Mobile Banking adoption in Ethiopia: A Case of Commercial Bank of Ethiopia

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Statement of declaration

I, Hayat Nesibu, have carried out independently a research work on "*Perceived Determinants of Mobile Banking adoption in Ethiopia: A Case of Commercial Bank of Ethiopia*"in partial fulfillment of the requirement of the M.SC program in Accounting and Finance with the guidance and support of the research advisor.

This study is my own work that has not beensubmitted for any degree or diploma program in this or any other institution, and that all references materials used for the study have been duly acknowledged.

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Certification

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This is to certify that the thesis prepared by Hayat Nesibu entitled"*Perceived Determinants of Mobile Banking adoption in Ethiopia: A Case of Commercial Bank of Ethiopia*" submitted in partial fulfillment of therequirements for the degree of masters of Science in accounting and finance compiles with theregulations of the university and meets the accepted standards with respect to originality andquality.

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ABSTRACT

The purpose of this study is to investigate the Perceived Determinants of Mobile Banking adoption in Ethiopia: A Case of Commercial Bank of Ethiopia. The study tries to combines two widely used models for technology adoption, the extended TAM model along with Relative advantage to investigate factors influencing mobile banking adoption in commercial bank of Ethiopia. As a result for this study the factors influencing mobile banking adoption are perceived usefulness; perceive ease of use, perceived credibility, Perceived self-efficacy, perceived risk, perceived cost and relative advantage

This study was conducted based on the data gathered from customers of Commercial Bank of Ethiopia and the Survey was conducted using questionnaire. Out of 400 questionnaires that have been distributed, 369 were usable. The research results found perceived usefulness, perceived ease of use , perceived self-efficacy, relative advantage and perceived risk as major influencing factors for mobile banking adoption whereas the study found perceived credibility and perceived cost were found to have insignificant effect on mobile banking usage for bank customers located in Ethiopia. The study recommended banks to emphasize in designing user friendly system, to project higher security when providing mobile banking services and let its customers know how the security issue is reveled in order to yield higher customers' acceptance.

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Table of Contents

Abstract III

Acknowledgements IV

List of Tables VIII

List of Acronyms IX

CHAPTER ONE

1. Introduction 1

1.1. Statement of the Problem 3

1.2. Research Objective and Hypothesis 4

1.3. Scope and Limitation of the Study 5

1.4. Significance of the Study 5

1.5. Structure of the Thesis 6

CHAPTER TWO

2. LITRATURE REVIEW 7

2.1. Theoretical Review 7

2.1.1. Benefits of Mobile Banking 8

2.1.2. Mobile Banking service Models 9

2.1.3. Application security in Mobile banking 11

2.1.4. Factors affecting Mobile Banking Adoption 12

2.1.4.1. Technology Acceptance model (TAM) 13

2.1.4.2. The Theory of reasoned action (TRA) 14

2.1.4.3. Theory of planned behavior (TPB) 15

2.1.4.4. Unified Theory of Acceptance and Use of Technology (UTAUT) 15

2.1.4.5. Diffusion of Innovations Theory (DIT) 16

2.2. Empirical studies 19

2.2.1. Review of previous studies in Ethiopia 19
2.3.Conclusions and knowledge gap.....23
CHAPTER THREE
3. RESEARCH METHODOLOGY 25
3.1.Research objective and development of hypotheses.....25
3.2.Research approach 27
3.3.Research approach adopted.....29
3.3.1. Population &Sampling Design 29
3.3.2. Instrument design and actual conduct of the survey.....31
3.4.Data Analysis 33
3.4.1. Definition and measurement of Variables 33
3.4.2. Model Specification 34
CHAPTER FOUR
4. RESULTS AND DISCUSSION 36
4.1.Results.....36
4.1.1. Respondents Profile 36
4.1.2. Descriptive statistics 40
4.1.2.1. Usage of Mobile Banking Services.....40
4.1.2.2. Factors Influencing Adoption of Mobile Banking in Ethiopia 42
4.1.2.3. Mobile banking Adoption factors 43
4.1.3. Regression results 44
4.1.3.1. Multicollinearity 44
4.1.3.2. Logistic Regression Analysis.....46
4.2.Discussions of regression results 48
4.2.1. Perceived usefulness and mobile banking adoption 48

4.2.2. Perceived Ease of Use and mobile banking adoption 48
4.2.3. Perceived credibility and mobile banking adoption 49
4.2.4. Perceived self-Efficacy and mobile banking adoption 49
4.2.5. Perceived Risk and mobile banking adoption 49
4.2.6. Perceived cost and mobile banking adoption 50
4.2.7. Relative advantage and mobile banking adoption 50
CHAPTER FIVE
5. CONCLUSION AND RECOMMENDATION 51
5.1. Conclusion 51
5.2. Recommendation 52
5.3. Future Research 53
References 54
Appendix 58

List of Tables

Table 2.1mobile Banking Models....10

Table 3.2 Mobile Banking Users by Districts....31

Table 4.1 Gender....36

Table 4.2 Respondents' Age....37

Table4.3 Respondents 'educational level....37

Table 4.4 Respondents' occupational status....38

Table 4. Respondents' monthly income....39

Table 4.6 Respondents' registration status....39

Table 4.7 Respondents' influence to register....40

Table 4.8 Survey findings of usage of mobile banking services....41

Table 4.9 Response of respondents on perceived usefulness, perceived ease of use, perceived credibility, perceived self-efficacy, perceived risk, perceived cost and relative advantage....42

Table 4.10 Response of respondents on Mobile Banking Adoption....43

Table 4.11 Correlation Matrix....45

Table 4.12a Logistic Regression results....46

Table 4.13b Logistic regression results....47

Lists of Figures

Figure 2.1Model developed by the researcher based on extended TAM model (Luarn and Lin, 2005) and DIT model (Rogers, 2013)....18

List of Acronyms

ANOVA-Analysis of Variance
CBE-Commercial Bank of Ethiopia
DIT- Diffusion Innovation Theory
EDI-Electronic Data Interchange
EFT-Electronic Fund Transfer
ETB-Ethiopian Birr
ICT-Information Communication Technology
MBA-Mobile Banking Adoption
MIS-Marketing Information System
NBE-National Bank of Ethiopia
PC-Perceived Cost
PCR-Perceived Credibility
PEU-Perceived Ease of Use
PIN-Personal Identification Number
PR-Perceived Risk
PSE-Perceived Self Efficacy
PU-Perceived Usefulness
RA-Relative Advantage
SMS-Short Message Service
SPSS-Statistical Package for Social Science
TALC-Technology Adoption Life Cycle
TAM-Technology Acceptance Model
TOE-Technology Organization Environment
TPB-Theory of Planed Behavior
TRA-Theory of Reasoned Action
UTAUT-Unified Theory of Acceptance & Use of Technology

CHAPTER ONE

1. INTRODUCTION

Recent years have witnessed an increasing convergence of digital technologies. Information technology has gradually converged with telecommunication technologies to give us Information and Communication Technology (ICT), hence the integration of telecommunications, data communications and mass communications into a single medium (Lucey, 2005). According to Chafey (2003), the manner in which wireless devices (such as mobile phones) are being used has also changed in a relatively short period of time. Consumers are gradually embracing their portable wireless devices as an alternative means to access their bank accounts. The mobile and wireless market has been one of the fastest growing markets in the world and is still growing at a rapid pace.

Mobile Banking refers to provision of banking and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank transactions, to administer accounts and to access customized information (Tiwari and Buse, 2007). 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 Singhe, 2011).

With rapid advance of Internet technologies and diffusion of mobile phones, mobile banking has gained attention as a viable option in delivering financial services. Recent innovations in telecommunications have enabled the launch of mobile banking as a new access method for banking services; whereby a customer interacts with a bank via mobile phone (Barnes & Corbitt 2003).

Banks, like other business organizations, are deploying innovative products and services to ensure their future survival and meet the changing expectation of their customers. In this intense globally competitive market, banks should strive to satisfy the needs of their customers through providing quality customer service and improve their customer relation management. According to Agrawal and Jain (2013), while banks are striving to strengthen customer relationship and move towards “relationship banking” customers are increasingly moving away from the confines

of traditional branch banking and seeking the convenience of remote electronic banking. In this regard Information technology and the communication networking system have revolutionized the working of banks and financial entities all over the world.

The Ethiopian banking industry as a whole has a network of 2,502 branches (NBE,2015), which is the lowest compared to the size of the country (1.1milion square km) and number of population (more than 90 million) and this shows that the number of population being served by a single branch stood at around 34,373(NBE2015).The mobile banking development in Ethiopia is not full-fledged in terms of exhaustively utilizing all the mobile services one can get. Currently, of all the types of mobile banking services, most customers of the bank use notification or alarm inquiry (NBE 2015)

Even though the penetration of mobile phones among the population continues to grow in significant numbers year on year, out of 19 fully operating commercial banks in Ethiopia, there are, currently, seven banking institutions that commence mobile banking as per the Directive No. FIS /01/2012. Moreover, the overall use of mobile phone banking technology to the rural community is not yet started in the country.This show that the banking industry in Ethiopia is back warded in comparison with the current world banking industry advancement and out late offerings. The giant state owned commercial bank of Ethiopia has mobile banking user of 452,053 as of the year 2016 (CBE,2016) This is a very small number compared to the population size of the country and very scattered physical branch of the banks. According to IMF data Ethiopia lag far behind from sub- Saharan African countries in terms of access of finance. (NBE, 2016)

In order to encourage further mobile banking adoption in developing countries, a better understanding of the barriers and drivers impacting M-banking adoption is critical (Zhao et al. 2008). By gaining an in-depth understanding of the factors and conditions that influence developing country's ability to fully adopt and realize its benefits, strategic implications can be generated for the researchers and practitioners regarding how to promote the growth of M-banking in the developing countries. However, despite the importance of these adoption studies in developing countries, limited studies are currently available, especially in Ethiopia. Therefore, more studies are still required to understand the relevance of Mobile banking in Ethiopia to identify areas in which the country lags behind that inhibit their Mobile-banking adoption and

diffusion. Therefore, to address the current gap in the literature; this study is designed to assess Mobile banking adoption in Ethiopian banking industry.

