ST. MARY'S UNIVERSITY,

SCHOOL OF GRADUATE STUDIES

BARRIERS TO ADOPTION OF MOBILE BANKING:

THE CASE OF PRIVATE AND GOVERNMENT BANK CUSTOMERS' IN ADDIS ABABA, ETHIOPIA

BY :

BRIKTY G.GIORGIS

ID.NO. SGS/0145/2007B

January, 2017

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A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY COLLEGE, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (GENERAL MBA)

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APPROVED BY BOARD OF EXAMINERS

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 Graduate Studies   Signature

Zemenu Aynadis (Asst.Prof)
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Advisor   Signature

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External Examiner   Signature

Declaration

I, Brikty G.Giorgis, hereby declare that the thesis entitled ***Barriers to Adoption of Mobile banking: (The case of private and government bank customers' in Addis Ababa, Ethiopia)*** is the outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged. This study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the requirement for the Master of business administration (MBA) program.

Name: **Brikty G.Giorgis**   *Signature* _____

St. Mary's University College, Add is Ababa   **January, 2017**

ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

Zemenu Aynadis (Asst.Prof)

_____   _____

Advisor   Signature

St. Mary's University College, Addis Ababa   **January, 2017**

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Brikty G.Giorgis

List of Abbreviations and Acronyms used

- (TAM)Technology Acceptance Model
- (IDT) Innovation Diffusion Theory
- (M-bank) service mobile bank service
- (ICT) Information and Communication Technologies
- (e-Banking)-Electronic banking
- (SMS) short message service
- (ATM) automatic teller machines
- (USSD), Unstructured Supplementary Service Data
- (MPIN) Mobile Banking, Personal Identification Number
- (WAP) Wireless Access Protocol
- (PIN) Personal Identification Number

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ABSTRACT

The purpose of this research is to investigate the perceived barriers to adoption of mobile banking among consumers in Addis Ababa Ethiopia , and to assess whether the usage of M-Banking is constraint on the basis of different demographic characteristics such as age, income level, mobile phone usage "experience" and marital status. The study tries to build on two widely used models for technology adoption, the Technology Acceptance Model (TAM) and Innovation Diffusion Theory (IDT) and to identify factors influencing customer's usage of mobile banking Although millions of dollars have been spent on building mobile banking systems, reports on mobile banking show that potential users may not be using the systems, despite their availability. Thus, research is needed to identify the factors determining users' acceptance of mobile banking. While there has been considerable research on the technology acceptance model (TAM) that predicts whether individuals will accept and voluntarily use information systems. A research model uses the TAM model and IDT model by integrating perceived risk, trust and awareness into the established models. This study was conducted based on the data gathered from customers of Awash international bank, Dashen bank, commercial bank of Ethiopia, Wegagen bank share company, bank of Abyssinia, Nib International Bank, Lion International Bank and, Adis international Bank in Addis Ababa, Ethiopia. Data were collected using convenient sampling via self-administered questionnaire in a in the city of Addis Ababa .A total of 384 survey questioners' 320 usable responses were collected from users and non-users of mobile banking and retained for analysis using SPSS version 23. The research results found, perceived trust in the M-bank service emerged as the most significant factor that impacts on the adoption of m-bank service following, perceived usefulness, awareness and perceived ease of use as major influencing factors for mobile banking adoption whereas Perceived self-efficacy were found to have insignificant effect on mobile banking usage for bank customers located in Addis Ababa, Ethiopia. The study recommended banks to consider investing in security and in arranging campaigns information sessions to demonstrate the features of mobile banking services, and its benefits over traditional channels.

Keywords: *Mobile banking Usage, TAM, financial services, marketing strategy, Addis Abab*

CHAPTER ONE; INTRODUCTION

This chapter indicates the set up basis of the current research. A general background of the study is provided as an introduction in order to describe the area in which the study is conducted and further on, justify the importance of the specific research in terms of objectives, significance, scope and limitations along with research problem and the structure of the paper

1.1 Introduction/Background

During the past few years, there have been tremendous transformations observed in the financial service industry. Rapid changes in the banking environment increased the competition by new players from the non-banking sector, product innovation, globalization and technological advancement that in turn led to a market situation in which the battle to attract customers become intense. As a consequence, banks have started to offer new services through various delivery channels. In the name of increased customer satisfaction and efficiency, they have developed innovative service products and offered a wider range of services (Mari,2003). The delivery of multi-channel services forms a part of these efforts. One step in achieving the goal of the banks is the provision of banking services through electronic delivery channels. Although the traditional, branch-based retail banking remains the most widespread method of conducting banking transactions in Ethiopia and other countries as well.

Among the newest services offered is a wireless delivery channel. With banking services being available via mobile phones along with wireless technology is rapidly changing the way personal financial services are designed and delivered. In recent times, many banking customers are developing an unwillingness to visit traditional branches and are becoming less loyal to a specific bank and savvier in their demand for convenient services (Luo, Li, Zhang& Shim, 2010, p. 222; Coelho & Easing wood, 2003, p. 23). The success of a bank in the current environment rests on its ability to provide innovative products and services that seek to address the evolving needs of customers and to further explore ways of maintaining a competitive advantage that clearly differentiates them from their competitors (Coetzee, van Zyl&Tait, 2013, p. 2).

Mobile Banking (M-Banking) is one of the emerging Information and Communication Technologies (ICT) element that has changed the operations of the banking sector. Banks are eagerly introducing various forms of SMS services for communication and transaction purposes. M-Banking refers to the execution of financial services using mobile communication techniques together with mobile devices (ITU, 2011). Banks are introducing M-Banking in order to take advantage of high mobile phone penetration around the world and more specifically in Africa (Tiwari&Buse, 2007). The simplicity of using mobile phones to send and receive money and make payments anywhere has the potential in helping to making Ghana's economy a cashless one. The wider acceptance and usage of M-Banking can enhance business and economic growth through mobile commerce promotion, enhancing individual, business and national productivity as a whole.

Tobbin (2012) has shown the adoption of mobile banking services can greatly widen the market reach of financial services to the poor and rural population in Africa. In Ghana, eleven out of twenty nine licensed banks have introduced M-Banking as additional product in their quest to capture large market share from both banked and unbanked Ghanaian population.

Similarly Iddris (2013), investigated the Barriers to Adoption of Mobile banking in Ghana, the result indicates that majority of respondents do not use mobile banking service mainly because M-banking requires knowledge and learning, it attracts additional banking charges, poor telecommunication network, and consumer preference for traditional means of banking instead of mobile enabled banking services.

A recent study by Maduku (2014), in the South African perspective confirmed trust in the e-banking system, customer awareness of e-banking services and perceived self-efficacy, together with the Technology acceptance model (TAM) constructs of perceived usefulness and ease to use contribute significantly to internet and cellphone banking adoption and use. In this study, customers' trust in the e-banking system was also found to be the strongest predicator of Internet and cellphone banking services adoption.

Since 2013, commercial banks in Ethiopia have tried to introduce mobile banking systems to improve their operations and reduce costs. As of June 30, 2016 there are 1,178,861 internet

banking users and 342,528M-banking users in Ethiopia while as of June 30, 2015 the number of mobile bank users was 526,455 (NBE,2016 E-payment department report).

Looking at the data it can be said that despite all the efforts aimed at developing better and easier mobile banking systems, these systems can easily remain unnoticed by customers, or are seriously under-used. Clearly, mobile banking services form an important innovation in the banking sector, and it is mobile banking as a phenomenon which is under investigation in the present research. Ethiopia's five-year Growth and Transformation Plan (GTP) envisages increasing the number of fixed line subscribers from 1 million in 2009/10 to 3.1 million by the end of 2014/15. The number of mobile-telephone subscribers is expected to pick up to 40 million from 6.5 million. Similarly, the number of internet users will increase to 3.7 million from 187,000 by the end of the plan period. In 2013/14, the number of mobile subscribers surged by 19.2 percent and reached 28.3 million from 23.8 million a year before. Meanwhile, the number of internet subscribers surged by 39.2 percent on annual basis and reached 6.2 million from 4.4 million recorded (NBE, 2013/14 Annual Report).Therefore, from this we can learn that there is a potential mobile banking users for the future so, that's why this research is very important.

1.2 Statement of the Problem

New technologies create new markets and opportunities for the banking sector, and thus managing and satisfying the customers in this new banking environment has become a key issue for the players in the industry (Jayawardhena and Foley 2000). Thus, now the question is all about how to select and exploit new forms of technology in the right way and at the right time so that the banks can compete successfully. Developing new processes without having their returns threatened as a result of wasteful expenditure signifying that bank managers must be progressively aware of the opportunities that come with technological change. In order to rise to these challenges, service providers are finding it ever more vital to improve their understanding of consumer behavior patterns in banking, and consumers' adoption of new banking technology.

At the present time, we all are witnessing a revolution regarding wireless technology and mobile communication which are an emerging information technology that makes "anytime-to any place "communication possible. As a result, in order to exploit these opportunities, companies in

various industries have rapidly begun to integrate the mobile communication technologies into their business models, and the financial services sector is no exception (Yen and Chou 2000).

In the financial services industry, the major changes brought about by developments in information technology involve particularly the link between consumers and firms, and the generation of new service products (Devlin and Wright 1995). Undoubtedly, there has been a reshaping of the behavioral patterns that exist between consumers and their financial institutions. Today, customers can easily access and obtain information on different suppliers' of banking services and hence make comparisons, and one might expect customer loyalty to diminish as a consequence. However, consumers are all the time becoming more technologically aware, and their distrust of technological innovation may be lessening. All in all, one can say that the infusion of new technologies into the services sector is ubiquitous, and that it will continue to increase (Bitner et al. 2000).

Ethiopian banks are investing substantially in the provision of e-banking services for their customers as similar trend has been seen internationally as well. The ready adoption of M-banking services by customers will enable banks to realize returns on their investment while providing them with a competitive advantage. However, the rapid adoption of M-banking services is still in question. Available Ethiopian studies emphasize that retail banks are facing significant challenges in migrating customers from over-the-counter services to e-banking services(Afework Gugsa, 2015, p. 12; Gardachew Worku, 2010,P.6). In spite of this, little research has been done to investigate the determinants of M-banking adoption and use in Ethiopia. Consequently, an understanding of the factors that stand-in the adoption and use of M-banking services from the customers' viewpoint is necessary to promote rapid acceptance of the service. As a result, the focus of this study is to examine the main barriers of M-Banking adoption among customer of selected private and government banks in Ethiopia, Addis Ababa.

1.3 Basic Research Questions

Following the problem of the study, the research questions under this study will be as follows;

✓ What are the main barriers of M-Banking adoption among customers in Addis Ababa?

✓ How do the following variables influence the adoption of mobile banking: (marital status, age, and gender of the respondents and number of years 'experience' of using mobile phone?

1.4 General objectives

The general objectives of the study will be to examine the main barriers of M-Banking adoption among customer of private and government banks in Addis Ababa Ethiopia.

1.4.1 Specific objectives

On the basis of the literature review, the specific objectives of the study will be to:

- To ascertain customer perceptions of M-banking services in terms of perceived usefulness, ease of use, trust in mobile banking systems, perceived self-efficacy and customer awareness of M-banking services among customers' in Addis Ababa.
- Study the factors that affect the adoption of M-Banking service among customers' in Addis Ababa.
- Identify if the income level, marital status, and age of the respondents number of years of mobile phone usage, influence M-Banking service adoption.

1.5 Research hypothesis

The study hypothesizes the following, which are derived from the specific objectives and will be tested in this study;

H 1 The greater the perceived usefulness of using mobile banking services, the more likely that mobile banking will be adopted.

H 2 The lower the perceived complexity of using mobile banking services, the more likely that mobile banking will be adopted.

H 3 The lower the perceived risk of using mobile banking services, the more likely that mobile banking will be adopted.

H 4 The greater the perceived compatibility of mobile banking with one's values, the more likely that mobile banking will be adopted.

H 5 The greater the Customer awareness of mobile banking services, the more likely that mobile banking will be adopted

H 6 A Individual differences in number of years 'experience' of using mobile phone will have an effect on adoption of mobile banking services in terms of technology perceptions and

H 6 B Individual differences will have an effect on adoption of mobile banking services in terms of demographics defined as:

      1) gender, 2) age, 3) marital status, 4) household income

1.6 Definition of Terms

Conceptual definition of terms:

Electronic banking (e-Banking)-can be defined in various ways. In this study it is referred as the provision of information and services by a bank to its customers via electronic wired or wireless channels, for example Internet, telephone, mobile phone or interactive television (Daniel 1999).

Mobile banking (M-banking); - In this thesis M-Banking is taken to involve the use of a traditional banking service via a mobile device (e.g. account balance inquiry), but not, for example the use of mobile devices for instant payment of vending machine items.

