Distribution of Population by Administrative Units*. Nairobi: Kenya National Bureau of Statistics.
- Kenya Slum Upgrading Programme (KENSUP) . (2013). *Kenya Slum Upgrading Programme*. Nairobi: UN-Habitat.
- Kenya Vision 2030. (2007). *Vision 2030*. Nairobi, Kenya: Government of Kenya .
- Khan, S. N., Akter, M., & Akter, R. (2017). Factors Influencing Adoption and Usage of Mobile Banking: Bangladesh Experience. *International Journal of Finance and Banking Research*, 1-12.
- Kimenyi, S., & Ndung'u, S. (2009). *Expanding the Financial Services Frontier : Lessons from Mobile Banking in Kenya*. Nairobi , Kenya.
- Koenig-Lewis, N., Palmer, A., & Moll, A. (2010). Predicting young consumers' take up of mobile banking services". *International Journal of bank marketing*, 28 (5) , , 410-432.
- Kothari , C. (2004). *Research Methodology : Methods & Techniques 2nd Edition* . New Delhi, India : New Age International Publishers .
- Kumar, L., Balasubramanian, ., G., & Subramanian, R. (2012). *Technology, Financial Inclusion and Securities Markets NSE-IMFR*. Retrieved from https://www.nseindia.com/research/content/NSE-IFMR_Paper_3.pdf:
https://www.nseindia.com/research/content/NSE-IFMR_Paper_3.pdf
- Lacobucci , D., & Churchill, G. (2005). *Marketing Research : Methodological Foundations 9th Edition*. Mason, Ohio: Thomson South Western .

- Laukkanen , T., & Lauronen, J. (2005). Consumer value creation in Mobile Banking Services. *International Journal of Mobile Communication Vol 3, No. 4*, 325-338.
- Lee, M. (2009). Factors Influencing the Adoption of Internet Banking : An Integration of TAM and TPB with Perceived Risk and Perceived Benefit. *Electronic Commerce Research and Applications* , 8(3), 130-141.
- Levene, H. (1960). Robust testes for equality of variances . *In Contributions to Probability and Statistics (I. Olkin, ed.)*, 278–292.
- Li, J., Liu, J., & Ji., H. (2014). Empirical Study of Influence Factors of Adaption Intention of Mon=bile Payment based on TAM Model in China. *International Journal of U and E-Service, Science and Technology* 7(1), 119-132.
- Li, L. (2010). *A critical review of Technology Acceptance of Literature : A Reffered Research Paper*. Los Angeles , USA: Grambling State University.
- Luarn , P., & Lin, H. (2005). Toward an Understanding of the Behaviour Intention to Use Mobile Banking . *Computers in Human Behaviour*, 873-891.
- Luo, X., Li, H., Zhang, ., J., & Shim, J. (2010). Examining Multi-dimensional Trust and Multi-faceted Risk in Initial Acceptance of Emerging Technologies: An Empirical Study of Mobile Banking Services. *Decision Support Systems*, 49(2), 222-234.
- Maimbo. (2010). *Influence of Service Quality Differenciation Strategy on Customer Loyalty in Commercial Banks within Nakuru County*. Nakuru, Kenya: (Unpublished MBA project) at Egerton University, Njoro.
- Malik, K. (2014). *Human Development Report 2014 - Sustaining Human Progress : Reducing Vulnerabilities and Building Resilience*. New York: UNDP.
- Mari, S. (2003). <https://jyu.fi/dspace/handle/123456789/13203#>. Retrieved from <https://jyu.fi/dspace/handle/123456789/13203#>
- Mari, S., & Minna, M. (2004). Mobile Banking and Consumer Behaviour : Insights into the Diffusion Pattern. *Journal of Finacial Services Marketing* , Vol 5(4), 354-366.
- Mas, L., & Radcliffe, D. (2011). *Mobile Payments go Viral : M-Pesa in Kenya*. USA: Bill and Melinda Gates Foundation .
- Masinge, K. (2010). *Factors influencing the Adoption of Mobile Banking Services at the Bottom of The Pyramid in South Africa*. Pretoria, South Africa: A research roprt submitted to the Gordon Institute of Business Science - University of Pretoria.
- Micheni, E., Lule, I., & Muketha, G. (2013). Transaction Costs and Facilitating Conditions as Indicators of the Adoption of Mobile Money Services in Kenya. *International Journal of Advanced Trends in Computer Science and Engineering (IJATCSE)*; Vol.2 , No.5 , 09-15.