The remaining parts of the chapter are organized as follows. The second section presents statement of the problem. The third section sets out the objectives and hypothesis of the study. The fourth section provides scope and limitation of the study while the fifth section shows the significance of the study .Finally, the structure of the paper is presented in the seventh section.

1.1 Statement of the problem

Around the globe, various initiatives use the mobile phone to provide financial services, not only to those without access to traditional banks but also to the banked population. Yet relatively little scholarly research explores the use of these mobile banking/mobile payments systems (Donner and Tellez, 2008). Scholarly research on the adoption and socioeconomic impacts of mobile banking systems in the developing world is scarce because the systems are so new (Maurer, 2008). Even less attention has been paid to the social, economic, and cultural contexts surrounding the use of these systems.

Out of the nineteen operating commercial banks in Ethiopia, there are, currently, seven banks that have started providing mobile banking services and out of these seven banks Commercial Bank of Ethiopia (CBE) is the leading bank in using mobile banking. Even if CBE has a wide customer base and perform well financially and the penetration of mobile phones among the population continues to grow in significant numbers year after year still the customer's adoption of mobile banking service within CBE still remains low as per NBE Data 2016.

Even if there has been a rapid growth in the adoption of mobile banking by the commercial banks in Ethiopia in recent years, when compared with the banking industry operated in developed country, without doubt the banking industry in Ethiopia is underdeveloped and therefore, there is an all immediate need to go through on capacity building arrangements and modernize the banking system by employing the technologies being used elsewhere in the world.

In today's fast changing world, banking environment has become highly competitive and banks are required to respond quickly to the dynamics of fast changing customers' expectations. To be

able to survive and exceed in this changing market, banks are striving to improve their customer service delivery and productivity through adoption of mobile banking.

As per the NBE, 2016 data even though mobile banking service began operation in Ethiopia in 2010 by Dashen Bank and the service has been in operation for more than six years, the Ethiopian financial sector has not been studied to any great extent, from the perspective of provision of mobile banking. Thus, this study attempts to fill this gap and contributes to the literature on the mobile banking service and seeks to examine the determinants of mobile banking adoption in Ethiopia.

1.2 Research objective and hypotheses

The main objective of the study was to examine the determinants of mobile banking adoption in the Ethiopian banking industry with specific emphasis on Commercial Bank of Ethiopia (CBE).

In order to achieve the broad objective of the study, the researcher developed the following seven hypotheses:

H1: There is a positive relationship between Perceived Usefulness and mobile banking adoption

H2:There is a positive relationship betweenPerceived ease of use and mobile banking adoption.

H3: There is a positive relationship between Perceived credibility and mobile banking adoption.

H4: There is a positive relationship between perceived self-efficacy and mobile banking adoption.

H5: There is a negative relationship between Perceived risk and mobile banking adoption

H6: There is a negative relationship between Perceived cost and on mobile banking adoption.

H7: There is a positive relationship between Relative advantage and mobile banking adoption.

1.3 Scope and limitation of the study

There are only seven commercial banks that have adopted mobile banking as per NBE data and out of those commercial banks that are currently providing the service, CBEhas a wider range of customers and perform financially well therefore the study was carried out on customers of CBE found in the different districts of Ethiopia namely Addis Ababa districts (East, west North and South Addis districts), Hawassa, Shashemene and Adama districts as a representative sampling. The study was limited to these areas because Ethiopia is too large for the researcher to travel all over the country and Addis Ababa is one of the largest and commercial cities in Ethiopia and has a heterogeneous population which ensures a wide spread of potential respondents to the study in addition, Adama, Shashemene and Haassa districts are found near to Addis Ababa so that the researcher can easily travel to these places.

1.4 Significance of the Study

This study would be useful in a number of ways. In particular the study assists economic planners and policy makers in the public sector to understand the factors which influence mobile banking adoption and its impact on people‘s lives. This will help them in formulating policies which will encourage technological innovations as well as adoption in a bid to reduce the poverty levels in the country.

In addition, it assists players in the mobile banking market to understand the factors influencing and challenges affecting mobile banking adoption hence enable them to come up with better services than the existing ones and assist researchers and students of information technology in gaining understanding of the current trends in mobile technologies and their impact. This study will also add to the foundation of knowledge being laid for research in mobile banking technologies.

1.5 Structure of the thesis

The research paper is divided into five chapters. Chapter one is the introduction part, which contain statement of problem, objectives of the study, scope & limitations of the study and significance of the research paper. Chapter two presents the literature review regarding the research area of the paper and sets out the theoretical frameworks for the research. Chapter Three explains the variable selection, theoretical model formulation, hypotheses development andthe methodology used to test the hypotheses. Chapter Four presents the empirical results. Finally, Chapter Five provides the conclusions of the research findings, implications, and recommendations for the future research.

CHAPTER TWO

2. LITRATURE REVIEW

This section seeks to analyze relevant documentation and findings that are essential to improve the research and its capacity to analyze the concerns to accomplish, that is, the theoretical literature and the empirical literature. The theoretical literature presents and attempts to explain theories that relate to the subject matter that is mobile banking adoption. The empirical literature describes what has been practically observed and validated objectively in relation to the subject matter.

2.1 Theoretical Review

The theoretical framework section is the starting point for this chapter. It presents thebackground theories, upon which the study relies. The researcher presents the basic concepts related to mobile banking adoption.

Mobile banking has been defined by (Porteous, 2006) as a subset of electronic banking in which customers access a range of banking products, such variety of savings and credit instruments, via electronic channels. According to Venable Telecommunications (2008), mobile banking can be defined as financial transactions that are based on wireless handsets. They also argue that finance encompasses a wide range of services and products which are of interest to financial services institutions, including mobile banking, mobile payments or funds transfers and mobile commerce, the common element being a handheld wireless device which the customer uses to initiate a transaction. Hence, it involves accessing and providing banking and financial services through a mobile device with the help of mobile telecommunication devices. Mobile banking today is most often performed via SMS or the Mobile Internet, providing two different types of customer account access: a web-based interface and a simple text messaging interface. This therefore means the customer can bank virtually anywhere anytime.

Mobile banking uses a technology referred to as Electronic Data Interchange (EDI). EDI refers to computer to computer exchange of data sent in a form that allows for automatic processing with no manual intervention. It is usually carried out over specialist EDI networks (Lucey, 2005). The use of EDI is widespread especially in finance, banking and retailing. The most

common application of EDI in banking is Electronic Funds transfer EFT. This is a well-established specialized application where computer users send electronic data to their bank giving instructions to make payments or transfer funds between accounts. It is used for paying suppliers, paying salaries etc. An international funds transfer system known as SWIFT (Society for Worldwide Interbank Financial Telecommunications) also exists.

2.1.1 Benefits of Mobile Banking

Mobile banking is one of developing mobile technique used in the commercial domain. It 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.Short message service (SMS) is used to support mobile banking service as the main medium. Reasons for mobile and SMS usage are largely saving time, varying location and convenience (Venkatesh et al, 2003).

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.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.

Convenience, Ubiquitous access and mobility are the main benefits that mobile banking confers to customer (Laforet and Li 2005).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.

With respect to Mobile banking and economic development, an analysis should focus on the means by which Mobile banking can transform, or at a minimum enhance economic growth. The hope is that cell phone banking can contribute greatly to economic development through its ability to crate income generation, enabling more people to access needed financial services in a

cost efficient and relevant way. Over all the rise of cell phone banking is expected to result in substantial macroeconomic benefit resulting from a five to twenty percent reduction of financial exclusion by 2020 across several developing economies (Techcentral, 2012)

2.1.2 Mobile Banking service Models

There are a number of mobile banking models which are evolving and are being adopted by the mobile banking service providers. These models are differentiated based on various issues such as who will establish the customer relationship or who is legally responsible for the deposit, the bank or the non-bank/telecommunications company that is in terms of account opening, handling deposits and lending; whose brand is most exposed to the public; where can the cash be accessed; who carries the payment instructions in terms of whether the service is tied to a particular network or is network independent and basically the nature of agency agreement between the bank and the non-bank agent. However, no matter what business model, if mobile banking is being used to attract low income populations in often rural locations, the business model will depend on the banking agent, that is the retail outlet that will process the financial transaction on behalf of the bank (Porteous, 2006).

Porteous (2006) has defined mobile banking using models which are categorized as Bank-focused (pure bank-driven), Joint Venture (bank-led), Non-Bank-led and Non-bank driven.

The bank-focused model emerges when a traditional bank uses non-traditional low-cost delivery channels to provide banking services to its existing customers. Examples range from use of automatic teller machines (ATMs) to internet banking or mobile phone banking to provide certain limited banking services to the bank‘s customers. This model is additive in nature and may be seen as a modest extension of conventional branch-based banking.