Short Codes-Banks and financial service organization have two basic options for providing mobile services. Smartphone users can download dedicated apps to conduct banking transactions. The other option is to provide service through short message service (SMS) text message technology. It is well known that, text messaging is still widely popular, even with people who use smartphones. Many mobile financial services make use of short codes for sending SMS texts. A short code works like a telephone number, except that itis only 5 or 6 characters long and easier to remember

Warless communication (Wi-Fi); Also called (for "wireless fidelity), meaning transmitting voice grade signals or digital data over wireless communication channels. Wi-Fi creates wireless Ethernet network using access hubs and receiver cards in

personal computers, cellphones, and in any hand held devices including cellphones and similar wireless devices in to cordless multi-function "web appliances"

technology acceptance model (TAM)- that predicts whether individuals will accept and voluntarily use information systems, limitations of the TAM include the omission of an important trust-based construct in the context of electronic/mobile commerce, and the assumption that there are no barriers preventing an individual from using an information system if he or she chooses to do so (perceived usefulness, ease of use, trust in mobile banking systems, perceived self-efficacy and customer awareness of M-banking services).

Innovation Diffusion Theory; and their constructs TAM was first introduced by Fred Davis in 1989 to predict user acceptance of new technologies. According to (Davis 1989), TAM suggests that perceived usefulness and perceived ease of use are the two most important factors in explaining individual users' adoption intentions and actual usage

1.7 Significance of the Problem/Study

Academicians and businesses have a strong believe that M-Banking can take off in the foreseeable future, however consumer perceived certain barriers that need to be overcome (Laukkanen & Kiviniemi, 2010). The range of services and transactions that can be undertaken using mobile device is likely to increase, and mobile phones are likely to evolve as ubiquitous payment devices (Wilcox, 2009a). While on the other hand in Ethiopia big volume customers have not adopted M- banking to any great extent while the technology was introduction in Ethiopia since 2013. For instance ,looking at some data's as of June 30, 2016 there are a total of 3,606,387 debit card holders in Ethiopia doing annual transaction of 14,826,904.64 Birr withdrawal and transfer over ATMS (number of transaction 10, 439,429.50) in similar manner there are 1,178,861 internet banking users and 342,528 mobile banking users in Ethiopia (NBE ,2016 E-payment department report).

Therefore the study assists the banks in Ethiopia in shading some light concerning the main barriers of M-banking adoption among customers of banks in Addis Ababa so that to overcome the potential M-Banking barriers and helps the banks to generate wider acceptance of delivery of banking services through mobile digital device that leads to reducing cost of transaction and improved competitiveness ultimately increase profit. Moreover, this service delivery channel is

seen as powerful because it can retain current Web-based customers who continue using banking services from any location that defiantly provides the banks an opportunity to develop their market by attracting a new customer base from existing Internet users in Addis Ababa area.

Additionally, the study also focuses on assessing whether the usage of M-Banking is a constraint for different demographic characteristics, such as age, income level, and marital status and mobile phone usage "experience". By explaining users' intentions from a user's perspective, the findings of this research can help the bank authorities in their quest for developing the right marketing strategies for users of universal electronic device like mobile phone and develop a more user-accepted mobile banking system, but then again can also expected to provide insight into the best way to promote the technology to potential users.

1.8 Delimitation/Scope of the Study

Every piece of research has its limitations, and the limitations of this study arise from its relatively narrow research focus. It does not attempt to propose a model that would be fully comprehensive or universally applicable. Rather, it should be viewed to some extent as a preliminary insight into the relatively unexamined and unknown territory of mobile banking. The research focus will be almost entirely on the consumer. It should also be noted that the study examined mobile banking only in Ethiopia. Caution must be considered in regard to the generalize ability of this study to the application of results across country.

Another point to take into consideration will be methodologically speaking; the present research will apply a cross-sectional descriptive research: to examine the main barriers of M-Banking adoption among customer of private and government banks in Addis Ababa Ethiopia. Moreover, it assesses whether the usage of M-Banking is a constraint on the basis of different demographic characteristics, such as age, income level, marital status and mobile phone usage "experience "of customers in Addis Ababa. No doubt a better understanding may be gained concerning the strength of association between the variables if a more rigorous statistical analysis had been used, for example, using structural equation modeling**.**

1.9 Organization of the Research Report

The study will be organized in to five chapters.

Chapter one is introductory part that covers background of the study, statement of the problem, research question, objective of the study, significance of the study, Delimitation (Scope) of the study, Research Design and Methodology, Limitation and organization of the study.

The second chapter is review of related literature, enabling to develop the document and logically sequenced rational of problem.

Chapter three will include the type and design of the study; the participant of the study; the sources of data; the data collection tools/instruments employed; the procedures of data collection; and the methods of data analysis to be used.

Chapter four will provides results and discussion, which summarize the results/findings of the study, and interpret and/or discuss the findings while the last chapter, chapter five provides the summary, conclusions and recommendations of the study.

CHAPTER TWO; REVIEW OF RELATED LITERATURE

To gain a better understanding the basic terminology of mobile banking and background of mobile banking technology, this chapter presents a theoretical review with an aim to provide relevant literature in the subject area. Furthermore, the chosen theory , Technology Acceptance framework and Innovation Diffusion Theory and their constructs which includes perceived usefulness, perceived ease of use, relative advantage, compatibility along with other specific factors that are identified as influential factors of mobile banking such as perceived risk, perceived trust and awareness are discussed to develop a research model to help investigate factors influencing usage of mobile banking in Addis Ababa, Ethiopia are assessed and used to develop the hypothesized framework.

2.1 Definition of Mobile Banking

Mobile banking is an application of mobile commerce which enables customers to access bank accounts through mobile devices to conduct and complete bank-related transactions such as balancing cheques, checking account statuses, transferring money and selling stocks (Kim et al. 2009; Tiwari & Stephan 2007). Luo, Li, Zhang and Shim (2010), defined mobile banking as an innovative method for accessing banking services via a channel whereby the customer interacts with a bank using a mobile phone.

Mobile banking also means performing banking activities which primarily consist of opening and maintaining mobile/regular accounts and accepting deposits; furthermore, it includes performing fund transfer or cash-in and cash-out services using mobile devices (NBE Directive, FIS-01-2012). In the broader sense mobile banking enables the execution of financial services in the course of which - within an electronic procedure the customer uses mobile communication techniques in conjunction with mobile devices (Pousttchi and Schurig 2004 as cited in Singh 2011).

Mobile Banking can perform various functions like mini statement, checking of account history, SMS alerts, access to card statement, balance check, mobile recharge etc. via mobile phones (Vinayagamoorthy and Sankar 2012) Banks are constantly updating their

technology and want to increase their customer base by reaching to each and every customer. There are many advantages of using mobile banking, such as people in the rural or remote areas can also get an easy access to mobile banking whenever required. Mobile banking is a developing mobile technique that has combined information technology and commerce applications together. Since mobile banking was introduced, consumers have been able to use it to obtain special services 24 hours a day without having to visit the traditional bank branch for personal transactions.

2.1 Background of Mobile Banking Technology

Currently, the advancement of mobile technologies has provided an opportunity for financial providers in introducing new financial innovations. One of the emerging financial innovations introduced by financial providers in an effort to increase customer satisfaction and efficiency is mobile banking.

More recent developments in Information Communication Technology (ICT) have provided the opportunity for customers to access banking services without necessarily going to the bank branches. This technological development has intensified in recent years and has led to the reduction of financial institutions' costs (Mari 2003; Saleem and Rashid 2011).

Customers will be able to obtain immediate and interactive banking services anytime and anywhere which, in turn, initiate great value for them (Mallat et al. 2004). Mobile banking service can also increase the amount of data processing and improve operational performance. Moreover, adoption of mobile banking has significant impact on reducing costs and facilitating change in retail banking (Laukkanen and Lauronen 2005). Cruz et al. (2010) and Dasgupta et al. (2011) stated that mobile banking has great potential to provide reliable services to people living in remote areas where internet facility is limited.

Mobile banking "helps banks to increase speed, shorten processing periods, improve the flexibility of business transactions and reduce costs associated with having personnel serve customers physically" (Ayo, Adewoye and Oni 2010). The use of mobile phones has facilitated the expansion of markets, social business, and public services in both developing and developed countries (Spence and Smith 2010). Lin (2011) claims that rapid advances in mobile technologies have made mobile banking increasingly important in financial services. The use of mobile banking offers a way of lowering the cost of moving money from place to place (Donner and Tellez 2008; Anyasi and Otubu 2009).

Porteous (2006) classified mobile banking into two; firstly, transformational mobile banking, which is the provision of banking services using a mobile phone to reach the unbanked population. Secondly, additive mobile banking, in which the mobile phone is simply an additional channel that is used to provide banking services to those already banked.

This opens a whole new world of opportunities for businesses and retailers to market their goods and services for customer. Customers today are 'on-the-go' they appreciate things that are readily available to them and banking is one example. Gone are the days when customers would line up in banks to do their banking needs. Today by a touch of a button using electronic banking they can transfer funds to and from their accounts. However, even though mobile technology is widely available amongst customers, there are proportionately few adopters for mobile banking (Deloitte 2010).

2.2 Mobile Banking In Ethiopian Banking Industry

The electronic banking service was ushered into the Ethiopian market in 2001 when the largest state owned, Commercial Bank of Ethiopia (CBE) introduced ATM to deliver service to the local users (Gardachew 2010).

After this the electronic banking service scope was further expanded to mobile banking when Dashen Bank signed an agreement with iVery, a South African E-payment technology company, for the introduction of mobile commerce in April 21, 2009. According to the agreement, iVery Payment Technologies has licensed its Gateway and MiCard E-payment processing solution to Dashen Bank. Dashen's Modbirr users can transfer 500 birr to other Modbirr users in 24 hours a day. This would make Dashen Bank the first private bank in Ethiopia to acquire E-commerce and mobile merchant transactions (Amanyehun 2011).

However, mobile banking came into full practice after several years of trials and errors as well as wait-and-see attitude by customers. Since then, mobile banking has shown a gradual growth across many various parts of Ethiopia.

Despite the very high mobile penetration rate, the use and adoption of mobile banking services remains low. With the advent of new mobile technologies, such as Blackberry, iphone, Androids, etc, which serves as a catalyst, mobile banking is on the edge to draw millions of new users

Within the world teeming population (Agwu 2012). Many customers who are tired of the old banking systems are looking for time saving alternatives. The review of the existing literature showed that mobile banking has been widely researched in the developed and emerging economies; however, there is no research for the developing Ethiopian economy. This research is therefore believed to fill this gap.

2.3 Benefits of Mobile Banking

Mobile banking allows anytime, anywhere (within the network coverage) banking with all the inherent advantages (Pousttchi & Schurig 2007). The high penetration of mobile phones across the strata of society makes it a natural tool for taking electronic banking to its next level. It is more than likely that Internet banking and mobile banking would exist as allies rather than competitors for each other.

Convenience is one of the benefits of mobile banking as banking transactions and other related activities can be performed in the comfort of customer's home or offices.

The usefulness of conducting banking transactions at home or from the office eliminates the difficulties that are associated with driving to the bank, the cost of petrol, and parking. Mobile banking also allows customers to perform banking transactions 24 hours a day, 7 days a week, and 365 days a year (Eckhardt, et al 2009).

2.3.1 Benefits of Mobile Banking to Banks

Banks can utilize the time saved by the channel migration of customers to mobile banking for expansion of business through better marketing and sales activities. Mobile banking enables banks to reduce cost of courier, communication, paper works, etc and also it reduces costs in setting up a branch and the resources to process transactions (Sunil and Durga 2013). Also banks providing mobile banking services can have competitive advantage over those banks, which are not providing this service. It has also been found to increases customer loyalty that is using mobile banking customers need not to go in banks branches for fund transfer or for information, which creates a good relationship between banks and customers which helps in increasing loyalty towards the banks. Goswami and Raghavendran (2009) point out, mobile banking services will enable banks to not only increase fee-based income but also enable significant cost savings, improve service quality and provide cross-selling opportunities.

2.3.2 Benefits of Mobile Banking for Customers

Customers don't need to stand at the bank counter for various enquiries about their account. Customers can save their valuable time and travelling cost in reaching the bank for their financial transactions (Sunil and Durga 2013). Customers can pay their utility bills on time and save themselves from paying penalties, since alerts are received from the bank.

Ubiquitous access, convenience and mobility are the main benefits that mobile banking confers to customer (Laforet and Li 2005). Delport (2010) points out that with mobile banking customers no longer need to use scarce time and resources to travel to bank branches. Nevertheless, despite the widespread proliferation of mobile phones and the numerous advantages that mobile banking offers, mobile banking is still not widely adopted (Riquelme and Rios 2010).

2.4 Services Available On Mobile Banking

Mobile Banking, as defined above, includes a wide range of services. According to (Tiwari & Stephan 2007) these services may be categorized as follows:

2.4.1 Mobile Accounting

Tiwari & Stephan (2007) defined mobile accounting as transaction-based banking services that revolve around a standard bank account and are conducted and/or availed by mobile devices. Not all mobile accounting services are however necessarily transaction based. Mobile accounting services may be divided into two categories to differentiate between services that are essential to operate an account and services that are essential to administer an account (Renju 2014). Moreover, additional services are required that inform a customer about his/her transactions and other activities involving their account. It is for this reason that Mobile Accounting is offered almost regularly in combination with services from the field of Mobile Financial Information.

2.4.1.1 Account Operation

The term Account Operation, as used in this study, refers to an activity that involves monetary transactions. Such transactions may involve an external account and/or internal account. Mobile services that are used to operate an account are (Tiwari & Stephan 2007).