- Mugenda, O., & Mugenda, A. (2003). *Research Methods :Quantitative and Qualitative Approaches*. 2003: Nairobi Center for Technology Studies.
- Munir, A., & Idrus, M. (2013). Acceptance of Mobile Banking Services in Makassar: A Technology Acceptance Model (TAM) Approach. *Journal of Business and Management (IOSR-JBM)*, Volume 7, Issue 6, 52-59.
- Muthiora, B. (2015). *Enabling Mobile Money Policies in Kenya Fostering a Digital Financial Revolution*. Nairobi, Kenya: Global System Mobile Association.
- Myoung, B. (2009). *Micro-Econometrics for Policy, Program and Treatment Effects*. In *OUP Catalogue.RePE*. Oxford : Oxford University Press.
- Ndumba. (2014). *Factors affecting adoption of mobile banking in Kenya; case study of Kenya commercial bank Limuru*. Limuru , Kenya : Unpublished .
- Ngechu, M. (2004). *Understanding the research process and methods. An introduction to research methods*. Nairobi : Acts Press.
- Njuguna, K. (2013). *Strategic Social Marketing, operating environment and performance of Community Based HIV and AIDS organization in Nairobi County, Kenya - Published Ph.D Thesis*,. Nairobi: University of Nairobi.
- Nunnally, J. C. (1978). *Psychometric theory (2nd ed.)*. New York: McGraw-Hill.
- Omwansa, T., Waema, T., & Lule, I. (2012). Application of Technology Acceptance Model (TAM)in M-banking Adoption in Kenya. *International Journal of Computing and ICT Research , IV (1)*, 31-43.
- Ontunya , P. ((2006),). *A survey of consumer adoption of mobile phone banking in Kenya*. Nairobi: unpublished MBA project. University of Nairobi.
- Opilli, E., & Muturi, D. (2016). Factors Influencing the Use of Mobile Banking in Kenya, the Case of M-KESHO in Bungoma County. *International Journal of Management and Commerce Innovations , Vol. 3, Issue 2, , 149-154*.
- Oxfam Interanational. (2017, December 6). <https://www.oxfam.org/en/even-it/kenya-extreme-inequality-numbers>. Retrieved August 26, 2018, from <https://www.oxfam.org:https://www.oxfam.org/en/even-it/kenya-extreme-inequality-numbers>
- Pitta, D., Guesalaga , R., & Marshall, P. (2008). The quest for the Fortune at the Bottom of The Pyramid. *Journal of Consumer Marketing*, 25 (7), 393-401.
- Porteous, D. (2006). *The Enabling Environment for Mobile Banking in Africa*. Boston , USA: Department for International Development - DFID , Vol 3.1.
- Porteous, D. (2007). *Making Finacial Markets work for the Poor* . Johannesburg ,South Africa: FinMark Trust.