In the Joint Venture model the customer conducts financial transactions through a mobile phone instead of at the bank‘s branches. This model promises the potential to substantially increase the financial services outreach by using a different delivery channel (retailers/ mobile phones), a different trade partner having experience and target market distinct from traditional banks, and may be significantly cheaper than the bank-based alternatives. The model may be implemented by using correspondent arrangements between the bank and a non-bank agent. In this model customer account relationship rests with the bank

The non-bank-led model is where a bank has a limited role in the day-to-day account management and sometimes may not even come into the picture, and the non-bank agent performs all the transactions. Typically the role of the bank in this model is limited to safe-keeping of surplus funds. Account management functions are conducted by a nonbank agent who has direct contact with individual customers

The Non-bank driven model is where the non-bank agent effectively becomes the depository entity through the issuance of e-money. Account ownership and transactions management is done purely by the telecommunication companies.

These differences can be summarized using the following table:

Table 2.1 Mobile Banking ModelsAdopted from Porteous (2006)

Model Name	**Bank-focused**	**Joint Venture (Bank-led)**	**Non-Bank led**	**Non-Bank driven**
Who holds the deposit	Bank	Bank	Bank	Non-bank
Whose brand is dominant	Bank	Joint- non bank agent	Non-bank dominant	Non-bank
Where can cash be accessed	Bank	Bank	Bank and alternative agent network	Non-bank
Who carries the payment instructions	Any Non-bank agent	Specific to one non-bank agent	May be one or any	Specific to offering Telco

2.1.3 Application security in Mobile banking

The main purpose of mobile banking application is to provide customers with access to their bank accounts through their cellular phones. In order to comply with acceptable industry standards for access in to bank account, the first item to consider is the successful authentication of the customer. Once authentication is done, the information that is transported between the bank and the customer's cellular phone needs to be encrypted to eliminate interception by non-authenticated parties. The security approach in cell phone banking application is crucial, because the customer will use the cell phone to access his bank account remotely by utilizing the network reach of his mobile network operator.

The cell phone banking application will allow the customer to view balances in accounts and transfer money from his account to any other bank account, it is of the utmost importance that the cell phone banking application enforce that each transaction can only be executed by the owner of the bank account. Application security in a cell phone banking application must assure none-repudiation of transactions (Laforet and Li, 2005).This implies that there must always be proof that the originator of the transaction was uniquely authenticated before the transaction was processed on the bank account. To assist with proper authentication it is recommended that the approved technology always uses a two-factor authentication mechanism of "something you have"(your cell phone) and "something you know"(your cell phone banking personal identification number)(Manson,2002).

To comply with the first factor of authentication which is "something you have ", it is recommended that the application is designed to ensure that the mobile handset or unique SIM card is always linked to the customer profile during the registration process in the cell phone banking platform. This approach will limit the customer to only access the call phone banking application from his own handset and it will eliminate fraudulent transaction attempts from any available handset and it will eliminate fraudulent transaction attempts from any available handset making it more difficult for fraudsters to compromise the security of the application.

The second portion of the two factor authentication mechanism is a unique PIN that is selected by the customer during the registration process. PIN selection is important to assure that the customer's identity is not comprised. It is recommended that customers select unique cell phone

banking PIN codes, while the application must be designed to not allow weak PIN combinations that follow patterns like 1111, 1234, or 9876. According to security audit best practices regarding a PIN code, the customer must be forced to change his cell phone banking PIN on a regular basis. This is embraced from a security perspective but experience has shown that people tend to have One PIN for multiple applications. For example customers select the same PIN for their bank card as well as for the cell phone banking PIN.

Users experience in various country have indicated that if you continuously force customers to select a new PIN after a certain period of time has elapsed ,customers will become resistant and negative about the product and could even stop using both the card cell phone banking product (Constantinides, 2004). To assure security even further, it is recommended that all transactions with a financial impact is notified to the customer through an alert service. The advantage of a cell phone banking application is the fact that the bank will always have the mobile station integrated services Digital Network or cell phone number(MSISDN) of the customer and it allows the sending of transaction notifications immediately to the customers at the time of transaction through an SMS alert service (Young, 2000)

To support the security of a cell phone banking solution, it is good practice to introduce associated daily limits for the transaction types that will be delivered by the solution. The introduction of daily limits combined with transaction notifications that will notify the customer of fraudulent activity will make cell phone banking less vulnerable for attacks and mitigate the potential fraud risk. It is in the discretion of the bank to determine the value of these limits but the rule of thumb is that it needs to be small enough amounts that discourage fraudsters in attempting to bridge the security of the solution.

2.1.4 Factors affecting Mobile Banking Adoption

Many researchers have been used different theoretical frame works in the study of adopting new technological innovation. Among frameworks that have been developed based on the past studies includes, Technology Acceptance Model(TAM) (Davis, 1989), which posit the two sets of beliefs, i.e., perceived ease of use (PEOU) and perceived usefulness (PU) to determine individual's acceptance of a technology. Theory of Reasoned Action(TRA) (Fishbein & Ajzen 1975), Theory of Planned Behaviour (TPB) (Ajzen 1991), which deals with the intention of

adopting and the factors affect the use technology such as attitude, subjective norms and perceived behavioral control. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkateshet al 2003) Diffusion of Innovations Theory (DIT)developed by Rogers (1995) to explain how the diffusion of innovations takes place in the social system.

2.1.4.1 Technology Acceptance model (TAM)

TAM was developed by Davis (1986) to explain the computer-usage behavior. According to the model, in explaining the adoption of any information system, perceived ease of use (PEOU) and perceived usefulness (PU) are the two most important determinants.

Perceived usefulness: - refers to the degree to which a person that using a particular system would enhance or improve his or her job performance (Davis1 986).

Perceived ease of use: - refers to the degree to which a person that using a particular system would be free from effort (Davis 1986). According to Masrom and Hussein (2008) the adoption of whether to use an information system for a particular individual is very much dependent on the perceived usefulness and perceived ease of use of the information system.

As noted by Davis (1989), future research of Information system (System consisting of the network of all communication channels used within an organization) usage has to address the other variables which affect usefulness, ease of use and user acceptance. Consequently these two determinants may not fully explain the factors which predict the acceptance of a technology application such as mobile banking. Prior studies have extended the original TAM with added constructs such as perceived playfulness (Moon & Kim, 2001), perceived enjoyment (Koufaris, 2002) and perceived credibility (Wang et al., 2003).

Luarn and Lin (2005) extended the existing TAM model by adding four new constructs to understand mobile banking adoption in Taiwan. These are Perceived credibility, Perceived self-efficacy, perceived cost and perceived risk

Perceived Credibility: In mobile banking context perceived credibility is defined as one's judgment on the privacy and security issues of mobile banking (Ba & Pavlou, 2002).Perceived credibility relies on information and reputation as defined by others. Luran & Lin (2005) note the correlation between perceived credibility and the readiness to adopt mobile banking.

Perceived Self-efficacy:.The concept of perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations (Bandura, 1982). The self-efficacy of mobile banking is defined as a judgment of one's ability to use a mobile banking service (Luarn & Lin, 2005) Self-efficacy could include the knowledge, ability and skills needed to use the new Information Technology.

Perceived Cost: The degree to which an individual views that utilizing mobile banking will incur cost is defined as perceived cost (Lurann & Lin 2005). These costs could typically include the cost of the mobile devise, network charges, and transaction charges for bank costs as well as costs for data sent via the network infrastructure

Perceived risk: Perceived risk is viewed as a hesitation regarding the result (good or bad) regarding using a product/service. It is defined as a combination of uncertainty plus seriousness of outcome involved and the expectation of losses associated with purchase acts as an inhibitor to purchase behavior (Bauer, 1960).

2.1.4.2. The Theory of reasoned action (TRA)

The original framework of this model was developed by Fishbein and Ajzen (1975). TRA explained that the actual behavior follows from behavioral intention and that behavioral intention is formed by one's attitude towards behavior and subjective norm (Masrom and Hussein, 2008).

Fishbein and Ajzen (1975) defined attitude towards behavioras the individual's feelings about performing behavior. On the other hand, subjective norm was explained as an individual's perception of whether the behavior should be performed. This would be driven by the motivation that an individual has to comply with opinions from people who are important to the individual (Fishbein & Ajzen 1975).

Behavioral intentions were assumed to indicate how hard people would be willing to try, and how much of an effort they would be planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in behavior, the more likely should be its performance (Sheppard et al. 1988). Subsequent to the original TRA theory, Ajzen (1991) extended the TRA theory establishing theory of planned behavior (TPB).

2.1.4.3. Theory of planned behavior (TPB)

The Theory of Planned Behavior is derived from the Theory of Reasoned Action (TRA).TPB added a perceived behavioral control construct to the TRA. Ajzen (1991) argued that behavioral intention can find expression in behavior only if the behavior in question is under volitional control, (e.g. if the person can decide at will to perform or not to perform the behavior). In many instances behavior would be influenced by non-motivational factors such as availability of resources (Ajzen 1991).

In TPB (Ajzen 1985) a third factor called perceived behavioral control is added. It suggests that the actual behavior of a person is influenced by behavioral intention, and it is influenced by either attitude, subjective norms or perceived behavioral control, or all the factors mentioned above. Attitude refers to the degree to which the person has a favorable or unfavorable evaluation of the behavior in the study, subjective norm refers to the perceived social pressure to perform or not to perform the behavior while perceived behavioral control refers to the individual's belief in the ease to execute behavior (Ajzen 1985).

2.1.4.4. Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed through consolidation of eight models that previous research had employed to explain IS usage behavior. To develop the theory, Venkatesh et al. (2003) firstly reviewed user acceptance literature. This review included the previously discussed theories, TRA, and TAM as well as the motivational model, theory of planned behavior (TPB).