➢ **Money remittances**: - Mobile devices may be used to instruct the bank to remit money in order to conduct one-time transactions, such as paying bills or transferring funds. This service can also include the facility to cancel an ordered remittance.

➢ **Issue standing orders**: - The house bank may be entrusted with standing orders for payment of regularly recurring payments such as payment of standing payments, monthly rent or telephone bill.

➢ **Transfer funds to and from sub-accounts**: - Funds from one sub-account may be transferred to another as and when needed, for instance from a savings account to checking or other types of account and vice versa (Sunil and Durga 2013).

➢ **Subscribing insurance policies**: - Standardized, low-cost insurance policies like travel insurance policy may be purchased via mobile devices. This service could be particularly attractive in time-critical situations, for instance, if a bank customer has to set out on an urgent, unplanned journey, he may still be able to subscribe to a travel insurance policy offered by his house bank.

2.4.1.2 Account Administration

The term Account Administration refers to tactical situations, for instance, if a bank customer has to set out on an urgent, unplanned journey, he may still be able to subscribe to a travel insurance policy offered by his house bank. This may involve activities like access administration and cheque book request. Mobile Accounting services that are used to administer the account are (Tiwari & Stephan 2007), (Sunil and Durga 2013):

➢ **Access administration**: - Mobile devices may be used to administer the access to an account, for example to change the individual PIN or to request new transaction numbers.

➢ **Change operative accounts**: - Through this service a customer can change his default operative account and do transactions using a different account. This option is attractive for customers holding several sub accounts. Funds of sub-accounts may be hereby utilized in a targeted manner without first transferring the amount to the default account.

➢ **Blocking lost cards**: - Mobile non-voice telecommunication systems such as Wireless Application Protocol, Short Message Service (WAP, SMS) can be used round the clock to speedily block lost credit and debit cards irrespective of the current geographic location.

➢ **Cheque book request**: - Instead of going personally to the bank, the customer can request for a cheque book to be mailed to his or her address as per the records of the bank. This saves his/ her valuable time (Sunil and Durga 2013).

➢ **Bill Payment: -** for those companies which register with the bank for this service, the payment is made on request on mobile phone banking.

➢ **Change of Primary Account**: - the customer has the option to change the primary account to another new account number for carrying out transactions (Sunil and Durga 2013).

2.5.2 Mobile Financial Information

Mobile Financial information refers to non-transaction based banking- and financial services of informational nature (Tiwari & Stephan 2007). This sub-application may be divided into two categories: Account information and Market information (Cruz et al. 2010).

2.5.2.1 Account Information

The term Account Information refers to information that is specific to a customer and his bank, even though it does not necessarily involve a monetary transaction. Mobile services that belong to this category are:

➢ **Balance inquiries**: - mobile devices may be employed to check the current financial status of own bank or securities accounts (Sunil and Durga 2013).

➢ **List of latest transactions**: - mobile devices may be used to request a list of the latest transactions performed on an account. This service works with a standard, pre-specified number of latest transactions that are reported, as and when demanded. Most of the banks provide a list of transactions.

Statement request: - unlike the request for a list of latest transactions, it generates a list of all transactions in a given period, for instance in a week or in a month. Statements may be requested

either manually, as and when needed electronically. With Mobile Banking the account statements can be requested via and/or delivered on mobile devices (Cruz et al. 2010).

Transaction and balances: - the bank may be instructed to automatically alert the customer via SMS whenever transactions (credits as well as debits) exceeding a certain amount are performed on the account. In addition, a similar threshold alert may be activated for the balance status of the account. The customer may be informed via SMS whenever the balance falls below a certain predefined level. This service may be useful to help the customer avoid unpleasant situations by not being able to honor his commitments (Cruz et al. 2010).

➢ **Threshold alerts for stock prices**: - the bank may be instructed to send an alert on mobile devices, via SMS, when prices of some particular stocks fall or jump to a predefined threshold value and ask for further instructions (Suoranta and Matila 2004).

➢ **Returned cheques or cheque status**: - the customer may be informed without time delay if one of her or his deposited cheques has not been honored and corrective steps are required.

➢ **Credit card information**: - the customer may check anytime and anywhere the current status of his credit cards and the amount that he may utilize at that given point of time.

➢ **Branch and ATM locations**: - mobile devices may help finding the nearest branch or ATM affiliated with a bank. The current location of the customer may be determined by positioning the mobile device. This service may be particularly useful while travelling (Crosman 2011).

➢ **Helpline and emergency contact**: - mobile devices may be provided with content that is required in emergency situations, for instance to block a lost credit card and cheque book. The information may be either embedded in the telephone menu, for example in cooperation with a network carrier or the information may be provided on a WAP page analogue to a web page.

➢ **Information on the completion statutes of an order: -** the bank may use "push" services to inform the customer via his mobile device regarding whether or not his orders could be carried out. This ensures that urgent information can be provided to the customer while on the move.

➢ **Product information and offers: -** the bank can provide information about its products and new offers to a customer on the move. A customer can "pull" the information that he wishes to access. On the other hand the bank can "push" the information or offers that the customer has identified as interesting and is willing to receive.

2.5.2.2 Market Information

The term Market Information as opposed to Account Information refers to information with a macro scope. This information is not directly related to the customer account. It is generated either externally like exchange rates or central bank's interest rates, or internally by the individual bank (Tiwari & Stephan 2007), for example bank-specific interest rates. The individual bank customer does not play a direct role in this process. The information may be later sorted out to cater the individual needs and preferences of a particular customer, if so desired by him, and subsequently delivered to a mobile device of his choice, or a PDA. Information in this category generally concerns: Foreign exchange rates, interest rates, Stock market news and reports and Commodity prices (For example: - Gold and raw materials)

2.6 Technologies Employed to Provide Mobile Banking Services

Customers can use mobile banking technologies for various banking services ranging from planning to pay their bills via their cell phones. Mobile technologies used in the mobile banking include the browser-based applications, messaging-based applications and client-based applications (Kim et al. 2009; Tiwari & Buse 2007).

2.6.1 SMS (Short Message Service)

On the messaging-based applications, the communication between the bank and the customer is carried out via text messages. For example, by using a registered mobile number, the customer sends a predefined command to the bank, and then uses text messages to conduct transactions with the bank. An example of messaging-based applications is the Unstructured Supplementary Service Data (USSD), which has compatibility with most mobile phones. Existing mobile banking applications based on USSD includes WIZZIT in South Africa (WIZZIT 2005), M-PESA in Tanzania (Camner & Sjöblom 2009), M-PESA in South Africa (Nedbank 2010b) and FNB mobile banking (FNB 2010).

The term "SMS Banking" refers to the provision of banking and financial services via means of text messaging service, known as SMS. SMS allows the financial institutions to communicate with their customers. Almost all mobile phones have the ability to use SMS; SMS is so suitable for sending messages from banks for a number of banking operations. In order to create a query, the customer sends an SMS containing the service request to a special number which is considered for this purpose.

The customer sends a customized SMS (a command based instructed with Arabic number) to the bank with the predefined commands for each offered service. The server of the bank receives the SMS, interprets the commands and executes commands and instructions, if the request is found to be authorized. The authentication is carried out with the help of a special Mobile Banking, Personal Identification Number (MPIN). Furthermore, the requests are only accepted from a mobile phone number that has been registered as the authorized number of operating that particular bank account. With the integration made with the mobile banking server one can get all the financial and non-financial information. After completion of the whole process, the information will be gathered in the oracle database for future reference. For example:-

Dialing to 889 $\longrightarrow$ **Inserting the command and the PIN** $\longrightarrow$ **Navigation of the financial or non-financial information** $\longrightarrow$ **Logging off**
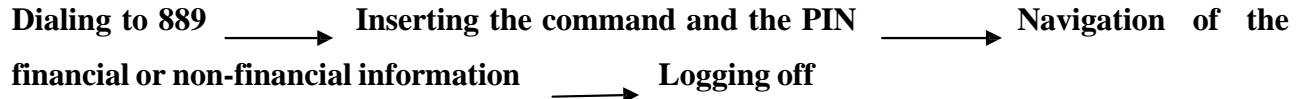
2.6.2 Browser-Based

The browser-based application is essentially a Wireless Access Protocol (WAP)-based internet access (Kim et al. 2009). This requires a compatible mobile phone which is WAP-enabled. The mobile phone is used to access banking portals through the Internet.

Brower-based customer needs to be connected to the internet to use this service. The interface is generated from the server which is transported to mobile device, and this allows the content to be displayed through the browser. This method is extremely fast depending on the server that the customer is connected to but one its disadvantages is that, it requires the subscriber (customer) to stay online all through the transaction process and could lead to higher cost for the customers.

2.6.3 Client-Based (Downloadable Applications)

This method requires the customers to use software installation, and this will serve as a user interface that can allow customers to use the mobile device while offline to access some basic transactions before going online. Typing details before connecting to the internet could reduce cost. This client based application is particularly useful because it allows customers to stay offline and while preparing transaction such as entry of account details and afterwards the transmission is made by sending out the data, this banking process conducted offline reduces online connection time and cost (Pendharkar 2004). These are mobile banking applications that the users should download on their phone. Using the properties of these applications, transactions can be encrypted completely in both source and destination. Since this software has been designed for special purposes, mobile banking application designers can optimize the applied interface for the financial transactions.

The independence of application is one of the advantages of these applications for financial institutions (Ming 2007). Once customers have downloaded the software on their phone, they can use the Mobile Banking application. In other words, the application should be compatible with the various needs and functions for a large number of mobile phones and this is expensive. The phone should also support one of the environments such as the Microsoft Windows Mobile. Another problem of mobile banking applications is that the customers should download the software, install it on their devices, and update its new versions, and maybe this is a new problem for some of the customers.

2.7 Factors Influencing Usage of Mobile Banking

Several theories are offered in order to identify factors that cause people accept new technologies and information systems and use them (Rao and Troshani 2007). The next section presents some of these theories and based on that conceptual frame work for this particular study is formulated.

2.7.1 Technology Acceptance Model (TAM)

TAM was first introduced by Fred Davis in 1989 to predict user acceptance of new technologies. According to (Davis 1989), TAM suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are the two most important factors in explaining individual users'

adoption intentions and actual usage. Davis (1989) defines perceived usefulness as the degree to which a person believes that using a particular system will enhance his or her job performance. Perceived Ease of Use refers to the degree to which the person believes that using the system will be free of effort.

TAM has been extensively tested and validated and is a widely accepted model, which can be modified or extended using other theories or constructs according to author in (Masinge 2010) and its usage has captured the attention of IS community attested by the authors in (Mathieson et al 2001). Masinge (2010) conducted a study on the factors influencing the adoption of mobile banking services at the bottom of the pyramid (BOP) in South Africa, and added perceived cost, trust and perceived risk constructs to TAM. The results of the study revealed that perceived usefulness (PU), perceived ease of use (PEOU), perceived cost, and customer's trust had a significant effect on the adoption of mobile banking at the BOP while perceived risk (PR) was found to have no significant effect.

As a result of this many other models of extension have been suggested by the authors in (Luarn and Lin 2005).The perceived credibility, perceived financial cost and perceived self-efficacy has been adopted based on the literature, as an extension of Technological Acceptance Model (TAM) to investigate and understand the behavioral intention of users of mobile bankers (Luarn and Lin 2005).

➢ *Perceived Usefulness*

Perceived usefulness is defined as the extent to which an individual believes that he or she would benefit from using mobile banking. (Bhatti 2007; Kim, Chan and Gupta 2007) argued that an individual often evaluates the consequences of their behavior and makes a choice based on the desirability of perceived usefulness. Therefore, perceived usefulness will influence their intention to accept and adopt a system. In the context of mobile banking, one of the reasons people use mobile banking is that they find the systems useful to their transactions and saves their time as well. Benefits are also observed by banks in the form of declining the number of branches which reduces the cost per transaction.

Perceived usefulness is found to be the most significant factor influencing the intention to use mobile banking. This finding suggest that if mobile banking is to be accepted by users, they

should perceive it as a useful and quicker way of doing banking transactions compared with the traditional banking system.

(Luarn and Lin 2005) found that perceived usefulness is a vital factor determining the mobile customer usage. (Wang et.al 2003) also agree that most customers choosing mobile services because they see their benefits. On another side, (Suoranta 2003) support that lack of awareness of its usefulness and benefits realization are important factors which hinder mobile banking acceptance.

> ## *Perceived Ease of Use*

Perceived ease of use is defined as the degree to which a person believes that using a particular system would be free of effort. Prior studies show that perceived ease of use has a significant effect on usage intention, either directly or indirectly through its effect on perceived usefulness (Davis 1989; Venkatesh 2000; Venkatesh and Davis 1996). A system perceived to be easier to use will facilitate more system use and is more likely to be accepted by users (Venkatesh and Morris 2003).

TAM points that perceived ease of use influence the innovation acceptance. It decrease the effort paid in learning and applying new technologies. Many researches give support to TAM that perceived ease of use has positive impact on perceived usefulness and mobile services adoption (Porteous 2011, Ezeoha 2005). (Bong-Keun & Tom 2013) stated on their empirical investigation that perceived ease of use has a major significance on the adoption of mobile banking. This finding suggests that customers seek a simple, easier, faster process and environment for banking transactions. It was also showed that perceived ease of use is a major determining factor explaining the attitude difference between adopter and non-adopters toward mobile banking.