- Porteous, D. (2016). Consolidating Africa's Mobile Banking Revolution. *Global Economic Governance Programme* (pp. 22-24). Oxford , U.K: Blavatnik School of Government.
- Prahalad, C. (2005). *The Fortune at the Base of the Pyramid : Eradicating poverty through profits - Enabling dignity and choice through markets* . Philadelphia , U.S.A: Wharton School Publishing.
- PricewaterhouseCoopers (PwC). (2016, November). *Shifting trends in the microfinance ecosystem*. New Delhi , India: PricewaterhouseCoopers.
- Programme, U. N. (2017). *Human Development Index*. New York: United Nations Development Programme .
- Quan, S., Hao, C., & Jianxin, Y. (2010). Factors Influencing Adoption of Mobile Service in China : An Intergration of TAM. *Journal of Computers*, 799-806.
- Ramdhony, D., & Munien, S. (2013). An Investigation of Mobile Banking Adoption and Usage : A case study of Mauritius. *World Journal of Social Sciences*, Vol. 3 , No. 3, 197- 217.
- Riquelme, H., & Rios, , R. (2010). The moderating effect of gender in the adoption of mobile banking. *The International Journal of Bank Marketing*, vol. 28, no. 5., 328-341.
- Rogers, E. (1999). *Diffusion of Innovations (4th Ed.)*. New York, U.S.A: The Free Press.
- Rogers, E. M. (2003). *Diffusion of innovations (5th Edition)*. New York: Free Press.
- Rohrer, J. M. (2018). Thinking Clearly About Correlations and Causation: Graphical Causal Models for Observational Data. *Advances in Methods and Practices in Psychological Science*.
- Safaricom PLC. (2019, April 28). <https://www.safaricom.co.ke>. Retrieved from Safaricom PLC official website: <https://www.safaricom.co.ke/personal/m-pesa>
- Saleem, Z., & Rashid, K. (2011). Relationship Between Customer Satisfaction and Mobile Banking Adoption in Pakistan . *International Journal of Trade , Economics and Finance* , Vol 2, No. 2, 537-544.
- Sayid, O., Echchabi, A., & Aziz, H. (2012). Investigating Mobile Money Acceptance in Somalia: An Empirical Study. *Pak. J. Commer. Soc. Sci.* 2012 Vol. 6 (2), 269-281.
- Shende, A., & Upagade, V. (2013). *Research Methodology* . India: S. Chand & Company Ltd.
- Singh, S. (2014). The Impact and Adoption of Mobile Banking in Delhi . *International Research Journal of Business and Management – IRJBM ; Volume No – I*, 19-31.

- Sripalawat, J., Thongmak, A., & Ngramyarn, A. (2011). M-Banking in Metropolitan Bangkok and a comparison with other countries. *Journal of Computer Information Systems* , 51(3), 67-76.
- Suoranta, M. (2003). *Adoption of Mobile Banking in Finland*. Jyväskylä , Finland: University of Jyväskylä.
- Tchouassi, G. (2012). Can Mobile Phones Really Work to Extend Banking Services to the Unbanked? Empirical Lessons from Selected Sub-Saharan Countries. *International Journal of Developing Societies* , Vol 1, No. 2, 70-81.
- Teka, B. M. (2017). Influence of Demographic Factors on Users' Adoption of Electronic Banking in Ethiopia. *Journal of Internet Banking and Commerce* , Vol 22 , No. S7, 2-17.
- The World Bank. (2014). *The Global Finance Development Report*. Washington D.C: Green Press Initiative Publishers.
- Thusi, P., & Maduku, D. K. (2019). Dimensions of perceived risk of mobile banking apps : An empirical investigation of South African retail banking customers . *Proceedings of 4th International Conference on the Internet, Cyber Security and Information Systems 2019* (pp. Volume 12 , 342-359). Johannesburg: Kapla Publications in Computing .
- Timothy, K. K. (2012). *Factors affecting Adoption of Mobile Phone Banking by Customers of Commercial Banks In Kenya - Unpublished Report for Masters Program -MBA*. Nairobi: University of Nairobi - School of Business .
- Tobbin, P. (2010). Modeling Adoption of Mobile Money Transfer : A Consumer Behaviour Analysis. *Conference on Mobile Communication Technology for Development (The 2nd International* (pp. 1-11). Kampala, Uganda: Aalborg University.
- UN-Habitat. (2012). *Evaluation of the Sustainable Neighbourhood Programme in Mavoko Municipality, Kenya*. Nairobi: United Nations Human Settlements Programme (UN-Habitat) .
- United Nations . (2019, April 28). [http://data.un.org/Glossary.aspx?q=Gross+capital+formation+\(%25+of+GDP\)](http://data.un.org/Glossary.aspx?q=Gross+capital+formation+(%25+of+GDP)). Retrieved from [http://data.un.org/Glossary.aspx?q=Gross+capital+formation+\(%25+of+GDP\): 2019](http://data.un.org/Glossary.aspx?q=Gross+capital+formation+(%25+of+GDP): 2019)
- Venkatesh, V., & Davis, F. (2000). A theoretical extension of the technology acceptance model : Four longitudinal field studies . *Management Science* (46), 186-204.
- Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly* , Vol. 27, 425-478.
- World Bank . (2014). *Global Financial Development Report : Financial Inclusion*. Washington D.C , U.S.A: Green Press Initiative.