This analysis illustrated that seven constructs appeared to be significant direct determinants of intention or usage (performance expectancy, effort expectancy, and social influence, facilitating conditions, attitude toward using technology, self-efficacy, and anxiety). Of these, Venkatesh et al. (2003) found that the first four constructs played a significant role as direct determinants of user acceptance and usage behavior. Afterwards, a unified model UTAUT was formulated by integrating different elements across the eight models. Using the original data from the aforementioned theories, the UTAUT model outperformed the eight individual models. A subsequent empirical validation using data gathered from two additional organizations confirmed the theory (Venkatesh, et al. 2003).

2.1.4.5. Diffusion of Innovations Theory (DIT)

Diffusion of Innovations Theory (DIT) was developed by Rogers (1983) to explain how the diffusion of innovations takes place in the social system. Mobile banking adoption can be examined using the Technology Adoption Life Cycle (TALC) which describes how new ideas and technologies spread in different cultures. According to TALC the stages by which a person adopts an innovation includes awareness of the need for an innovation, decision to adopt or reject the innovation, initial use of the innovation to test it and continued use of the innovation. Through these stages diffusion is accomplished. There are five different categories of adopters namely innovators, early adopters, early majority, late majority and laggards. Innovators are those people, who want to be the first to try the innovation, are interested in new ideas and are willing to take risks. Early adopters are people who represent opinion leaders; they enjoy leadership roles, embrace change opportunities and do not need convincing for them to change. Early majority adopt new ideas before the average person but they typically need to see the innovation work before they are willing to adopt it. Late majority are people who are skeptical of change and will only adopt an innovation after it has been tried by the majority. Laggards are bound by tradition and are very conservative; hence they fear innovation (Rogers, 1983).

Rogers (1983) 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).

Relative advantage: describes the degree to which an innovation is perceived as being better thanits precursor (Rogers, 1983).According to Kotler (2000) when individuals pass through the innovation-decisionprocess, 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 resultingfrom 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, 1983). This construct is similar to the perceived usefulness in the Technology Acceptance Model, defined as the degree to which a person believes that a particular information technology would enhance his or her job performance.

Compatibility: is defined as the degree to which an innovation is perceived as being consistentwith 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, 1983).The compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (Rogers, 1983). The term compatibility refers to the fact that an innovation is more likely to be adopted when it iscompatible with an individual's job responsibilities and value system (Agarwal and Prasad, 1998).

Complexity:is defined as the degree to which an innovation is perceived to be easy to understandand use. Adoption will be less likely if the innovation is perceived as being complex or difficult to use (Rogers, 1983). Complexity can be considered as the exact opposite of ease of usein the Technology Acceptance model, which has been found to directly impact the adoption of the Internet (Leaderer, et al., 1999).Consumers 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.

Several researches on mobile banking adoption have combined Technology Acceptance Model and Diffusion of Innovation theory (Riquelme & Rios 2010).

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 Wessels and Drennan (2010) extended TAM by adding compatibility and perceived risk as

constructs for their investigation on customer's acceptance of mobile banking. Akturan and Tezcan (2012) have integrated TAM, perceived benefits and perceived risks to investigate mobile banking adoption. 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.

This study therefore combines extended TAM model (Luarn and Lin, 2005) along with Relative advantage to investigate factors influencing mobile banking adoption in commercial bank of Ethiopia. As a result for this study the factors influencing mobile banking adoption are perceived usefulness, perceived ease of use, perceived credibility, Perceived self-efficacy, perceived risk, perceived cost and relative advantage.

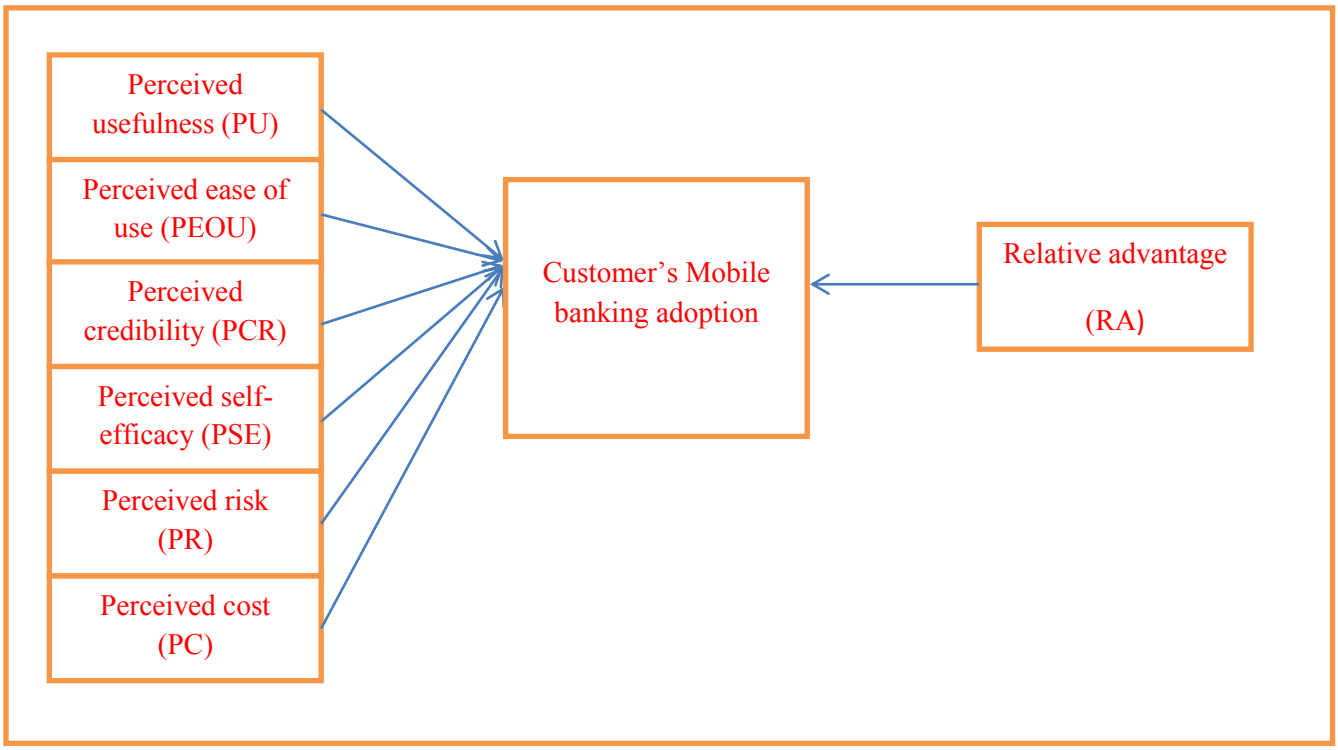

Figure 2.1Model developed by the researcher based on extended TAM model (Luarn and Lin, 2005) and DIT model (Rogers, 2013).

2.2 Empirical studies

2.2.1 Review of previous studies in Ethiopia

Several studies have been conducted to examine the relationship between Mobile banking adoption and its determinants in developed and developing countries. Given the amount of empirical literature available on the topic of this research it would have been quite difficult to present the results of all the studies, therefore here are some of international researches done on mobile banking.

There are some international researches done on mobile banking among them, 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.

Yang(2005),carried out a study"Exploring factors affecting the adoption of mobile banking in Singapore" using Technology acceptance model (TAM) and suggested that apart from TAM factors there were other key factors that affect adoption of this technology. They were "consumer innovativeness, past adoption behavior, technology cluster adoption, age and gender" .The result also mentioned that men are more favorable adopters of mobile commerce technology as opposed to women.

According toLaforet & Li(2005), "Consumers attitudes towards online and 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.

Guet al,(2009) in their study on the determinants of behavioral intension to mobile banking using TAM (Technology Acceptance Model) results showed that behavior is a strong indicator for the

use of mobile banking. Self-efficiency and perceived ease of use had an effect on behavioral intension and trust was based on "structural assurances" that led to an increase in its perceived use.

Mohammad (2013) 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) 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.

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.

Chitungo and Munongo (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.

Esther (2013) conducted a research on Mobile banking adoption in the banking industry in Kenya,this study used a descriptive research design involving multiple case studies on employees of top five commercial banks in Kenya ,Nairobi, namely Kenya Commercial Bank (KCB), Barclays Bank, Standard Chartered Bank, Co-operative Bank and Equity Bank in Kenya, using the model Technology Diffusion innovation theory (DIT).The study sample comprised of 500 bank employees, 100 employees drawn from each bank ranging from junior staff to management, Out of these, 332 responses were obtained. Among the challenges that were identified, it was found that Reliability was the greatest hindrance to mobile banking owing to the fact that for some of the banks their services were inaccessible at times. Availability of substitutes and Accessibility on different networks was also rated highly as impediments to mobile banking adoption. It was also found that most customers feel that the mobile banking services offered by their banks were not significantly different from the ones offered by the telecommunication companies, and given that the ones provided by telecoms were already in existence before banks rolled out theirs hence gained more popularity.

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.

In the context of Ethiopia, a number of studies on mobile banking were adopted. Ayana (2012) studied factors that affect adoption of E-banking in the Ethiopian banking industry. The study was conducted based on the data gathered from four banks in Ethiopia; three private banks (Dashen bank, Zemen bank and Wegagen bank) and one state owned bank (commercial bank of Ethiopia). A mixed research approach was used to answer the research questions that emerge through the review of existing literature and the experiences of the researcher in respect of the E-

banking system in Ethiopia. The study statistically analyzes data obtained from the survey questionnaire. A research framework developed based on technology-organizationenvironment model (TOE) developed by Tornatzky and Fleischer. The result of the study indicated that, the major barriers Ethiopian banking industry faces in the adoption of Electronic banking are: security risk, lack of trust, lack of legal and regulatory frame work, Lack of ICT infrastructure and absence of competition between local and foreign banks. The study suggests a series of measures which could be taken by the banking industry and by government to address various challenges identified. These measures include: Establishing a clear set of legal framework on the use of technology in banking industry, supporting banking industry by investing on ICT infrastructure and banks needs to be focused on technological innovation competition rather than traditional bases of retail bank competition.