In the context of mobile banking, customers may find mobile banking services uneasy when the system is not easy to learn and easy to use. Information such as details of products or services, their benefits, and usage guidelines needs to be provided as it will make it easier for customers to adopt mobile banking. Furthermore, perceived ease of use helps in building trust with banks as it may send a signal that banks have really put in thought about their end users (Wang, Lin and Tang 2003). Many previous empirical studies further show that perceived ease of use has a positive influence in the adoption of mobile commerce (Khalifa and Shen 2008, Kim et al 2009; Wei et al.2009).

2.7.2 Innovation Diffusion Theory (IDT)

Rogers (2003) identifies three characteristics of innovations: relative advantage, compatibility, and complexity. Adopters have invariably been found to have different perceptions about these characteristics in comparison with non-adopters. According to (Kotler 2000), the characteristics of an innovation affect its rate of adoption. Some products catch on immediately, whereas others take a long time to gain acceptance. If the innovation is perceived to be better than the existing system (a measure of its relative advantage), is consistent with the needs of the potential adopter (a measure of its compatibility), and is easy to understand and use (a measure of its complexity), it is more likely that a favorable attitude towards the innovation will be formed (Ching and Ellis 2004).

Lee et al. (2005) found that the perceived relative advantage, compatibility and complexity of the innovation played a key role in the adoption of mobile banking. Therefore this study identifies how these characteristics of innovation influence the adoption of mobile banking in Ethiopia. The remaining parts of this section identify these characteristics of innovations as established in prior studies.

Chaipoopirutana, Combs, Chatchawanwan, and Vij (2009) and Lin (2011), claimed that the adoption of mobile banking is 'complex' as it has the negative relation with intention to adopt mobile banking. In this paper they have discussed the (Rogers 2003) innovation diffusion model's attributes: complexity, compatibility, relative advantage and triability and found that Relative advantage, compatibility, ease of use (opposite of complexity) has a significant effect on attitude to adopt mobile banking services. They have also suggested that compatibility has a positive relation with the adoption of mobile banking. Customers have a favorable attitude towards adopting mobile banking services, if they have positive belief about the relative advantage of mobile banking.

On the other hand (Lee et al. 2005) performed eight interviews to collect transcripts from participants and concluded that relative advantages and compatibility were positive factors affecting the adoption of mobile banking.

> ### *Relative Advantage*

Relative advantage describes the degree to which an innovation is perceived as being better than its precursor (Rogers 2003). Gerrard and Cunningham (2003) identify a perceived relative

advantage as being a significant factor driving the adoption of mobile banking.

According to (Kotler 2000) when individuals pass through the innovation-decision process, they are motivated to seek information in order to decrease uncertainty about the relative advantage of an innovation. Potential adopters want to know the degree to which a new idea is better than an existing practice. Hence relative advantage is often the content of network messages with regard to an innovation. Relative advantage, in one sense, indicates the strength of the reward or punishment resulting from the adoption of an innovation. There are a number of sub-dimensions of relative advantage such as the degree of economic profitability; decrease in discomfort; time saving; and effort (Rogers 2003).

Relative advantage also refers to the comparative benefits that a user of mobile banking may avail which he/she could not get from other traditional banking services as mentioned by (Pikkarainen et. al 2004) that users are more likely to adopt mobile banking if they believe using mobile banking will gain more relative advantages as compared to other traditional banking channels such as ATM or non-mobile internet banking. It includes perceived cost and time.

a) Perceived Cost Savings refer to the transaction cost of conducting mobile banking transactions, including the airtime and bank charges. Perceived cost is defined as the extent to which a person believes that using mobile banking will cost money (Luarn & Lin 2005). The cost may include the transactional cost in the form of bank charges, mobile network charges for sending communication traffic (including SMS or data) and mobile device cost.

b) Perceived Time Saving refer to the time required to complete a transaction. Lee (2009) found in his study that time plays an important role in adopting mobile banking service by the users. It has been observed by researchers that when user perceives relative advantage or relative usefulness of a new technology over an old one, they tend to adopt it (McCloskey 2006; Rogers 2003). Therefore mobile banking adoption is affected by the benefits available such as immediacy, convenience and affordability to customers (Lin 2011).

➢ *Compatibility*

Compatibility refers to the degree to which a service is perceived as consistent with users' existing values, beliefs, habits and present and previous experiences (Chen et al. 2004).

Compatibility is defined as the degree to which an innovation is perceived as being consistent with the existing values, past experiences and the needs of potential adopters. An innovation can be compatible or incompatible with socio-cultural values and beliefs; with previously introduced ideas; or with client needs for innovations (Rogers 2003).The compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption.

Compatibility is a vital feature of innovation as conformance with user's lifestyle can propel a rapid rate of adoption (Rogers 2003). Study on compatibility is a significant antecedent in determining customers' attitude towards electronic banking adoption in Malaysia (Ndubisi and Sinti 2006). Compatibility has further been found influential in the adoption of virtual store, mobile payment and mobile banking (Koenig-Lewis 2010; Lin 2011). Al-Gahtani (2003) found that compatibility had significant correlation with computer adoption and use.

> *Complexity*

Complexity is defined as the degree to which an innovation is perceived to easy to understand and use. Adoption will be less likely if the innovation is perceived as being complex or difficult to use (Rogers 2003). Complexity can be considered as the exact opposite of ease of use in the Technology Acceptance model, which has been found to directly impact the adoption of the Internet (Leaderer, et al. 1999).

Customers will reject an innovation if it is very complex and not user friendly. In this context, Cooper and Zmud (1997) report ease of use of innovative products or services as one of the three important characteristics for adoption from the customer's perspective. For example, the user-friendliness of domain names, navigation tools and the graphical user interface are important determinants of the user-friendliness of a web page design. Research by Davis (1989) has found that perceived complexity is associated with the adoption of electronic technologies. Since mobile banking adoption is at the early stages of adoption in Ethiopian banking industry the complexity factor will be included in perceived to ease of use factor.

> *Observability*

Rogers (1995) argues that observability is the "degree to which the results of an innovation are visible and tangible to others". Liu and Li (2009) assert that the more it is easy to describe and observe an innovation the more positive impact it will have on people which will eventually

encourage usage of the innovation. Cruz *et al.* (2010) affirm that probability of adopting an innovation increases when the benefits and usage of innovation can be easily observed.

> ➤ *Triability*

Triability is defined as the "degree to which an innovation can be tried on a limited basis (Rogers 1995). As per Rogers, there is faster adoption of new ideas when these can be tried before their full implementation whilst adoption tend be slower where prior trial is not possible (Puscel *et al.* 2010). Tan and Teo (2000) assert that if given the opportunity to evaluate innovation, customer minimize the particular concerns of the unknown, which led to acceptance. Therefore, repeating the evaluation and assistance in the use of mobile banking during the trial period can reduce the uncertainty about mobile banking, eventually creating positive customer attitudes to using mobile banking. Triability can also be viewed as the degree to which an innovation may be experimented with on a limited basis (Huisman and Iivari 2006)

This research used an extended TAM containing the following constructs - perceived usefulness, perceived ease-of-use, perceived trust and awareness and also three IDT constructs-relative advantage, perceived risk and compatibility to explore the adoption of mobile banking. Therefore; the research integrated the TAM and IDT along with trust and awareness to investigate the main factors influencing mobile banking adoption. The additional TAM constructs perceived risk, awareness and trust as indicated in different literatures are stated as follows.

> ➤ *Perceived Risk*

Perceived risk is the "uncertainty about the outcome of the use of the innovation" (Gerrard and Cunningham 2003).Perceived risk as defined by (Pavlou 2001), "It is the user's subjective expectation of suffering a loss in pursuit of a desired outcome". The quality of electronic services offered with the possible risk of illegal activities and fraud has always been a concern for both customer and service providers (Ba and Pavlou 2002).

On a study conducted by (Masinge 2010) on the factors influencing the adoption of mobile banking services at the bottom of the pyramid (BOP) in South Africa, perceived risk, perceived cost, trust were added to constructs of TAM. In the study, the risk factor as perceived by bank customers in electronic transactions may comprise of five facets of security/privacy risk, performance risk, time/convenience risk, financial risk and social risk.

According to (Lee 2009), performance risk refers to the loss incurred by malfunctioning of mobile banking servers. Security/privacy risk refers to a potential loss due to fraud or a hacker compromising the security of a mobile banking user. Time risk refers to the loss of time and any inconvenience incurred due to the delays of receiving payments or the difficulty of navigation. Social risk refers to the possibility that using mobile banking may result in disapproval by one's friends, family, or work group. Financial risk refers to the potential for monetary loss due to transaction errors or bank account misuse.

According to (Dineshwar and Steven 2013), perceived risk and reliability were found to be the main obstacles to mobile banking usage in the African country of Mauritius. Risk in mobile banking is perceived to be higher than conventional banking because information exchange on wireless infrastructure, which produced inherent doubts among customers as hacking and other malicious attacks, might cause financial and personal data loss. Further an empirical analysis conducted by (Cheah, et al. 2011) on factors affecting Malaysian mobile banking adoption perceived risks was found to be negatively associated with mobile banking adoption.

➢ *Perceived Trust*

According to (Gefen 2003), trust is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another". Trust is important because it helps customers overcome perceptions of uncertainty and risk and helps build appropriate favorable expectations of performance and other desired benefits. In any business or commerce deal trust is an important element. When dealing with technological and information technology enabled system for commerce activities like electronic commerce and mobile commerce then it is important to comprehend about the security and privacy concerns (Howcroft Hamilton & Hewer 2002; Hosein 2011). Trust can be developed through spreading the right information and giving customers or users of mobile banking furnished details about the mobile commerce system to ensure the easily manageable use of mobile banking system (Pavlov 2003). A study by (Bhattacherjee 2002) provided a definition and measurement of the customer's trust of an e-commerce service provider, based on the three dimensions or typology of trust: ability, integrity and benevolence. (Bhattacherjee 2002) defined these as follows:

a) Ability refers to the perception of the customer about the competency and salient knowledge

of the mobile banking service provider to deliver the expected service;

b) Integrity refers to users' perceptions that the service provider will be fair, honest and adhere to reasonable conditions of transactions;

c) Benevolence refers to the extent to which a service provider will demonstrate receptivity and empathy towards the user. The service provider will make a good faith effort to resolve users' concerns and intends to do good to the users beyond profit motives.

Customers' confidence about privacy and security of a system may significantly influence adoption and usage of mobile banking. In this study, trust is defined as the extent to which an individual believes that using mobile banking is secure and has no privacy threats. Perceived Trust therefore is an important construct which affects customer behavior and determines the success of mobile banking adoption (Wei *et al*. 2009). (Sadi and Noordin 2011), in an exploratory analysis of the factors influencing adoption of M-commerce in Malaysia reveals that trust identified as a key factor influencing the adoption of M-commerce. A similar study carried out by (Mashagba et al 2013) revealed that trust, risk and security had an effect on mobile banking adoption Security and privacy are found to be the major obstacle in adoption of electronic based banking activities. Customers tend to use those facilities which they believe to be the secured one and which are from some credible source. People generally first think about the trustworthiness of communication network and then about the service provider (Yeh & Li 2009).

Many researchers have found privacy and security that concerns which encompasses the trust factor, is found to be the most important and significant factor impeding the adoption of mobile banking activities (Horton et al. 2002;Gunsaekaran&Ngai 2003;Nasri 2011). The trusting intention represents users' willingness to engage in subsequent transactions with the service provider (Bhattacherjee 2002). The higher levels of trust in a service provider will therefore lead to a greater intention on the part of user to engage in mobile banking transactions (Gu, Lee & Suh 2009; Lee et al. 2007).

Awareness The level of information customers have on mobile banking is one of the major factors impacting the adoption and usage of online banking according to the author in (Sathye 1999). The research further states that the adoption rate of an innovation could be determined by level of awareness of the customers. The use of mobile banking services is new to many customers and the banks need to create enough awareness to capture the attention of the customers.

Adoption is the acceptance and continued use of a product, service or idea. According to (Sathye 1999), customers go through "a process of knowledge, persuasion, decision and confirmation" before they are ready to adopt a product or service. The adoption or rejection of an innovation begins when "the customers becomes aware of the product". Hence for adoption of mobile banking, it is necessary that the banks offering this service make the customers aware about the availability of such a product and explain how it adds value relative to other products of its own or that of the competitors.

Customers must become aware of the new brand or technology. An important characteristic for any adoption of innovation service or product is creating awareness among the customers about the service or product (Sathye 1999).

Awareness creation speeds the sales of products and evidences from different participants, lay credence to this. The level of awareness (Palvia 2009) is an important factor in encouragement of consumers to adopt related self service facilities.

The amount of information customer's have about online banking has been identified the major factor impacting the adoption. According to (Sathye 1999) while the use of online banking service is fairly new experience to many people, low awareness of online banking is major factor in causing people not to adopt online banking. In an empirical study of Australian customers found that customers were unaware about the possibilities, advantages or disadvantages involved in online banking.