- World Bank . (2017, May 22). <http://ufa.worldbank.org>. Retrieved from <http://ufa.worldbank.org>: <http://ufa.worldbank.org/country-progress/kenya>
- World Bank. (2015). *WB Update Says 10 countries move up in income bracket*. Washington D.C , U.S.A: World Bank.
- World Bank. (2017, April 5). <http://www.worldbank.org>. Retrieved from <http://www.worldbank.org>: <http://www.worldbank.org/en/topic/financialinclusion/overview>
- World Bank. (2017, May 22). <http://www.worldbank.org/>. Retrieved from <http://www.worldbank.org/>: <http://www.worldbank.org/en/programs/globalindex/infographics/infographic-global-index-2014-sub-saharan-africa>
- World Economic Forum. (2017). *The Inclusive Growth and Development Report*. Geneva , Switzerland: World Economic Forum.
- Wu, J., & Wang, S. (2005). What Drives Mobile Commerce : An empirical evaluation of the revised technology acceptance model. *Information and Management* , 42 (5), 719-729.
- Wunsch, D., & Gades , R. (1986). Survey Research : Determining Sample Size and Representative Response and The Effects of omputer Use on Keyboarding Technique and Skill. *Business Education Forum Vol 40 ; no.5*, 31-36.
- Yu, C. (2012). Factors Affecting Individuals to Adopt Mobile Banking : Empirical Evidence from UTAUT Model. *Journal of Electronic Commerce Reserch* , 13(2), 104-121.
- Zikmund , G., & Babin, B. (2007). *Exploring Marketing Research 9th Edition* . USA.
- Zikmund , G., Babin, B., Carr, C., & Griffin, M. (2010). *Business Research Methods 8th Edition* . Thomson South Western ,USA: Cengage Learning .

APPENDICES

Appendix I: Introduction Letter

KCA UNIVERSITY,

P.O BOX 56808 – 00200 NAIROBI,

EMAIL: elizabeth.kamunyu@gmail.com

DATE: 01-05-2019

Dear Respondent,

RE: VOLUNTARY PARTICIPATION IN RESEARCH DATA COLLECTION

My name is Elizabeth Nyawira Kamunyu a Masters student at KCA University. I am currently conducting a research study on ‘Factors Influencing Adoption of Mobile Banking Services at the Informal Settlements in Mavoko Sub-County, Kenya

In order to collect data, I have attached a questionnaire herein and I am glad to inform you that you have been randomly selected as one of the respondents in this study. Your participation is entirely voluntary. I therefore request you to kindly facilitate the collection of the required data by answering the questions in this questionnaire truthfully.

The information collected will be used solely for research purposes. All your responses will be anonymous and will be handled with confidentiality. Your participation in this study will be highly appreciated.

Thank you for taking time to complete the questionnaire attached herein.

Yours sincerely,

Elizabeth Nyawira Kamunyu – Mobile no. 0721414710

Registration Number : 15/05840

Appendix II: Questionnaire

This Questionnaire is aimed at seeking facts and information about you as a respondent and how various factors affect adoption to mobile banking. You have been selected to participate in the study. Please answer the questions by ticking or filling on the space provided.