Michael (2013) examined the challenges and opportunities of electronic banking in Ethiopia in the case of Dashen and Nib International Banks. The study was conducted based on data collected from staff and customers of the two banks through questionnaires and interviews. The response of interviews and the survey show that there are certain issues that become a challenge for the development of electronic banking in Ethiopia. In this regard, the result of the study indicated that the major challenges for the development of electronic banking in Dashen and Nib International Banks are lack of information, security risk, lack of trust, lack of legal and regulatory framework, lack of infrastructure, shortage of skilled professionals and lack of awareness. The study also identified perceived ease of use and perceived usefulness as benefits for the development of E-banking in Ethiopia. The study suggests a series of measures which could be taken by the two private commercial banks and to address various challenges identified in the study. These measures include: enhancing the awareness level of individuals on E-banking, implementing powerful security programs, establishing a clear set of legal framework on the use of technology in banking industry, supporting banking industry by investing on telecommunication infrastructure and hiring well trained and experienced IT professionals to handle the E-banking business competently with adequate knowledge.

Kalkidan (2016) conducted a research on factors influencing the usage of mobile banking in Ethiopia. The study usedTechnology Acceptance Model (TAM) andInnovation Diffusion Theory (IDT) by integrating perceived risk, trust and awareness into the established models. This study

was conducted based on the data gathered from customers of Commercial Bank of Ethiopia and United Bank in Addis Ababa, Ethiopia. Survey was conducted using questionnaire. The research results found relative advantage, compatibility, perceived trust, perceived usefulness, and perceived risk as major influencing factors for mobile banking adoption whereas perceived ease of use and awareness 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 campaigns and arranging information sessions to demonstrate the features of mobile banking services, and its benefits over traditional channels.

2.3. Conclusions and knowledge gap

The adoption of mobile banking has been gradually increasing with the rapid increase in the use of mobile or wireless handsets in the recent past. Studies conducted in the early 2000 showed that European countries including Scandinavian countries, France, UK, Ireland and Germany, alongside Canada and Japan were among the leaders in mobile banking. In some Asian countries (Singapore and Malaysia) mobile banking penetration was on the increase whereas Australia and New Zealand were among the slow adopters. There was no reference to Africa considering it is a developing continent and mobile banking was still very new in the technology world. However, other studies conducted in mid 2000s showed that mobile banking had grown faster in Sub-Saharan Africa than in most other parts of the world within a relatively short time, and was expected to continue increasing (International Telecommunications Union, 2005).

Studies were conducted in different countries .Some of these studies includes Yang (2005), carried out a study"Exploring factors affecting the adoption of mobile banking in Singapore" Laforet & Li (2005), "Consumers attitudes towards online and mobile banking in china",Gu et al, (2009) conducted a study on determinants of behavioral intension to mobile banking, Esther (2013) conducted a research on Mobile banking adoption in the banking industry in Kenya and an empirical study that was conducted on the factors that affect the Malaysian customers from adopting mobile banking services by Cheah et al (2011). In the context of Ethiopia, however, to the knowledge of the researcher, there appears to be limited evidence on factors affecting adopting of mobile banking but some of related studies are: The opportunities and challenges of e-banking in Ethiopia (Garedachew, 2010), the challenges and opportunities of electronic banking in Ethiopia in the case of Dashen and Nib International Banks,(Michael ,2013) , factors

affecting adoption of e-banking system in Ethiopian Banking industry(Ayana ,2012). However as far as the researcher knowledge is concerned one study,factors influencing usage of mobilebanking in Addis Ababa by (kalkidan 2016) has been conducted but the study covered only Addis Ababa city and did not include users' perception of other regional areas in addition perceived self-efficacy and perceived cost which are major factors of mobile banking adoption were not studied.

CHAPTER THREE

3. RESEARCH METHODOLOGY

In the previous chapter, the literature review, which shows the theoretical framework for the study and review of issues related with factors affecting adoption of Mobile-banking, has been presented. This chapter outlines and explains the methodology employed to achieve the research objective and test the research hypotheses formulated in the study. It starts by explaining the research objective and hypothesis development .The second section provides a brief overview of the research approaches followed with the methodology adopted in the study, which in turn includes population, sampling design and actual data collection tools in the third section. The fourth section discusses about data presentation and analysis techniques used in the study. The last section presents the model and variable descriptions for the model adopted in the study.

3.1. Research objective and development of hypotheses

The major objective of this study is to investigate the perceived determinants of mobile banking adoption in Ethiopia, A case of Commercial bank of Ethiopia.

In line with the broad purpose statement seven hypotheses was formulated.

Perceived usefulness: Bhattiet.al (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.

Based on the above rationale, the following hypothesis is formulated

H1: Perceived usefulness will have a positive effect on mobile banking adoption.

Perceived ease of use: Prior studies have also shown while the direct effects of perceived ease of use remain important over time, the indirect effect of perceived ease of use becomes stronger (Venkatesh & Morris, 2000). A system which is easier to use will facilitate more system use and task accomplishment than systems that are hard to use (Venkatesh& Morris, 2000). Therefore, a

positive relationship between perceived ease of use and mobile banking adoption is expected in relation to the study.

H2: Perceived ease of use will have a positive effect on mobile banking adoption.

Perceived credibility or Compatibility: an innovation can be compatible or incompatible with socio-cultural values and beliefs with previously introduced ideas or with client needs for innovations (Rogers, 1983).The compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (Rogers, 1983). Based on this the following hypothesis is formulated

H3: Perceived credibility will have a positive effect on mobile banking adoption.

Perceived Self-efficacy: This variable is referred in prior research (extended TAM, Luarn & Lin, 2004).The concept of perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations (Bandura, 1982). Self-efficacy could include the knowledge, ability and skills needed to use the new information technology. Therefor the following hypothesis is formulated.

H4: Self-efficacy will have a positive effect on mobile banking adoption.

Perceived risk: Risk or uncertainty regarding the most appropriate purchase decision or the consequences of the decision is a significant variable influencing the total amount of information gathered by consumers (Loudon and Bitta, 1993). Based on the literature, perceived risk may directly influence user intention to use mobile banking and the following hypothesis is formulated:

H5: Perceived risk will have a negative effect on mobile banking adoption.

Perceived cost: According to Ching and Ellis (2004) adoption will be driven by the perceived costs and benefits inherent in the particular innovation. The cost of an innovation has many components initial investment costs, operational costs, and utilization costs. Rothwell and Gardiner (1984) observe that there are two fundamental sets of factors affecting user needs, namely price factors and non-price factors. To this extent Gupta (1988) identifies price as a major factor in brand switching. If consumers are to use new technologies, the technologies must

be reasonably priced relative to alternatives. Otherwise, the acceptance of the new technology may not be viable from the standpoint of the consumer**.**

This variable was used in prior research on mobile banking adoption (extended TAM, Luarn & Lin, 2004).

Based on the literature, perceived cost was likely to directly influence the user's intention to use mobile banking therefore the following hypothesis is formulated:

H6: Perceived cost will have a negative effect on mobile banking adoption

Relative Advantage: Gerrard and Cunningham (2003) identify a perceived relative advantage as being a significant factor driving the adoption of internet 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.Likewise, in this study a positive relationship between relative advantage and mobile banking adoption is expected

H7: Relative advantage will have a positive effect on mobile banking adoption.

3.2. Research approaches

The research approach implicitly reflects the researcher attitude as to how knowledge is constructed and also commands what method to be employed in the study. According to (Creswell 2009), there are three research paradigms; these are quantitative research, qualitative research, and mixed research based their assumption towards knowledge creation on post-positivism, social constructivism and pragmatic philosophical grounds respectively.

However, the author also noted that the selection of a research design involves the considerations of the worldview assumptions the research brings to study, the nature of research problem, procedures of inquiry, the researcher's experience, audiences for the study, and data collection methods, analysis and interpretation. Thus, the following sections reviewed the aforementioned characters for each type of research designs in which it helped to adopt the fitted research method for this study.

Quantitative research: this approach is based upon an empirical cycle that has a deductive nature. The researcher often uses an established theory to develop the hypothesis to be tested. Jonker and Pennink (2010) contended that the essence of quantitative research is to use a 'theory' to frame and thus understand the problem at hand. Quantitative purists believe time and context free generalizations are desirable and possible, and real causes of social scientific outcomes can be determined reliably and validly (Johnson and Onwuegbuzie 2004). It is grounded in the basic attitude that knowledge about reality can also be obtained 'through the eyes of the researcher'. It is he who elaborates theory based on findings. In order to make thishappen, theory is most often translated into a conceptual model and elaborated predominantly by means of hypotheses. For the researcher conducting quantitative research it implies the need to carefully operationalizing a theory and subsequently measuring it by means of variables and questions.

Qualitative research: is an inquiry process of understanding where the researcher develops acomplex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting (Creswell 2002). In this approach, the bottom up orinductive exploratory method is used; it is used primarily for the purposes of description and exploration and to gain an understanding of how people think and experience their lives. In qualitative research, data is collected from those immersed in everyday life of the setting in which the study is framed. It is based on qualitative data which during analysis are examined for patterns, themes, and holistic features. A narrative report is presented and generalization is usually not a goal because the focus is on the local, the personal, and the subjective.

Mixed research:is the third and newest research methodology paradigm. It tries to mix the best of qualitative and quantitative research into research studies. Philosophically, mixed research takes an eclectic, pragmatic, and commonsense approach, suggesting that the researcher mix quantitative and qualitative in a way that works best for the given research question being studied in a particular context.