2.8 Empirical Literature

There is a growing body of academic research examining the determinants of mobile banking acceptance and its utilization (Crabbe, Standing, Standing and Karjaluoto, 2009; Donner and Tellez, 2008; Gu, Lee and Suh, 2009; Luarn and Lin, 2005; Mattila, 2003; Riquelme and Rios, 2010).

Studies have been conducted in various countries to better understand customer's attitudes toward this emerging mobile technology. For example, Mattila (2003) focused on the drivers and inhibitors of mobile banking services. The author found that complexity, compatibility, relative advantage, observability, and triability are the significant factors influencing customer decision making in mobile banking adoption. Also, security and confidentiality of information are fundamental pre-requisites for any mobile banking services to be successful.

Laforet and Li (2005) carried out a research to examine the online/mobile banking in China. Purposive sampling technique was adapted to a sample of five hundred (500) customers who transact their banking business online. Analysis was done quantitatively through a regression model. Based on this research it was established that lack of understanding and awareness of mobile banking benefits are the main factors hindering the adoption of mobile banking usage in China though perceived risk, culture and technological skills are also barriers to online banking in China.

Luarn and Lin (2005) conducted a survey in Taiwan in order to understand user's behavioral intention to use mobile banking service based on the extension of technology acceptance model (TAM). It was observed that the financial cost, perceived usefulness, self-efficacy, credibility and perceived ease of use were the factors influencing the behavioral intention to use mobile banking. In this finding, it was also observed that credibility was a major issue, which has a stronger influence on user's behavioral intention than the technology acceptance model (TAM) of perceived ease of use and perceived usefulness.

Cruz et al. (2010) studied the factors inhibiting the adoption of mobile banking among internet users in Brazil. Based on their finding they concluded that most users never use mobile banking services. They identified risk, cost, complexity, and lack of understanding about the relative advantages of these services as the main barriers of using mobile banking services.

Laukkanen and Kiviniemi (2010) tested the factors affecting the adoption of mobile banking in their study. They intended to find barriers of adoption of mobile banking. These factors included use, value, risk, tradition, and image. The findings of this study indicated that providing information and guidance on the part of the bank have significant effect on reducing the barriers of use, image, value, and risk in mobile banking, but do not reduce the barriers of tradition.

Wessels and Drennan (2010) conducted a study to identify and test the key factors stimulating and hindering the adoption of mobile banking, as well as the effect of user's attitude on the intention of use. They found out that perceived usefulness, perceived risk, cost, and compatibility have significant effect on the adoption of mobile banking. In this study, attitude toward mobile banking was considered as a moderating variable.

Koenig-Lewis et al. (2010) conducted a study on predicting the continuation of the use of mobile banking services by young users in England, aiming at investigation of barriers of mobile banking adoption. Their findings revealed that compatibility, perceived usefulness, and risk are

significant factors affecting the adoption of mobile banking. Compatibility not only has a strong positive effect on the adoption of mobile banking, it is also identified as one of the most important independent variables affecting perceived ease of use, perceived usefulness, and credibility. The variables of trust and credibility were identified as having significant effect on reducing the total perceived risk.

A study by (Sripalawat et al. 2011) examined positive and negative factors affecting mobile banking acceptance in Thailand. Subjective norms, perceived usefulness, perceived ease of use, were considered as the positive factors, and device barrier, perceived risk, lack of information, and perceived financial cost as the negative factors. They found that the positive factors have more influence than negative factors towards the acceptance of mobile banking.

Dineshwar and Steven (2013), the researchers investigated the complex factors that prevent customers from adopting and using mobile banking services in Mauritius. The researchers used a quantitative approach, they also combined the TAM and IDT together with perceived risk and cost construct to investigate perception of mobile banking in Mauritius. The study revealed that age, gender and salary had no influence on adoption but rather, Convenience, compatibility and banking needs influenced banking adoption. On the other hand, Perceived security risk and reliability were found to be the only obstacles to mobile banking usage but also that mobile banking usage is not associated with age, gender and salary.

Mohammad Rokibul Kabir (2013) the researchers investigated on the factors that influence the use of mobile banking in Bangladesh. The approach for this study was quantitative. During the course of the research a self-administrated questionnaire was given to the clients of two full-fledged mobile banking service providers of Bangladesh called Brac Bank Limited and Dutch Bangla Bank Limited. 100 questionnaires were distributed but only 64 useable questionnaires were returned giving a response rate of 64 percent. The data was analyzed using multiple regressions and the outcome of the research was that, Variables such as ability, integrity, benevolence, perceived usefulness, perceived ease of use relative cost and time advantages were found to influence the adoption of mobile banking.

Kazi and Muhammad (2013) Pakistan inspected those factors that affect Pakistan customers from adopting mobile banking services. Data collection was done by surveying 372 respondents from the two largest cities (Karachi and Hyderabad) of the province Sindh by use of judgment sampling method. The researcher used a correlation research design and the analysis was done

using multiple regressions in order to come up with the findings. TAM model played a big role in this research, variables such as social influence, perceived risk, perceived usefulness, and perceived ease of use to study whether they affected the adoption of mobile banking in Pakistan.

Kazemi, S.A., et al (2013) this research investigated those factors that affect Isfahanian Mobile Banking Adoption in Iran, Based on the Decomposed Theory of Planned Behavior. The result of this study suggested that there were only two important factors which are Attitude and perceived behavioral control under which factors such as perceived usefulness, perceived ease of use, compatibility and trust have an influence on behavioral attitude to adopt mobile banking.

Koenig et al (2010) they investigated on the barriers towards Mobile Banking System adoption among young people in Germany. This study was based on the Technology acceptance model (TAM) model. They received 155 responses from all the questionnaires that were sent, they also used a structure equation modeling (SEM) approach to tests the hypothesis. The results of the study indicated that compatibility, perceived usefulness, and risk are significant indicators for the adoption of Mobile banking systems in Germany.

Chitungo, S. K., & Munongo, S. (2013) Zimbabwe, the study was about an analysis of the factors that influence mobile banking adoption in the rural Zimbabwe through extending the technology acceptance model. The researcher adopted use of stratified random sampling and the results of the study suggested that factors such as perceived usefulness, PEOU, relative advantage, personal innovativeness and social norms influenced the intention to accept and use mobile banking.

Cheah et al (2011), this was an empirical study that was conducted with the aim of investigation on the factors that affect the Malaysian customers from adopting mobile banking services. From the study, variables such as perceived ease of use, Perceived usefulness and relative advantage were found to be positively and significantly related to the intention to adopt mobile banking services while a constructs such as perceived risk was found to be negatively correlated with the adoption of mobile banking.

2.9 Research Gap

There have been a number of valuable studies in the area of mobile banking over the years back in North America, Europe, Asia and some from African countries such as Kenya, Ghana, Nigeria and Zimbabwe. Researcher's such as (Gerrard 2003), (La foret 2005), (Masinge 2010), (Teo et

al. 2011), (Al-Jabri 2012) ,(Dineshwar 2013) and others presented evidence for a number of variables that influenced customer behavior intention to use mobile banking, however the study of mobile banking has been given little attention in literatures in Ethiopia.

The existing research in Ethiopia included mobile banking in electronic banking challenges and barriers (Ayana 2012), (Garedachew 2010). As per the researcher knowledge there is no study conducted with regards to factors influencing usage of mobile banking in Ethiopia. This study therefore aims at filling that gap by shedding light on the main barriers of M-Banking adoption among customer of selected private and government banks in Ethiopia ,Addis Ababa in order to create an understanding of this new technology in the banking sector. Justification of model used

Many researches on the acceptance of electronic-banking services have used Davis's (1989) technology acceptance model (TAM). It is argued that using TAM solely is insufficient to explain the adoption or non-adoption of technologies (Chong *et al.* 2010).

Several researches on mobile banking adoption have combined the Diffusion of Innovation Theory and Technology Acceptance Model (Riquelme & Rios 2010). Puschel *et al.* (2010) affirm that taken individually the models have limited predictive power but integrating the two into a single framework results into more predictability. In their investigation on mobile banking, Puschel *et al.* (2010) have integrated elements of the Technology acceptance model (TAM) of Davis with Roger's innovation diffusion theory. Chong *et al.* (2010) affirm that it is better to use TAM as a base model and extend it by including additional variables based on the study that is being carried out.

Akturan and Tezcan (2012) have integrated TAM, perceived benefits and perceived risks to investigate mobile banking adoption. Wessels and Drennan (2010) extended TAM by adding compatibility and perceived risk as constructs for their investigation on customer's acceptance of mobile banking. The study therefore combines TAM and IDT along with perceived risk and perceived trust and awareness constructs to investigate factors influencing mobile banking usage in Addis Ababa, Ethiopia. As a result for this study the factors influencing mobile banking usage are perceived ease of use, perceived usefulness, relative advantage, compatibility, perceived risk, perceived trust and awareness. Furthermore the study will also

3.1 The framework of the study

Based on the existing theories and ideas in the literature, the research formulated an inclusive research framework (Figure 1). The work presented in the dissertation represents a synthesis and extension of two research streams that were identified in discussion above. The model is based on the work of Rogers (1995) and comprises five constructs of innovation attributes, augmented with a perceived risk factor, plus the characteristics of the adopters, in respect of demographical variables of the adopters and communication channels, have been investigated. The dimensions highlighted in the framework present the constructs that form the main research interests in this research.

This framework illustrates the interaction between the independent variables and the dependent variable.

Figure 1 Proposed research model or the conceptual framework
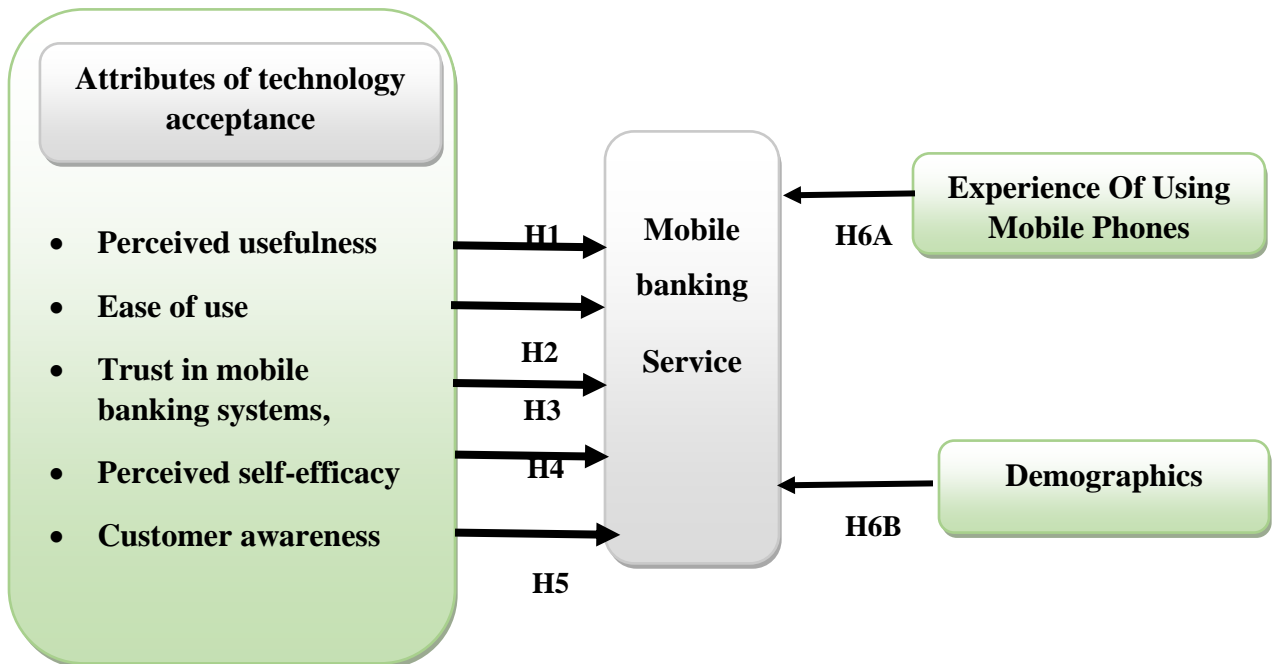
Source: Compiled by researcher

CHAPTER THREE; RESEARCH DESIGN AND METHODOLOGY

This chapter discusses the processes and techniques used in carrying out the study. It also gives a description of the respondents including information on the study population, the number of respondents and how they were selected. It also provides an outline of research design and the instruments for data collection. The methods adopted in the administration of the research instrument, data collection procedure, data analysis and measures used to ensure validity of the instrument used.

3.1   Research Design and Methodology

The methodology that will be adopted to investigate the research questions are described and outlined below.

3.1.1 Research design

As Burns & Bush (2002) stated, research can be used for three Purposes. These are descriptive, exploratory, and explanatory. Causal research primarily explains why events occur by defining the cause-and-effect relationships amongst variables and suitable when the research problem is already well documented (Zikmund 2003). Descriptive research 'paint a picture' using words or numbers and present a profile, a classification of types, or an outline of steps to answer questions such as who, when, where and how (Neuman 2006, p. 35). While exploratory studies are common in the initial stages to gain a better understanding of the problem with in-depth investigation by breaking down a broad problem into smaller and well-defined sub-problems. (Wong 1999) ,

Consequently, exploratory research with a quantitative design is adopted under this study*;* where survey research is followed since it provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population that includes a cross-sectional study using questionnaires for data collection with the intent of generalizing from a sample to a population (Fowler, 2008) consequently, *a cross-sectional descriptive research* is selected since this enable the researcher to compare two or more groups in terms of a cause (or independent variable) that has already happened (M-Banking adoption

vs different demographic characteristics, such as age, income level, marital status and mobile phone usage "experience".).(Creswell ,2014)

A survey questionnaire also be adopted (self-administered questionnaire) to obtain primary data that enables the researcher to measure the relevant constructs in a quantitative manner through the use of statistical techniques (mainly regression and factor analysis) to analyze the respondents' level of agreement or disagreement in the differences between socio-demographic variables employed in the study and the barrier factors.