SECTION 1: GENERAL INFORMATION

1. Please indicate your gender
 - a) Female []
 - b) Male []

2. Please indicate your age category
 - a) 18 – 25 years []
 - b) 26 – 35 years []
 - c) 36 - 45 years []
 - d) 46 – 55 years []
 - e) 56 - 60 []
 - f) Above 60 years []

3. Please indicate your highest educational qualification
 - a) None []
 - b) Primary level []
 - c) Secondary level []
 - d) Certificate level []
 - e) Diploma level []
 - f) Bachelor's Degree level []

g) Post graduate []

4. Please indicate your marital status

a) Single []

b) Married []

c) Divorced []

d) Widowed []

5. Please indicate your occupation

a) Unemployed []

b) Formal Employment []

c) Informal Employment []

d) Retired earning pension []

e) Retired not earning pension []

6. Please specify your monthly income (KES)

a) Below KES 2,000 []

b) Between KES 2,001 and 4,000 []

c) Between KES 4,001 and 6,000 []

d) Between KES 6,001 and 8,000 []

e) Over KES 8,000 []

7. Do you own a mobile phone? Yes [] No []

8. What type of mobile phone do you own?

a) Basic phone []

b) Feature phone []

c) Smart phone []

9. How do you receive your income? (**Tick all applicable options**)

- a) In cash []
- d) On mobile money wallet []
- e) Using a cheque []
- a) In kind []

10. How do you save money? **(Tick all applicable options)**

- a) In cash at home []
- b) Informal chama /Table banking []
- c) On my mobile money wallet []
- d) With the sacco []
- e) With the bank []

11. How do you obtain credit ? **(Tick all applicable options)**

- b) From the shylock []
- c) From the chama /table banking []
- d) From family and friends []
- e) From the sacco []
- f) From the bank []

12. Do you have a bank account? Yes [] No []

13. Do you use mobile banking? Yes [] No []

14. If 'yes' to question 13 above, which mobile banking services do you use? **(Tick all applicable options)**

- a) Payment of utility bills , goods and services []
- b) Saving money []
- c) Obtaining credit []
- d) Obtain insurance []
- e) Making investments []
- f) Not applicable []

15. How often do you use mobile banking per week?

- a) Daily []
- b) Once []
- c) Twice []
- d) Three times []
- e) More than three times []
- f) Unpredictable , on need basis []

SECTION 2: ADOPTION OF MOBILE BANKING

This section has statements regarding adoption of mobile banking services in Kenya. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes using a tick (√) giving ONLY one response per statement. **Rate your response on a scale where 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree**

	Statement	1	2	3	4	5
2.1	Mobile banking saves customer time since they no longer need to physically visit the banking hall					
2.2	Mobile banking services are improve quality of service delivery					
2.3	Mobile banking provides service anywhere as long as there is telecom service					
2.4	Mobile banking allows for more products and services to be provided					
2.5	Mobile banking saves customers from lots of paper work					

SECTION 3: PERCEIVED COST

Please indicate your agreement with the following statements on perceived cost of mobile banking. Please tick as appropriate in the boxes using a tick (√) giving **ONLY** one response per statement. **The rating is as follows: 1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree**

	Statement	1	2	3	4	5
3.1	The cost of buying phone is very high					
3.2	It is expensive to access mobile banking					
3.3	Taxation is too high on mobile banking					

3.4	It is expensive to use mobile banking					
3.5	I think the bank transaction costs are high					
3.6	Associated costs such as travelling to the banking hall are reduced when using mobile banking					

SECTION 4: PERCEIVED USEFULNESS

Please indicate your agreement with the following statements on perceived usefulness of mobile banking. Please tick as appropriate in the boxes using a tick (√) giving **ONLY** one response per statement. **The rating is as follows: 1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree**