Mixed research uses both deductive and inductive methods, obtains both quantitative and qualitative data, attempts to corroborate and complement findings, and takes a balanced approach to research. A mixed methods approach is one in which the researcher tends to base

knowledgeclaims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic).

It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problem. The data collection also involves gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information (Creswell 2009).

The following section hence presents the methods adopted in the study

3.3. Research approach adopted

The major objective of this study is to assess the perceived determinants of mobile banking adoption in Ethiopian banking industry in the case of CBE based on factors which are found to be significantly influence adoption of mobile banking in prior studies.The research problem tends to be explanatory which seeks to explain the relationship between mobile banking adoption and its determinant factors. Therefore, quantitative research design is appealing for this study to achieve the objectives of the study and to test the hypothesis.

Jonker and Pennink (2010) contended that the essence of quantitative research is to use a 'theory' to frame and thus understand the problem at hand. Quantitative purists believe time and context free generalizations are desirable and possible, and real causes of social scientific outcomes can be determined reliably and validly (Johnson and Onwuegbuzie 2004). It is grounded in the basic attitude that knowledge about reality can also be obtained 'through the eyes of the researcher'.

Surveys are an important research tool to gather peoples thought and behavior therefor the study adopted a quantitative research approach by using a survey design.

3.3.1. Population & Sampling Design

Since the study was conducted about mobile banking adoption, those banks that have implemented this technology have been considered as the target population. Out of these banks Commercial Bank of Ethiopia found to have the largest percentage of mobile banking user (NBE 2016) and performs well financially. As the data obtained from the Management Information System directorate of the Commercial Bank of Ethiopia, by March 1, 2017 there were 452,053

mobile banking users at the Commercial Bank Ethiopia.Therefore the population of the study will be customers of commercial banks of Ethiopia who are using mobile banking.

An optimal sample size is important to draw meaningful deductions in a study. A large sample size can become administratively unwieldy to handle while a small one could give inaccurate results. It is therefore vital to select a sample size that determines a statistically significant outcome. It is also important to ensure that the sample selected an unbiased opinion.

Based on the formula of Yamane (1967) the sample size will be:

$$n = N/(1+N(e^2)$$

$$= 452,053/ (1+452,053 (0.05^2)$$

$$= 399.65 \approx 400$$

Therefore, out of the 452,053 mobile banking customers the researcher selected 400 customers randomly. To create a genuine representation of the fact, the researcherused the already existing category of CBE, which is by district. The bank has 16 districts, out of which 15 districts have mobile banking customers. Among the 15 districts the researcher used randomly selected customers found in Addis Ababa districts (East, west North and South Addis districts), Hawassa districts, Shashemene district and Adama district as a representative sampling.

Since the total coverage of mobile banking users in these seven districts accounts 231,470 which is approximately 51.2% of the total population the researcher thinks that this sample is enough to represent the entire population.

The study was limited to these regional areas because these regions are the only places that were convenient for the researcher to conduct the survey taking time and cost in to account.

Table 3.2Commercial bank of Ethiopia Mobile banking users by Districts

District	Population	Sample
Adama District	28,462	49
Bahirdar District	39,685	-
Dessie District	13,051	-
Dire Dawa District	42,858	
East Addis District	39,916	69
Gonder District	27,594	-
Hawassa District	28,905	50
Jimma District	20,532	-
Mekele District.	32,014	-
Nekemet District	27,695	-
North Addis District	44,663	77
Shahsemene District	13,349	13
South Addis District	39,460	68
West Addis District	36,715	64
Wolaita Sod District	17,154	-
Grand	**452,053**	**400**

Source: (Dec 2016) MIS report

3.3.2. Instrument design and actual conduct of the survey

The research instrument used in the study was questionnaire, which was structured based on prior research and the literature review. Most of the questionnaire was taken from the study conducted by Esther (2013),Gu et al (2009), Lin (2011), Shi (2009) yet the researcher modified the questions to be consistent with research objective and intended respondents and add some questions. The questioner was comprised of close-ended questions developed on a five point Likert scales ranging from 5 (strongly agree) to 1 (strongly disagree).Background questions about respondents were also included in the instrument.

In order to check the appropriateness of the questionnaire's questions to the study's main objective, and to examine validity of the research instrument, the questionnaire has

beenpresented to a group of specialized people and experts in related subjects. They proposed some adjustments and suggested some necessary correction to ensure improvement of the validity of the instruments. The questionnaire was subsequently amended in accordance with their instructions and recommendations. Approval of the majority of the experts was considered indicative of the questionnaires validity.

The researcher delivered the questionnaires to the selected regional area districts (Adama, Shahemene and Hawasa) for staffs of CBE. Since the staffs of CBE are also customers of CBE, the researcher used these respondents save time and cost .For the districts of Addis Ababa the researcher delivered the questionnaires using convenience sampling to selected customers of CBE mobile banking users and after filling the questionnaires, the respondents were asked to drop to the bank tellers and the researcher returned back to collect them.

Reliability of an instrument is testing for both consistency and stability. Consistency indicates how well the items measuring a concept hang together as a set (Sekaran & Bougie, 2010). The role of reliability is to reduce the errors and biases in a study (Yin, 1994). Also according to Chisnall (1997), reliability is concerned with consistency, accuracy and predictability of specific research findings.

Cronbach's alpha is a reliability coefficient that indicates how well the items in a set are positively correlated to one another. The closer Cronbach's alpha is to 1, the higher the internal consistency reliability and the greater the reliability of the instrument according to Sekaran and Bougie (2010). The researcher used Cronbach's alpha in order to measure the reliability of the information and results obtained through the questionnaire. Sekaran and Bougie (2010) stated that reliabilities that are less than 0.60 are considered poor, those in the 0.70 range are acceptable, and those more than 0.80 are excellent. This is the scale that the researcher relied upon to determine the reliability of the factors.

3.4. Data Analysis

Data from the field was compiled, sorted, and coded to have the required quality, accuracy and completeness. Data was entered into the computer system using the Statistical Package for Social Sciences (SPSSv23) for analysisIn generating the actual results, frequency tables were generated to determine the number of respondents who expressed their opinion on a particular item. Based on the frequency tables generated, descriptive statistic was used to analyze and describethe findings.Logistic regression analysis was also carried out to determine extent to which independent variables influence the dependent variable

3.4.1. Definition and measurement of Variables

Dependent Variable: Mobile Banking Adoption.

In this study the predictor variables are users' income influence, banks advertisements, security concerns, users' attitude towards technological change and whether or not customers are active mobile banking users and they are measured by 0 or 1 which takes the value ofYes or No.

Perceived usefulness: is the extent to which an individual believes that he or she would benefit from using mobile banking (Davis1 986).In this study minimizing number of customers who come to the bank hall and accessing the bank account with no time limit are the predictors of perceived usefulness and they are measured by the level of agreement from 1 to 5(strongly disagree to strongly agree).

Perceived ease of use is the degree to which a person believes that using a particular system would be free of effort (Davis1 986).The predictors for perceive ease of use applied in this study are guidelines provide by the bank, how simple is the registration process and how easy is learning mobile banking and measured by the level of agreement from 1 to 5(strongly disagree to strongly agree).

Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences and the needs of potential adopters (Chen et al. 2004)Compatibility of the service with the way of users beliefs is the proxy for perceived credibility measured by the level of agreement from 1 to 5(strongly disagree to strongly agree).

Perceivedself-efficacy of mobile banking is judgment of one's ability to use a mobile banking service (Luarn & Lin, 2004).Users capability to use the service is the proxy for perceived self-efficacy measured by the level of agreement from 1 to 5(strongly disagree to strongly agree).

Perceived riskis the uncertainty about the outcome of the use of the innovation (Gerrard and Cunningham 2003).The predictors for perceived risk applied in this study are loss of trust with the technology provided by the bank, fear of leaking personal information and fear of losing money if the phone is stolen measured by the level of agreement from 1 to 5(strongly disagree to strongly agree).

Perceived Cost isthe degree to which an individual views that utilizing mobile banking will incur cost (Lurann & Lin 2005). Cost of mobile phone and cost of using the services are the predictors of perceived cost and measured by the level of agreement from 1 to 5(strongly disagree to strongly agree).

Relative advantage describes the degree to which an innovation is perceived as being better than its precursor (Rogers, 1983).In this study accessibility of mobile banking other than other banking options, convenience and time saving are the predictors of relative advantage measure by the level of agreement from 1 to 5(strongly disagree to strongly agree).

3.4.2 Model Specification

The construction of qualitative choice models in which the dependent variable takes on a dichotomous or polychotomous character, have been applied to economic, business and marketing analysis (Greene, 2003). Generally, the purpose of qualitative response models is to determine the probability (likelihood) that a decision maker, with a given set of attributes, makes one choice rather than the alternative (Liao, 1994).

Amemiya (1981) suggested that using qualitative choice modeling in economic and behavioral research has become more important because of the existence of many discrete variables. Ennew and Binks (1996) use a logit model to identify factors affecting bank customer retention and defection. Gan et al. (2006) apply a logit analysis to examine the consumers' choice of banking channels in New Zealand. In addition, Clemes, et al. (2010) use logistic regression to analyze the factors that impact on Chinese customers' bank switching behavior. Gounaris and Koritos (2008)

also employ logistic regression analysis to investigate the drivers of theInternet banking adoption decision in Greece.

In this study, whether an individual chooses to adopt mobile banking or not adopt mobile banking falls into the realm of qualitative choice.Qualitative choice models are used to compute probability of choices being made, and they attempt to relate the probability of making a particular choice to various explanatory factors (Sellar et al, 1982).Probabilities have to be betweenzero and one. Using linear probability model and ordinary least squares (OLS) is not preferable due to the return of probabilities outside the unit interval (Stynes and Peterson, 1984). In addition, the use of a linear probability model causes heteroscedastic errors and as a consequence, t-tests of significance are not valid (Miller and Hay, 1981). Therefore, it is preferable to use either a logit or probit model.