3.2   Sample and Sampling Techniques

Subsequent to the justification of the research methodology, a sample design is chosen to collect relevant information for the research problem. In selecting a valid sample customer of   both private and government banks in Addis Ababa who provide M-banking services, definition of the target population, selection of sampling method, and determination of sample size is essential

3.2.1 Population

Population is described as a group of elements or cases, whether individuals, objects, or events, that conform to specific criteria and to which we intend to generalize the result of the research(McMillan and Schumacher, 2001). For the present research, the target population comprises of customers of eight major banks in Addis Ababa who are M-banking service users and non M-bank users.

The banks include *Awash international bank, Dashen bank, commercial bank of Ethiopia, Wegagen bank share company, bank of Abyssinia, Nib International Bank, Lion International Bank and Addis international Bank*. These banks was chosen because they offer M- banking services to customers and have vigorous promotion campaigns for their services. The study take place in Addis Ababa, which is the most populous in the country furthermore; where telecommunication infrastructure is available compared to other parts of the country.

In order to determine the awareness of mobile banking and to understand factors that affect the adoption of M-Banking service among customers' questionnaire items directed at non-users of M-banking customers of banks understudy.in a similar manner the same customers targeted to

identify if the income level, marital status, age of the respondents, and number of years of mobile phone usage influence M-Banking service adoption.

3.2.2 Sampling frame

The ideal sampling frame as in many research methodology literatures is based on the notion of its accessibility to the researcher. And so, in the case of this research, since there is no readily available sampling list (frame) for the target population a non-probability sampling method in the form of convenience sampling was used to select respondents from the population since non-probability sampling method is less costly and saves time. Moreover, it is also the only feasible alternative sampling method as a result that the total population may not be available for this study.

3.2.3 Sample size

A survey cannot be implemented properly without knowing the sample size (Aaker et al., 1997).Gay (1996, p.125) stated that selecting a sample size for small population (N<100), there is little point in sampling and surveying the entire population appropriate. If the population size is around 500, 50% of the population should be sampled. If the population size is 1,500, 20% should be sampled. Beyond a certain point (at approximately N=5,000), the population size is almost irrelevant, and a sample size of 400 will be adequate. The total population for this study is estimated to be around 342,528 and the sample size, taking the rational discussed earlier is 384. Following With, 95% confidence interval and 0.05 the confidence interval (also called margin of error) sample determination of calculation done as follows

$$\textbf{Sample size} = \frac{\textbf{Z}^2 * \textbf{(p)} * \textbf{(1-p)}}{\textbf{c}^2} \qquad \frac{\underline{\textbf{1.96}^2 \textbf{ X 0.5 X (1-0.5)}}}{\textbf{0.0025}} = \textbf{384} \quad \textbf{Respondents required}$$

Where:

Z = Z value (1.96 for 95% confidence level)

p = percentage picking a choice, expressed as decimal (.5 used for sample size needed)

c = confidence interval, expressed as decimal (.05 = ±5%)

S. no	Banks	No of branches in Addis Ababa (2015)	No of mobile customers (as of September 2016)	Samples taken	
1	Awash international bank	112	7,518	0.004946551 384	2
2	Dashen bank S.C,	88	17,537	0.011538661 384	4
3	Commercial bank of Ethiopia	192	1,373,675	0.90382453 384	347
4	Wegagen bank share company	56	9,622	0.0063309 384	2
5	Bank of Abyssinia	72	50,679	0.033344804 384	13
6	Nib International Bank	65	11,573	0.007614582 384	3
7	Lion International Ban	38	44,370	0.029193728 384	11
8	Zemen Bank	2	899	0.000591507 384	0
9	United Bank	66	240	0.000157911 384	0
10	Oromia International Bank	49	1,470	0.000967203 384	0
11	Addis International Bank	22	2,264	0.001489624 384	1
Total			**1,519,847**		**384**

3.3   Instruments of Data collection

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer the stated research questions, test hypotheses, and evaluate out comes. Both qualitative and quantitative data is collected. The qualitative data is obtained from a review of relevant literature (secondary sources), whereas the

study uses a self-administered paper-based questionnaire (the survey method) which is designed according to the aims of the research is employed to obtain quantitative data. The questionnaire used a five-point likert scale to measure the variables. Scales to measure each variables developed based on prior studies for example (Cruz et al., 2009; Cruz et al., 2010; Laukkanen &Pasanen, 2008: Meuter et al., 2005) with some measurements being modified to adapt to this study based on focus group that is conducted (a pilot test with a sample of 20) with users and non-users of M-banking to reveal differences in opinions regarding M-banking adoption. .

The questionnaire have three parts; the first part of the questionnaire used to screen prospective of respondents to determine whether they are a customer of one of the eight major banks in Ethiopia. This section also asks the respondents for their demographic information (gender, age, marital status and income), and about their current use or non-use of cell phone and M-banking services (including years of experience).

The second part covered information related to mobile phone usage of respondents, (the specific cell phone they use). The responses from this section are measured using nominal and ordinal scales

The third part of the questionnaire measured the relevant constructs of interest to this study that includes series of 25 statements that covered barriers to adoption of M-Banking derived from the focus group. The constructs is measured on a five point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire items directed at non-users of M-banking, since they were the main focus of this study. The questionnaire is pilot tested with sample of 20 participants encouraging participants to make useful suggestions concerning ambiguous question items for clarity and ease of understanding. After pilot testing, the suggestions and corrections from the participants is incorporated into the final questionnaire. The participants for the pilot testing excluded from the final sample.

3.4   Procedures of Data Collection

Data used to test the research model were gathered from a sample of respondents who are coming to branches of banks under study. Three trained fieldworkers and assistants in Addis Ababa approached prospective respondents using a branch intercept technique during working hours (9:00 AM-4:00 PM) of the week days (Mondays-Fridays). The screening question ensured

that only customers of the eight major banks participated in the study. The filled questioners was collected by hand right after the respondents done filling.

3.5   Methods of Data Analysis

Data analysis was carried out using the Statistical Package for Social Science (SPSS) version 23. Descriptive statistics such as frequency distribution was used to assess the demographic profile of the respondents to make the analysis more meaningful, clear and easily interpretable. Descriptive statistics allow the researchers to present the data acquired in a structured, accurate and summarized manner. The data collected from the field was sorted for completeness, checked for any errors and omissions, and was summarized in tables. Also the data obtained from the study was entered into the computer and was statistically analyzed include descriptive statistics, Exploratory factor analysis and reliability analysis and multiple regression analysis.

CHAPTER FOUR; RESULTS & DISCUSSION

In this chapter, a brief overview of the respondents' profile is derived to support findings based on demographics. Statistical procedures, carried out using SPSS 23 package, are presented in line with study objectives. Furthermore, to review the internal consistency of the scale items (Attributes of technology acceptance), Cronbach coefficients (alpha) were computed, and to assess the relationship (validity) between the variables Pearson Correlation were obtained. Additionally, the results of the analysis are presented in the most appropriate manner

4.1 Data Analysis

A total of 384 paper based questionnaires were administered to customers of the relevant banks who were willing to take part in the study. Only 320 usable responses were obtained representing an effective response rate of 83.33%. However, this sample size is considered adequate according to statistical methods and requirements used in this study as well as comparable studies conducted by Jawaheer, Pudaruth and Ramdin (2012, p. 215) where 384 responses were recorded and Lin (2011, p. 255) where 320 responses were obtained For the purpose of data analysis, the required statistical procedures were applied using SPSS 23 package. Descriptive statistics is used to summarize means of key dimensions and demographic characteristics of the respondents.

4.2 Demographic profile

Table 1 below shows that the survey includes a slightly higher percentage of male participants (51.8%) than female participants (48.2%). Most of the respondents are in the age bracket from 18 to 21 years old (38.8%), followed by those of 22 to 25 years of age (30.7%). This means that more than two-thirds (69.5%) of the sample group are under 40 years old. It has often been suggested that the adopters of technology-based services are relatively young, even though M banking studies (e.g. Mattila 2001) have shown that the typical Internet banking user is more likely to be middle-aged. In this study there was no predominance of middle-aged users. Almost 26 percent of the respondents were married, while 73 percent were unmarried.

Almost a fifth (22.19 %) of all respondents belonged to the annual household income category of Less than 1000 birr, and 30.6 percent of the respondents had an income between 1000-5000 birr. The respondents were distributed fairly evenly over all the income categories, and there were no striking differences in the size of the user groups.

Respondent characteristics	Number of respondents n = 320	Percentage %
Gender		
Male	166	51.83%
Female	154	48.20%
Age		
Under 21	124	38.80%
22-25	98	30.70%
26-35	61	19.00%
36-45	22	6.90%
45-50	12	3.80%
50 years and over	10	3.00%
Marital status		
Married	82	25.60%
Unmarried	238	74.40%
Gross monthly income (in *ZAR*)		
Less than 1000 birr	71	22.19%
1000-5000 birr	98	30.63%
5000-10,000birr	89	27.81%
Greater than 10000 Birr	62	19.38%
No of years of using Mobile phone (Experience)		
Less than 1 year	19	6.00%
1-3 years	27	8.40%
3-5 years	21	6.70%
More than 5 years	252	78.80%

Source: Author's own compilation of Survey data 2016

Table 1. Demographic profile of respondents

On another hand 6% of the respondents' have less than a year's experience of using mobile phones while almost 15% of the respondents' have 2-5 years of experience using mobile phones on the contrary the majority i.e. 79% of the respondents' have more than 5 years of experience using mobile phones.

4.3 Descriptive statistics of Internet and Mobile banking usage

4.3.1 Access to Internet/cellphone that enables Mobile banking

The majority of survey respondents indicate that they have access to the Internet as well as to a cellphone to perform Internet and mobile banking. With regard to Internet access, 263 respondents (82%) have such access, while 58 (18%) do not. With regard to cellphones, 279 respondents (87%) have access to a cellphone that can perform Mobile banking and 29 (9%) indicated that their cellphones cannot perform the function. A further 12 individuals (4%) are unsure whether or not their cellphones accommodate Mobile banking.

Table 2.Accesses to the Internet and to cellphones that enable Mobile banking

	Access to the Internet		Access to cellphone that enables Mobile bank service	
	Frequency	Percentage	Frequency	Percentage
Yes	263	82	279	87
No	57	18	29	9
Not sure	0	0	12	4
Total	320	100.0	320	100.0

Source: Author's own compilation of Survey data 2016

According to the results, the percentage of respondents who have access to cellphones that enable them to conduct cellphone banking (87%) is higher than that of respondents who have access to the Internet (82%) by 5%. It is interesting to note that while all the respondents have a cellphone, 18% indicate that they do not have access to the Internet

4.3.2 Internet and Mobile bank service usage

Since this research aims to examine factors that influence the adoption and use of M-banking, both users and non- users of Internet and Mobile banking are included in the sample. According

to Table 3, 169 (52.7%) of the respondents stated that they use Internet banking while 151 (47.3%) indicated that they do not. With regard to cellphone banking usage, 185 (57.7%) of the respondents who have cellphone banking (enabled by their cellphones) indicated that they use cellphone banking, while 135 (42.3%) indicated that they do not. As such, the percentage of cellphone banking users among the respondents is fairly higher (15.4%) than of non-users. Cellphone banking use among the respondents is thus higher than Internet banking use by 5%.

Table 3.Use of Internet and Mobile banking

Internet/cellphone banking usage	Yes		No	
	Frequency	**Percent**	**Frequency**	**Percent**
Internet	169	52.7	151	47.3
Mobile banking	185	57.7	135	42.3

Source: Author's own compilation of Survey data 2016

This finding is in contrast to similar research by Laukkanen (2007, p. 789) and Laforet and Li (2005,p. 363) who found Internet banking to be the leading e-banking channel in the USA and most European countries. However, this finding is consistent with the observation of researchers (Arnaboldi & Claeys, 2008; Hernández-Murillo, Llobert & Fuentes, 2012; Abdullah & Date, 2010) who predicted that the rapid adoption and use of cellphone technology in Africa will provide stimulus for mobile banking adoption in African countries.

4.4 Factors Influencing Usage of Mobile Bank Service in Addis Ababa, Ethiopia

The questionnaire included one open-ended question which sought to establish the reason from non-users of mobile banking services. Many respondents ignored this question, possibly because it was an open-ended question requiring an individually thought-out answer. Table 4 below summarizes the reasons given for the non-use of mobile banking services by those who responded. As can be seen in the table, '*trust issues and the security'' of M-banking* are the most common reasons given for non-use of M-banking services. This supports the findings by Al-Somali et al. (2009), Singh (2004), and Zhao et al. (2010). In these studies, trust and security concerns are shown to be significant deterrents to broad e- banking acceptance.