	Statement	1	2	3	4	5
4.1	I think that using mobile financial services would enable me to accomplish my tasks more effectively					
4.2	I think that using mobile financial services would make it easy for me to carry out tasks with efficiency					
4.3	The use of mobile banking is limited to only the literate as it requires some basic literacy as well as numeracy skills					
4.4	Mobile banking would enable me to access financial services from any place and at any time					
4.5	Mobile banking would allow me to make payments					
4.6	Mobile banking would allow me to make savings					
4.7	Mobile banking would allow me to access investment opportunities					
4.8	Mobile banking would allow me to access credit facilities					
4.9	Mobile banking would allow me to access insurance facilities					

SECTION 5: PERCEIVED EASE OF USE

Please indicate your agreement with the following statements on perceived ease of use of mobile banking. Please tick as appropriate in the boxes using a tick (√) giving **ONLY** one response per statement. **The rating is as follows: 1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree**

	Statement	1	2	3	4	5
5.1	I think that mobile banking is easy to use					

5.2	I think mobile banking is easy to learn					
5.3	I think that interaction with mobile banking requires a lot of mental effort.					
5.3	I think that mobile banking allows me to accomplish my banking tasks easily					
5.4	Mobile banking saves me from lots of paper work					
5.5	Mobile banking service is comfortable to use					
5.6	Mobile banking services are flexible allowing to carry out multiple services					

SECTION 6: PERCEIVED RISK

Please indicate your agreement with the following statements on perceived risk on mobile banking. Please tick as appropriate in the boxes using a **tick (√)** giving **ONLY** one response per statement **The rating is as follows: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree**

	Statement	1	2	3	4	5
6.1	Mobile banking performance is affected by network problems					
6.2	I trust that the banking systems and telecom systems are accurate					
6.2	System errors may affect mobile banking transactions leading to loss					
6.3	When transaction errors occur, I worry that I may not get compensation from financial service providers					
6.4	Fixing payment errors may lead to a waste of time					
6.5	I feel confident when providing sensitive personal privacy information over mobile banking systems					
6.6	I am concerned that other people could access my money through system hacks					
6.7	I trust that the banking and telcom systems will safeguard my private information and money					

6.8	The mobile banking systems are highly credible					
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'Thank you for taking your time to complete this questionnaire'

Appendix III : Sample Frame - List of informal settlements in Mavoko Sub-county

1. Bondeni slums
2. Bridge 39 slums
3. Chalenzi slums
4. City Carton slums
5. Jam city slums
6. Jua Kali slums
7. Jinguini slums
8. Kaanani slums
9. Kasuitu slums
10. Kinanie slums
11. Kisumu Ndogo slums
12. Kijiji slums
13. KMC slums
14. Kwambemba slums
15. Kwa Mang'eli slums
16. Ndovoini slums
17. Makadara slums
18. Slota slums
19. Sofia slums
20. Old town slums

Appendix IV : Study Work Plan

Activity	Month 1				Month 2				Month 3				Month 4			
	Week				Week				Week				Week			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Topic selection & approval	■															
Appointment with supervisor		■														
Draft proposal production			■	■												
Incorporate the reviews from supervisor				■	■	■	■									
Correction of draft proposal from supervisor							■	■								
Submission to panel and incorporation of panel comments									■	■	■					
Questionnaire pilot testing											■					
Collection of data												■	■			
Processing and analysis of data														■		
Review of draft by supervisor															■	■
Incorporate supervisor comments															■	■
Submit project to board of postgraduate studies																■

Appendix V: Estimated Research Budget

	Task/activity	Cost (Kes)	Cost description & justification
1	Questionnaire printing & photocopying	1,500.00	150 copies of questionnaire at Kes.10
2	Questionnaire pilot testing	5,000.00	1 research assistant at Kes. 1,000 per day for 5 days
3	Printing and binding costs for proposal and thesis reports	10,000.00	5 copies of 150 pages thesis at Kes.10 page including binding
4	Local travel costs for data collection	10,000.00	For 2 research assistants
5	Contingency budget	10,000.00	To cater for any unprecedented research activities that may present themselves
6	Data collection costs	20,000.00	2 research assistants at Kes.10,000 each
	Total	56,500.00	

END