The Logistic regression based on previous model designed by (Train,1993) was modified using the variables from the above conceptual framework and is stated as follows:

MBA=f (PU, PEU, PCR, PSE, PR, PC, RA, ε)

Where:

MBA =the dependent variable which identifies whether an individual has adopted or not adopted mobile banking.

PU= Perceived Usefulness

PEU= perceived ease of Use

PCR=perceived Credibility

PSE=perceived Self-Efficacy

PR=perceived Risk

RA=Relative Advantage

ε = Error term

To summarize, this chapter deals with the main determinants of mobile banking adoption, the type of data used and the techniques employed to collect the data, the sampling mechanism including sample size, the methods utilized to manage and analyze the data, and the process of constructing empirical model with identification and measurement of its components, measurement and selection of variables, expected relations between the dependent and independent variables.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

This chapter consists of empirical data presentation and discussion presented under the respondents' demographics, the services being offered under mobile banking and how frequently they are used by bank customers, factors affecting mobile banking adoption by customers of CBE.

This chapter presents the descriptive analysis on variables of the study and results of regression analysis that constitute the main findings of this study.

4.1. Results

This study had a sample size of 400 respondents. Out of these, 369 responses were obtained. This represents a 92.25% response rate.

4.1.1Respondents Profile

Table4.1 Gender

	Frequency	**Percent**
Male	207	56.1
Female	162	43.9
Total	369	100

Source: Survey results and own computation

According to the findings 43.9% of the respondents indicated that they were females while 56.1% indicated that they were males. This shows that majority of the respondents were males

Table 4.2Respondents' Age

	Frequency	Percent
18-25	78	21.1
2-35	134	36.3
36-45	82	22.2
46-55	48	13
55^{+}	27	7.3
Total	369	100

Source: Survey results and own computation

According to the age variable, the highest percentage of mobile banking adopters is between 26 years and 35years old.

Table 4.3 Respondents' Educational level

	Frequency	Percent
High school completed	99	26.8
Diploma	36	9.8
Degree	159	43.1
Maters and above	51	13.8
others	24	6.5
Total	369	100

Source: Survey results and own computation

From the 369 respondents, 159(43.1%) had a university degree .This was followed by 99(26.8%) respondents who only had a matric qualification, 51(13.8%) respondents had masters and above, 36(9. 8%) who had a diploma and 24(6.5%) who specified others.

Table 4.4 Respondents' Occupational status

	Frequency	Percent
Student	64	17.3
Employed	155	42.0
Self-Employed	132	35.8
Unemployed	18	4.9
Total	369	100

Source: Survey results and own computation

Based on the results in *Table 4.4* regarding occupational status, the highest percentage (42%) of respondents are employed, followed by 35.8% respondents which are self-employed, 17.3% who are students, and 4.9% respondents are unemployed.

Table 4.5Respondents' Monthly income

	Frequency	Percent
0-1650	15	4.1
1652-3200	28	7.6
3201-5250	46	12.5
5251-7800	76	20.6
7801-10900	80	21.7
>10900	124	33.6
Total	369	100

Source: Survey results and own computation

Based on the results in *Table 4.5*which was related to the income variable, the highest percentage (33.6%) of respondents earns greater than 10,900 ETB, followed by 21.7. % who earn between 7801-10,900 ETB, followed by 20.6% who earn between 5251 to 7800 ETB, followed by 12.5% who earn between 3,201-3,250ETB,followed by 7.6% who earn between 1,651-3,200ETB and finally 4.1% who earn less than 1,650 ETB.

Table 4.6 Respondents' Registration status

	Frequency	Percent
Less than one year	145	39.3
Greater than one year	224	60.7
Total	369	100

Source: Survey results and own computation

According to the results on *table 4.*6, 60.7% of the respondents were using mobile banking greater than one year and 39.3% were using for less than one year.

Table 4.7 Respondents' Influence to Register

	Frequency	Percent
Advertisement	136	36.9
Family/Friends	141	38.2
Bank's policy	79	21.4
others	13	3.5
Total	369	100

Source: Survey results and own computation

According to the responses from those who had signed up for mobile banking, 38.2% indicated that they were influenced by family and friends to sign up, 36.9% indicated that they were influenced by media advertisements, 21.4% indicated they were influenced by bank's policy and 3.5% indicated that they were influenced by other sources some of which included personal decision to sign up. This, therefore, shows that family and friends and advertisements had the greatest influence on the respondents' decision to sign up.

4.1.2 Descriptive statistics

This section is divided into two parts. The first part presents the descriptive analysis of using mobile banking services provided by CBE and the second part of the descriptive analysis investigates the variables of the study.

4.1.2.1 Usage of Mobile Banking Services

Understanding the frequency with which certain services provided under mobile banking are used by customers is important and provides useful feedback for management of banks. This is because it could give an indication whether the service is meeting customer needs or not, whether customers know how to use the particular service and simply whether it adds value

providing it or not. To measure frequency of use of mobile banking services, customers were asked to rate how frequently they used the services ranging from never to always on a numerical scale of 1-5. The results of the respondents rating were as shown in the table below

Table 4.8 Survey findings of usage of mobile banking services

	No of Respondents	Mean	Std. Deviation	Minimum	Maximum
Balance inquiry	369	3.74	.996	1	5
Own Account Transfer	369	1.72	.968	1	4
Transfer to your beneficiaries	369	1.84	1.019	1	4
Payment to others	369	2.35	1.315	1	5
Local money transfer	369	1.00	.000	1	1

Source: Survey results and own computation

As shown in the above table the means of customers' responses on respective statements ranged between 1and 3.74.The highest mean, 3.74 dictates that most of the respondents used the service balance inquiry often. The second major service rarely used by the customers' is payment to others with a mean of 2.35. 'Transfer to your beneficiaries' and 'own account transfer' are placed 3rd and 4th rank as per customers response and finally since customers had never used local money transfer (transfer to any non CBE customers) this service was least ranked.

This information is important in that it could be used by management to determine whether the least used services add any value or to embark on a fact finding mission from customers on their opinion of the services, and make the relevant decisions.

4.1.2.2Factors Influencing Adoption of Mobile Banking in Ethiopia

It is important for mobile banking service providers to understand the factors which influence or affect the adoption of mobile banking in order to be able to provide services which meet the customers' expectations and needs. Bank customers were also requested to rate how important the identified factors were in influencing their decision to sign up for mobile banking ranging from strongly Disagree to Strongly Agree on a numerical scale. The results of the responses were as shown in the table below:

Table 4.9Response of respondents on perceived usefulness, perceived ease of use, perceived credibility, perceived self-efficacy, perceived risk, perceived cost and relative advantage

	No of Respondents	Mean	Std.Deviation	Minimum	Maximum
Perceived Usefulness	369	3.8383	.73519	1.00	5.00
Perceived ease of use	369	3.8001	.74650	1.25	5.00
Perceived Credibility	369	2.8869	.93862	1.25	5.00
Perceived Self-Efficacy	369	3.2331	.68183	1.75	4.50
Perceived Risk	369	2.6414	1.13942	1.00	5.00
Perceived cost	369	2.2150	.89323	1.00	4.67
Relative Advantage	369	3.8473	.88458	1.33	5.00

Source: Survey results and own computation

From the above table based on the average mean score calculated from the customers' responses, the respondents agreed that Relative advantage is the major factor that affects adoption of mobile banking. The second major factor is perceived usefulness. Perceived ease of use and perceived self-efficacy are placed 3rd and 4th rank as per the customers' responses. The 5th and the 6th factors which influences customers adoption of mobile banking is perceived credibility and

perceived risk and in this study perceived cost is the least factor that affects mobile banking adoption.

4.1.2.3 Mobile banking Adoption factors

Table 4.10: Response of respondents on Mobile Banking Adoption.

		Response	Frequency	Percent
MBA 1	Are you using mobile banking regularly after you signed up for the service?	"YES"	259	70.2%
		"NO"	110	29.8%
MBA 2	Did your mobile phone support mobile banking at the time you signed up the service?	"YES"	246	66.7%
		"NO"	123	33.3%
MBA 3	Did you have to purchase a phone that supports the service?	"YES"	128	34.7$
		"NO"	241	65.3%
MBA 4	Does your income influence your use of mobile banking?	"YES"	229	62.1%
		"NO"	140	37.9%
MBA 5	Are there any security concerns that have been raised concerning your bank's mobile banking services	"YES"	235	63.7%
		"NO"	134	36.3%
MBA 6	Do you find your bank's	"YES"	183	49.6%

	advertisements on mobile banking appealing or interesting enough to encourage customers to sign up?	"NO"	186	50.4%
MBA 7	Does your attitude towards change (how you perceive change) affect your use or uptake of mobile banking	"YES"	254	68.8%
		"NO"	115	31.2%

Source: Survey results and own computation

According to the table above 70.2% of the respondents are using mobile banking regularly after they signed up for the service. When signed up the service 66.7%, of the respondents had mobile phone that supports the service and 34.7% of the respondents had to purchase a mobile phone that supports the service. 62.1% of the respondents thought their income influence their usage of mobile banking. When asked about security problem, 63.7% of the respondents mentioned there were security concerns that have been raised while using mobile banking. 50.4% of the respondents did not think the bank's advertisement on mobile banking was not interesting enough to encourage and 68.8% of the respondents thought their attitude towards change affects their usage of mobile banking.