Twenty respondents cited a "'*lack of interest and/or apathy towards M-banking*''" as the most significant reason for non-use. "'*A lack of information on M-banking services*''" was found to be the third most common reason, as cited by 10 respondents. The three least common reasons for not adopting M-banking are that respondents are "*not technologically inclined*" (5), that they "*do not see the need for it*" (5) and that they "*perceived high charges and/or hidden costs*" (2).

Table 4.Reasons for non-use of mobile bank service

Reason for non-use of mobile bank service	Frequency	Percentage
Trust and security issues	21	22.58
Lack of interest / customer apathy	20	21.50
Lack of information on Internet and / or cellphone banking	10	10.75
Preference for traditional modes of banking	9	9.68
Lack of access to computer / Internet / cell phone that can perform M-banking	8	8.60
I don't know why / I am not sure	7	7.53
Perceived difficulty / complexity of using M-banking	6	6.45
Not technologically inclined	5	5.38
Do not see the need for it	5	5.38
Perceived high charges / hidden costs	**2**	**2.15**

Source: Author's own compilation of Survey data 2016

4.5 Reliability and validity analysis

To ensure internal consistency among the items included in each of the scales, Cronbach's coefficient alpha is estimated. Higher Alpha coefficients indicate higher scale reliability. Specifically, (George & Mallery 2003) suggested that scales with 0.60 Alpha coefficients and above are considered acceptable. Reliability analysis allows studying the properties of measurement scales and the items that make them up. The Reliability analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale. Intra-class correlation coefficients can be used to compute interpreter reliability estimates. Based on this, reliability analysis were performed to make sure that weather questionnaires used measure barrier of mobile banking service of Addis Ababa customers.

All the scales that are used to measure the dimensions in this study were tested for reliability prior to their use in the main research analysis. Cronbach's alpha coefficient (a) is applied in this regard. This is a widely used method which specifies how well a set of items measure a single, unidimensional latent construct (Sijtsma, 2009, p. 109). The Cronbach alpha values range from 0 to 1 with values above 0.7 generally considered a good indicator of an internally consistent (reliable) scale (Nunnally, 1978, p. 245). The results presented in Table 5 below indicate that the Cronbach alpha values calculated for the data in the study range from .936 to .958 for mobile bank service. Thus it was established that the scales used in this study are highly reliable.

Table 5.Reliability Test (Cronbach's Alpha)

Dimensions	Cronbach's alpha coefficients for dimensions
Perceived Usefulness	0.944
Perceived Ease of Use	0.954
Perceived Trust	0.936
Compatibility	0.958
Awareness	0.940
Reliability of total scale	0.924

Source: Author's own compilation of Survey data 2016

4.6 Exploratory factor analysis

An exploratory factor analysis using the Principal Component Analysis (PCA) was carried out to ascertain whether the scale items are correctly loaded for the dimensions used in this study. The PCA was also conducted to prevent multicollinearity, which leads to misrepresentative results (Akturan & Tez- can, 2012, p. 450). To achieve construct validity, factor loadings must be statistically significant. This is tested by obtaining a loading of 0.50 or higher with a bottom cut-off point of 0.70 (Hair et al., 2011, p. 444). It is widely agreed that factor loading values that exceed .50 are significant indicators of convergent validity. The results shown in Table 6 indicate that the factor loadings for the scale items used to measure the dimensions range from .822 to .965 for mobile bank service respectively. Therefore, all the items used have achieved convergent validity

Table 6.Exploratory factor analysis

Measurement items of the constructs	Factor loadings
Perceived usefulness	
M-banking banking makes it easier to do banking activities	.887
M-banking enables one to do banking activities more quickly	.931
M-banking enables one to complete banking activities more conveniently	.920
M-banking allows one to manage banking activities more efficiently	.889
M-banking is useful in conducting banking activities	.891
Perceived ease of use	
I think it is easy to learn how to use M- banking	.934
I think it is easy to get M- banking to do what I want it to do	.942
I think it is easy to become skillful at using M- banking	.965
Overall, I think M-banking is easy to use	.925
Trust in the M-banking system	
M-banking has enough safeguards to make me feel comfortable using it	.855
feel assured that legal structures adequately protect me from problems associated with using M- banking services	.876
I feel confident that technological advances s makes it safe for me to use M- banking	.836
In general, the Mobile phone is a safe environment in which to transact banking activities	.839
Perceived self-efficacy	
I feel confident using the mobile phones	.822

I feel confident using the user's guide/help menu when help is needed	.911
I feel confident making selections from an onscreen menu	.922
Awareness of M-banking services	
I receive enough information about M- banking services	.913
I receive enough information about the benefits of M- banking	.940
I receive enough information on using M- banking services	.944
I receive information about M-banking services from my bank	.885

Source: Author's own compilation of Survey data 2016

4.7 Descriptive statistics of the research constructs

The researcher used descriptive statistics to determine the respondents' perception of Mobile bank services with regard to its perceived usefulness and ease of use, trust in the Mobile bank system, perceived self-efficacy and level of awareness of M-banking services. The results for each factor are shown in Table 7 and discussed below.

Table 7.Descriptive statistics of research constructs

Measurement items of the constructs	Mean	Standard deviation
Perceived usefulness	3.94	0.932
M-banking banking makes it easier to do banking activities	3.91	1.086
M-banking enables one to do banking activities more quickly	3.95	1.047
M-banking enables one to complete banking activities more conveniently	3.92	1.014
M-banking allows one to manage banking activities more efficiently	3.91	0.997
M-banking is useful in conducting banking activities	4.01	1.014
Perceived ease of use	3.92	1.004

I think it is easy to learn how to use M- banking	3.88	1.101
I think it is easy to get M- banking to do what I want it to do	3.88	1.065
I think it is easy to become skillful at using M- banking	3.91	1.061
Overall, I think M-banking is easy to use	3.99	1.057
Trust in the M-banking system	3.46	1.028
M-banking has enough safeguards to make me feel comfortable using it	3.44	1.144
feel assured that legal structures adequately protect me from problems associated with using M- banking services	3.39	1.119
I feel confident that technological advances s makes it safe for me to use M-banking	3.48	1.060
In general, the Mobile phone is a safe environment in which to transact banking activities	3.54	1.147
Perceived self-efficacy	3.55	1.044
I feel confident using the mobile phones	3.53	1.101
I feel confident using the user's guide/help menu when help is needed	3.59	1.118
I feel confident making selections from an onscreen menu	3.52	1.151
Awareness of M-banking services	3.38	1.101
I receive enough information about M- banking services	3.46	1.040
I receive enough information about the benefits of M- banking	3.23	1.139
I receive enough information on using M- banking services	3.37	1.118
I receive information about M-banking services from my bank	3.45	1.145

Source: Author's own compilation of Survey data 2016

4.7.1 *Perceived usefulness.*

As shown in the table above, the results suggest that the respondents generally perceive M-banking to be useful with the scores (mean = 3.94; SD = 0.932). Furthermore, all the mean values are above 3.90. Taking into account that all the mean scores are above the midpoint of 2.50 on the five-point scale used in this study, it is deduced that the respondents generally have a positive view regarding the usefulness of M- banking. This finding is substantiated by Frangos (2009, p. 157) who notes that the ultimate reason why consumers use M-banking services is because they perceive them as useful in conducting banking transactions. To encourage M-banking acceptance by customers, Jeong and Yoon (2013, p. 37) recommend that banks take advantage of the perceived usefulness and value-adding characteristics of M-banking in their promotional efforts.

4.7.2 Perceived ease of use.

Similarly, the analysis points to a positive perception among respondents regarding the perceived ease of use M-banking (mean = 3.92; SD = 1.004). It can be said that respondents perceive M-banking to be easier to use. For instance, respondents do not only believe that it is easier for them to learn how to use M-banking, they also perceive themselves to be more skillful at using M-banking. This is supported by evidence in extant literature which establishes that a system perceived as easier use by customers provides a stimulus for rapid adoption (Maduku, 2013; Jeong & Yoon, 2013; Venkatesh, Speier & Morris, 2002).

4.7.3 Trust in the M-banking system.

The result of the analysis portrays respondents' lower level of trust in the m-banking system with the highest item- by-item scores being (mean = 3.54, SD = 1.147) for M- banking. With regard to trust in M- banking, the mean is 3.46 with a standard deviation of 1.028. Few respondents agree that existing legal structures sufficiently shield them from harms associated with M- banking (mean = 3.39). Few also agree that mobile bank service is a safe environment in which to transact banking activities. For this aspect, the mean is 3.45 M- banking. Even though respondents generally have a low level of trust in M- banking, this finding validates existing observations in literature which identify a lack of trust as a leading obstacle to the widespread adoption of M-banking services among retail customers (Hong et al., 2013, p. 29; Delafrooz et al., 2011, p. 75; Yousafzai et al., 2010, p. 1181).

4.7.4 Perceived self-efficacy

The results of the analysis reveal that respondents are generally confident in their ability to use mobile phones for banking service. With regard to M-bank service a mean of 3.87 and a standard deviation of 1.111 were obtained for respondents' perceived self-efficacy in cellphone usage. Additionally, the mean values on individual items were all between 3.52 and 3.59. This suggests that respondents are more confident in their ability to use cellphones.

4.7.5 Awareness of M-banking services.

With regard to respondents' level of awareness of M-banking services, the results presented in Table 7 show the overall scores for M- banking are (mean = 3.38; SD = 1.101). On an item-by-item basis, it is noted that the mean values range from 3.23 to 3.45 with 3.0 as a neutral point. These mean values are not high which suggests that awareness efforts may not be very effective in reaching customers. This observation is in line with the studies by Al-Somali et al. (2009, p. 137) and Sathye (1999, p. 325) who argue that a high level of M-banking adoption cannot be expected if customers do not realize the opportunities that M- banking offers.

4.8   Hypothesis Testing Using Multiple Regressions

To make a proper decision regarding the relationships between the variables, multiple regression has been used to test the hypothesis for the independent and dependent variables. This section discusses in detail the analysis of the results for each independent variable and their significance in influencing mobile banking usage. Furthermore, the discussion analyzes the statistical findings of the study in relation to the previous empirical evidences. The result for each set of factors is discussed as follows.

Multiple regression analysis was performed in order to examine the degree to which the factors of *perceived usefulness* and *ease of use*, *trust in the M-banking system*, *perceived self-efficacy* and the level of *customer awareness* could help explain the adoption of M- banking services. The results of this analysis, shown in Table 8, indicate that the dependent variables account for 72.4% for variability in M- banking. This means more than 72.4% of variations in usage of mobile banking in Addis Ababa, Ethiopia were explained by independent variables included in the model. However, the remaining 27.6% changes in mobile banking usage in Addis Ababa city are caused by other factors that are not included in the model. The overall significance or acceptability of the model from a statistical perspective can be measured using the significance

value of F statistic (.0000), which is less than p<0.05, (except Perceived self-efficacy) the model is significant. This indicates that the variation explained by the model is not due to probability and is valid.

Table 8.Results of the multiple regression analysis

	Mobile bank service		
Dependent variable: M-banking adoption	$R^2 = .724$		
Independent variables	**Beta**	***t*-value**	**Sig.**
Perceived usefulness	.289	7.249	.000
Perceived ease of use	.269	5.790	.000
Trust in the M-banking system	.361	10.101	.000
Perceived self-efficacy	.211	4.052	.010
Awareness of M-banking services	.188	2.089	.002

Source: Author's own compilation of Survey data 2016

The ***B*** *coefficients* are important for both prediction and interpretive purposes; however, analysts usually look first to the ***t*** test at the end of each row to determine which independent variables are significantly related to the outcome variable

Because five variables are in the equation to be tested if there is a linear relationship between each independent variable and the dependent variable after adjusting for the effects of the four other independent variables. Looking at the significance values, it can be seen that all five of the predictors are statistically significant (except Perceived self-efficacy), so the remaining four factors will be of the predictors.

Betas are standardized regression coefficients and are used to judge the relative importance of each of the independent variables. The values range between –1 and +1, so that the larger the value, the greater the importance of the variable. The result point to a positive linear relationship between M-banking adoption and the variables employed in the study. From the analysis, In Addis Ababa case, the most important predictor is *customers' trust* in the M-banking system is the most significant determinant of adoption for M- banking services following P*erceived usefulness, Perceived ease of use and Awareness of M-banking services*. This is evident from the fact that trust in the M- banking systems have the highest beta coefficient values of .361

respectively compared to all the other variables. Consequently All the hypotheses, with the exception of H4 (Perceived self-efficacy) are supported.

The support for H1 a, technology perceptions, (β= .289, p=.000) is in line with e.g. (Luarn and Lin, 2005) findings It seems that users will look on mobile banking more positively if they are accustomed to mobile phones, computers and other technology-based products and services, and if they have a positive attitude towards technology as a whole. Moreover, most customers choose to adopt mobile services because they see the benefits they could obtain, the convenience and any time anywhere accessibility

In a similar vein, H2, Perceived ease of use, was supported (β= . 269, p=.000). As argued by Rogers (1995), it seems to be the case that potential adopters who are able to experiment with an innovation are more likely to adopt the innovation. In the present study, it emerged that those respondents who had already tried mobile banking services were more likely to be current users of the services.

Related with H3 the most important predictor is *customers' trust* (β= . .361, p=.000) in the M-banking system is the most significant determinant of adoption for M- banking services evidenced by having the highest beta value compared with the other variables.

Consequently, related to H4 the coefficient of self-efficacy is .211 and P-value is 0.10. Holding other explanatory variables constant, perceived self-efficacy was found to have a positive and statistically insignificant influence on usage of mobile banking. Therefore, the researcher rejects the null hypothesis that customer's perceived self-efficacy on the overall mobile banking service has an effect on usage of mobile bank service. Nevertheless, it should be noted that in regard to Internet banking, a similar result was obtained by Tan and Teo (2000). They explained their finding by referring to Moore and Bensabat (1991), who suggested that this attribute starts to take effect only after hands-on trials have begun. In the Finnish setting, an explanation could lie in the fact that the diffusion of mobile banking is still at a relatively early stage.

On the hand H5 Awareness was found to have (β= .188, p=.002) a positive and statistically significant impact on usage of mobile banking as its value of significance is less than 0.05. Therefore the researcher accepts the null hypothesis that stated The greater the Customer awareness of mobile banking services, the more likely that mobile banking will be adopted .This

aligns with the prior research of (Laforet and Li 2005) that indicated awareness to significantly influence customer's usage of online and mobile banking. This result can be explained by the fact that majority of bank customers feel that they have the relevant information needed for usage of mobile banking. This suggests that this variable is an essential factor in influencing mobile banking usage in Addis Ababa, Ethiopia case.

Hypothesis H6 a & b, concerning demographics, was tested using correlation analysis. The results are outlined in Table 9. The variables under study were included on the basis of previous research suggesting that demographic variables may vary having an influence on the adoption of mobile banking services. Only the hypotheses concerning age (number 2) were supported in the analysis. The positive coefficient on age (r=.085**) indicates that older customers are more likely to adopt the services, which is not in line with prior empirical research on electronic banking (e.g. Howcroft et al. 2002). However, Rogers' (1995) suggests that earlier adopters are no different from later adopters in age on the other hand Interestingly, the only other significant demographical variable in this analysis was number of years using Mobile phone (r=.183**). The positive correlation coefficient could be interpreted as indicating that consumers with a number of years using Mobile phone (experience) are especially likely to adopt mobile banking services in Ethiopia Addis Ababa .

H6 a& b: *Table 9.Demographics. Correlation coefficients*

	1) Gender	2) Age	3) Marital status	4) Household	5) No of years using Mobile phone
Adoption of mobile banking services	-.038	.085**	.010	.052	1.83**
Sig.	.190	.003	.731	.077	.001

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

* Correlation is significant at the 0.05 level (2 tailed) (measured by using Pearson's Rho)

CHAPTER FIVE; CONCLUSION AND RECOMMENDATION

The aim of this chapter is to present a summary of all the findings and to make conclusions based on that. Additionally, the implications of the study to the theory and practice are addressed along with directions to future researches. Finally, the limitations of the study and suggestions for further research have been presented.

5.1 Conclusions

The result of this study indicates that trust in the M- banking system remains a significant concern among Internet and cellphone banking users and non-users. Customers' low level of trust in the M-banking system is therefore a major setback to the widespread adoption and use of M- banking services in Addis Ababa, Ethiopia. Banks therefore need to ensure that M-banking platforms are technically sound with state-of-the-art security systems in place to minimize potential risks that end-users may be exposed to. To improve customers' perception of trust in M-banking systems, banks will also need to lobby government to develop suitable legal structures that will assist in apprehending and prosecuting people suspected of M- banking fraud. These security improvements should be part of a communication strategy aimed at instilling trust in customers regarding the services.

This study has found that *Perceived usefulness, Perceived ease of use and Awareness of M-banking services* towards M-banking is another significant reason cited for non-use of the services. Banks need to recognize that a lack of effective communication to create awareness and demonstrate the benefits of M- banking service leads to customer indifference. It is thus imperative for banks to devise communication strategies and increase their efforts to promote M-bank service among their customers. In doing so, banks must endeavor to promote the long-term benefits including cost-saving and convenience to customers. However, the most important element in encouraging the use of M-banking is the trustworthiness of the system. This study has shown that the trust factor in particular should be reinforced in order to realize a wider acceptance of Mobile banking systems in Ethiopia, Addis Ababa.

In order for banks to increase returns on their investment in M-banking for their retail customers, it is imperative that they understand the factors that influence the adoption of M- banking services within their environmental context. For instance, perceived usefulness and ease of use

are variables generally believed to influence the adoption of IT, including M-banking technologies. In this study however, trust in the M-banking system emerged as the most significant factor that impacts on the adoption of M- banking services in Addis Ababa, Ethiopia. Hence this study recommends that retail banks devise and implement strategies that will increase customers' trust in the Mobile banking systems. It is expected that this will lead to the rapid and widespread adoption of Internet and cellphone banking services in Addis Ababa, Ethiopia.

5.2 Limitations and directions for future research

The study has several limitations that offer scope for future studies. Firstly, this study identified five factors that influence retail banking customers' adoption of M- banking services. The literature contains many additional factors that influence customer adoption of M- banking services that are not considered in this study. Future empirical research is therefore needed to examine how other factors such as *perceived enjoyment, perceived playfulness, culture and Internet or cell- phone connection speed* impact on the adoption of M- banking services. The sampling method used in this study could be seen as a limitation given that the study used a convenience sample. Moreover, the study took place in only in one of the 14 regions of Ethiopia (in the capital city) and is cross-sectional in nature; this limits the implications of this research for other M-banking retail customers throughout the country. Future studies can explore the possibility of probability sampling methods using a larger sample drawn from different parts of the country to make the results generalizable to a wider population.

5.3 Recommendation

Based on the above findings, the following suggestions to improve customer's usage of mobile banking are put forward for local banks either offering or planning to launch mobile banking services in Addis Ababa, Ethiopia:-

- Banking institutions could consider taking advantage of value-adding characteristics of mobile banking in promoting perceived usefulness. In addition, they should continue to innovate and invest in mobile banking services which allow users to have more alternatives and get more values from mobile banking services.

- Banks should emphasize on the benefits that customers will obtain in the aspects of cost savings, convenience, flexibility, and mobility when using mobile banking services. Eventually, banks might try to educate users the benefits of using mobile banking services through promotional mix such as personal selling, advertisements, sales promotions, and public relations.

- When designing their mobile banking products might need to emphasize that their service fits with customers' lifestyle, culture and language.

- Banks could invest in campaigns and arrange information sessions to demonstrate the features of mobile banking services, and its benefits over traditional channels.

- With regards to perceived risk it is important for banks and service providers to project higher security when providing mobile banking services in order to yield higher customers' acceptance. In fact, banks and service providers should continuously innovate and offer better security and reliable applications to enhance users' confidence towards mobile banking services.

- To change the customer's perception with regards to risk and trust issues banks could use a well-structured advertisement and staff interaction in order to make them realize that the service is safe to use. This will help the customers to know the advantages and disadvantages associated with the service and as a result of this, they could weigh the costs and the benefits of using the self-service which in turn will reduce unnecessary worries and anxiety.

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St. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

MASTER OF BUSINESS ADMINISTRATION PROGRAM

Dear respondent,

The purpose of this questionnaire is to collect data from employees of Ethiopian airlines for conducting Masters of business administration (MBA) thesis on the title *Barriers to Adoption of Mobile banking: (The case of private and government bank customers' in Addis Ababa, Ethiopia*). Please be honest and objective while filling the questionnaire. The information you give is used only for academic purpose and will be kept confidential.

Thank you, for your cooperation and timely response in advance

Thank you!!

Brikty G.Giorgis

General Instructions

- Please answer all questions
- The questions are open and closed ended, so please put tick (✔) for close ended.

Part-I Demographic Factors

1) Gender

Male ☐   Female ☐

2) Age

Under 21 ☐   36-45 ☐

22-25 ☐   45-50 ☐

26-35 ☐   50 years and over ☐

3) Marital status

Married ☐   Unmarried ☐

4) Monthly Income

Less than 1000 birr ☐   5000-10,000birr ☐

1000-5000 birr ☐   Greater than 10000 Birr ☐

5) No of years of using Mobile phone (Experience)

Less than 1 year ☐   3-5 years ☐

1-3 years ☐   More than 5 year ☐

Part-II mobile phone usage

6) Do you have an Internet access on mobile your mobile phone?

Yes ☐   No ☐   not sure ☐

7) Do you have an Access to cellphone that enables Mobile banking?

Yes ☐   No ☐   not sure ☐

8) Are you an Internet/cellphone banking user of your bank?

Yes ☐   No ☐

Part-III Possible Factors for not Using Mobile Banking

Please indicate the level of agreement on the statements below

1= strongly disagree 2= disagree 3= neutral 4= agree 5= strongly agree

	M-Banking Rejection factors	Rating points				
		1	2	3	4	5
	Perceived usefulness					
1	M-banking banking makes it easier to do banking activities					
2	M-banking enables one to do banking activities more quickly					
3	M-banking enables one to complete banking activities more conveniently					
4	M-banking allows one to manage banking activities more efficiently					
5	M-banking is useful in conducting banking activities					
	Perceived ease of use					
6	I think it is easy to learn how to use M- banking					
7	I think it is easy to get M- banking to do what I want it to do					
8	I think it is easy to become skillful at using M- banking					
9	Overall, I think M-banking is easy to use					
	Trust in the e-banking system					
10	M-banking has enough safeguards to make me feel comfortable using it					
11	feel assured that legal structures adequately protect me from problems associated with using M- banking services					
12	I feel confident that technological advances s makes it safe for me to use M-banking					

13	In general, the Mobile phone is a safe environment in which to transact banking activities					
	Perceived self-efficacy (compatibility)					
14	I feel confident using the mobile phones					
15	I feel confident using the user's guide/help menu when help is needed					
16	I feel confident making selections from an onscreen menu					
	Awareness of e-banking services					
17	I receive enough information about M- banking services					
18	I receive enough information about the benefits of M- banking					
19	I receive enough information on using M- banking services					
20	I receive information about M-banking services from my bank					

1. Could you please explain any other Reasons than above for not using a mobile banking service ?

_____
_____
_____
_____
_____
_____
_____

Annex -2 Data from National bank of Ethiopia

Number of payment Alternativ channels					
Item	Description	Parameter	As at June 30,2014.	As at Jun.30,2015	as at Jun 30,2016
Number of payment Alternatives	ATM Machine Depoloyed	**Number**	867.00	1,234.00	1,689.00
	POS Machine Depoloyed	**Number**	1,354.00	3,343.00	8,127.00
	Nmber of Debit Card holders	**Number**	1,464,328.00	2,329,285.00	3,606,387.00
	Nmber of Credit Card holders	**Number**	-	-	
	Nmber of Prepaid Card holders	**Number**	212.00	718.00	12,221
	Number of Internet Banking Users	**Number**	1,771.00	17,239.00	1,178,861
	Number of Mobile Banking Users	**Number**	119,912.00	526,455.00	342,528
	Mobile wallet users	**Number**	-	-	
Value and Number of Transaction through Various Channels in Thousands					
	ATM withdrawal	**Number**	3,070,709.00	6,098,376.00	10,343,479.000
		Value In '000	2,975,840.66	8,836,391.21	14,456,169.620
	ATM Transfer	**Number**	3,023.00	49,618.00	95,950.500
		Value In '000	23,354.48	144,427.27	

					370,735.015
	ATM Transaction	**Number**	3,073,732.00	6,147,994.00	10,439,429.50
		Value In '000	2,999,195.14	8,980,818.48	14,826,904.64
	POS Machine	**Number**	50,630.00	165,860.67	
		Value In '000	274,389.25	868,332.36	
	Payments Made using Mobile	**Number**	7,678.00	64,590.00	392,194.00
		Value In '000	24,506.67	228,610.19	2,500,423.96
	Payments Made using Internet	**Number**	426.00	4,505.00	16,980
		Value In '000	46,294.46	340,854.24	73,705,122
	Mobile wallet Transactions	**Number**	-	-	
		Value In '000	-	-	

Annex -2 Summary of the operationalization of the variables

`	Item example	Description example	References
Relative advantage	Driver1	mobile banking is and effortless	Moore and Bensabat (1991), Tan and Teo (2000)
Complexity	Usage barrier1	phone is an unpractical for banking	Moore and Bensabat (1991), Tan and Teo (2000), Ram and Shet (1989)
Compatibility	Change1	I do not like changes from the al way I do things (R)	Moore and Bensabat (1991), Tan and Teo (2000), Thornton and White (2001)
Observability	Communn1	I have heard about mobile g from bank's personnel	Lee et al. (2002), Lievens and Moenaert ((2000), Mahajan et al. (1990a)
Trialability	Trial1	like to have an opportunity to try mobile banking services	Moore and Bensabat (1991), Rogers (1995)
Risk	Trust1	using mobile phone in banking s trustworthy	Gerrard and Cunnungham (2003), Mattila (2001)
Individual differences	Technology perception1 Demographic1	I feel comfortable using PC	Agarwal and Prasad (1999), Morris and Venkatesh (2000)