4.1.3. Regression results

The following sections discuss results of the diagnostic tests (i.e. Multicollinearity and logistic Regression Analysis.)

4.1.3.1Multicollinearity

Multicollinearity represents the degree to which any variable's effect can be predicted or accounted for by the other variables in the analysis. When multicollinarity arises, the ability to define any variable's effect is diminished (Hair et al., 2010). Logistic regression does not accept multicollinearity as the high interrelationship of the independent variables can cause the inflation

of the standard error of the logit coefficients (Garson, 2010). The acceptable level of correlation between each pair of the independentvariables should be at 0.80 or less (Bryman and Cramer, 1999).

Table 4.11 Correlation Matrix

	Constant	*PU*	*PEU*	*PCR*	*PSE*	*PR*	*PC*	*RA*
Constant	*1.000*	-.289	-.423	.292	-.469	-.195	.094	-.577
Perceived usefulness(PU)	-.289	*1.000*	-.331	-.541	.094	-.039	-.147	.114
Perceived ease of use(PEU)	-.423	-.331	*1.000*	-.316	.057	.229	-.202	.174
Perceived credibility(PCR)	.292	-.541	-.316	*1.000*	-.362	.019	.339	-.294
Perceived self-efficacy(PSE)	-.469	.094	.057	-.362	*1.000*	-.229	-.211	.257
Perceived risk(PR)	-.195	-.039	.229	.019	-.229	*1.000*	-.323	-.085
Perceived cost(PC)	.094	-.147	-.202	.339	-.211	-.323	*1.000*	-.258
Relative Advantage(RA)	-.577	.114	.174	-.294	.257	-.085	-.258	*1.000*

Source: Survey results and own computation

The Person Correlation Matrix was used to inspect the correlation between the independent variables. The result (Table 4.11) shows that the correlations are all below 0.80, indicating no multicollinearity problems were found in the regression model.

4.1.3.2Logistic Regression Analysis

Table 4.12a Logistic Regression results

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	312.698[a]	.310	.440

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

The correlation coefficient R is a statistical technique that shows whether and how strongly pairs of variables are related to each other. According to cohen (1992) R-square value .12 or below indicate low, between .13 to .25 values indicate medium, .26 or above values indicate high effect sizes.Therefore, the explained variation in the dependent variable based on the model ranges from 31% to 44%.since Nagelkerke R^2 is a modification of Cox & Snell R^2it is preferable to report Nagelkerke R^2 value =44% which means that 44% of the changeability of mobile banking adoptionhas been explained by the independent variables taken together

Table 4.13b Logistic regression results

Variables in the Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Perceived usefulness	.422	.269	2.454	1	.007***	1.525	.899	2.585
	Perceived ease of use	1.268	.262	23.431	1	.000***	3.554	2.127	5.940
	Perceived credibility	1.710	.256	44.521	1	.112*	.181	.109	.299
	Perceived self-efficacy	.793	.231	11.816	1	.001***	2.210	1.406	3.474
	Perceived risk	-.361	.169	4.600	1	.032**	1.435	1.032	1.997
	Perceived cost	-.297	.190	2.430	1	.119*	.743	.512	1.079
	Relative advantage	.735	.165	19.944	1	.000***	2.086	1.511	2.881
	Constant	5.688	1.207	22.216	1	.000***	.003		

a. Variable(s) entered on step 1: Perceived usefulness,perceived ease of use, perceived credibility, perceived self-efficacy, perceived risk, perceived cost, and Relative advantage.

Scale: 1-strongly disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-strongly Agree

***, **, * ==> Significance at 1%, 5%, 10% level

As table 4.12 shows, perceived usefulness were found to have statistically significant and positive relation with mobile banking adoption in Ethiopia. There is also a positive significant relationship between the perceived ease of use and mobile banking adoption.Holding other explanatory variables constant perceived credibility has emerged in this study statistically insignificantinfluence on customers adoption of mobile banking adoption as its value of significance is greater than 0.05.There is a positive significant relationship between perceived self-efficacy and mobile banking adoption. A negative significant relationshipbetween perceived risk and mobile banking adoption was created. Perceived cost has also emerged in this study as statistically insignificant influence on customers adoption of mobile banking as its value of

significance is greater than 0.05 andRelative advantage has a significant positive effect on mobile banking adoption.

4.2 Discussions of regression results

Section 4.2 presented mainly the outputs of factors affecting mobile banking adoption in Ethiopia. Accordingly, the following sub sections discuss the results of the research hypotheses presented in chapter three.

The selected perceived determinant factors are perceived usefulness, perceived ease of use, Perceived credibility/Compatibility; perceive self-efficacy, perceived risk, and perceived cost and relative advantage.

4.2.1 Perceived usefulness and mobile banking adoption

Perceived usefulnesswas considered to be one of the key factors that can affect mobile banking adoption in Ethiopia. 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.

This result is found to be in line with (Luarn and Lin, 2005) finding that states perceived usefulness having a positive influence in mobile banking adoption. (Wang et.al 2003) also agree that most customers choosing mobile services because they see their benefits. Therefore the possible reason for the significant positive relationship could be most users in Ethiopia choose to adopt mobile services because they see the benefits they could obtain and also the convenience and any time anywhere accessibility.

4.2.2 Perceived Ease of Use and mobile banking adoption

In terms of the impact of perceived ease of use on mobile banking adoption in Ethiopia, as shown in the results section, this study found a positive and statistically significant relationship between the two. This finding was consistent with the results by (Khalifa and Shen 2008, Kim et al 2009; Wei et al. 2009) that stated in previous empirical studies that perceived ease of use has a positive influence in the usage of mobile banking.

4.2.3 Perceived credibility and mobile banking adoption

Perceived credibility of mobile banking was found to be statistically insignificantinfluence on users' adoption of mobile banking in Ethiopia.

This result did not confirms the previous researches by (Koenig-Lewis 2010; Lin 2011) that found perceived credibility /compatibility to be influential in the adoption of mobile banking. This finding could imply that users in Ethiopia perceive mobile bankingconsistent with their existing beliefs, values, lifestyle and past experience.

4.2.4 Perceived self-Efficacy and mobile banking adoption

This study found Perceived self-efficacy and mobile banking adoption was found to have a positive significant relationship. Therefore the result of the study is consistent with prior researches by (extended TAM, Luarn & Lin, 2004) that found perceived self-efficacy to be influential in the adoption of mobile banking.

This implies that in Ethiopia, users' knowledge, ability and skills are needed to use the new information technology.

4.2.5 Perceived Risk and mobile banking adoption

According to the results of this study, in Ethiopia, factors which hamper mobile bankingusage are: consumers believe that it is not safe to use mobile banking; consumers believe that it is unsafe to reveal personal information. This finding show that the lower the perceived risks of mobile banking the more likely an individual would be prepared to become active users of mobile banking. Therefore the perceived risk negatively influences consumer behavior with regard to mobile banking.

This finding was found to be consistent with Luo et al. (2010); Mitchell (1999), Safeena, et al., (2011); Laforet and Li, (2005); Luarn and Lin, (2005); Mallat (2007) and Gu et al., (2009) that found perceived risk is one of the critical factors to be focused while designing and developing a mobile banking service.

4.2.6 Perceived cost and mobile banking adoption

In the context of Ethiopia, Perceived cost as found to be statistically insignificant influence on customers adoption of mobile banking and this finding as inconsistent with prior research on mobile banking adoption (extended TAM, Luarn & Lin, 2004), that stated perceived cost has a significant influence on mobile banking adoption.Therefore the finding implies that the cost consideration of mobile banking users in Ethiopia did not prevent them to use mobile banking services.

4.2.7 Relative advantage and mobile banking adoption

In relation with relative advantage on mobile banking adoption in Ethiopia, as it can be seen in the results section, this study found a positive and statistically significant relationship between the two and this finding was in line with pervious literatures (McCloskey, 2006; Rogers 2003 and Lin 2011) that stated relative advantage has a positive significant effect on mobile banking adoption.

This finding could imply that users in Ethiopia might gain more relative advantages on using mobile banking as compared to other traditional banking channels such as ATM or internet banking or visiting the bank.

To summarize, this chapter discussed the survey analysis results and then presented the discussions of these results using the appropriate method.

Accordingly, the chapter presents the results of the hypotheses of the independent variables tested on the dependent variable (MBA). Empirical results provide detailed discussions on sample descriptive statistics between MBA and independent variables (perceived usefulness, perceived ease of use, perceived credibility, perceived self-efficacy., perceived risk, perceived cost and relative advantage), followed by correlation analysis to determine the correlation between independent variables.

Logistic regression analysis was also used to describe the perceived determinants of mobile banking adoption.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

The purpose of this study is to assess perceived determinants of mobile banking adoption in Ethiopia among CBE customers.This chapter, based on the findings of the study, presents the, conclusions, recommendations and future research of the study.

5.1 Conclusion

This study was able to conceptualize how Perceived usefulness, perceived ease of use, perceived credibility, perceived Self-efficacy, perceived Risk, perceived cost and Relative Advantage affect mobile banking adoption. In this study a five (5) Likert Scale was used to measure all of the variables.Conclusions drawn on the determinant factors influencing consumers' adoption of mobile banking are:

- **Perceived usefulness** was found to have a positive significant influence on mobile banking adoption which indicates that the sample is aware of the importance of perceived usefulness.
- **The perception of ease of use**was also found to have a positive significant influence on mobile banking adoption.
- **Perceived credibility or Compatibility** has emerged in this study statistically insignificant influence on customers' adoption of mobile banking adoption. Therefore, it can be concluded thatusers find mobilebanking more compatible with their existing values, life styles and past experiences.
- **Perceived Self-Efficacy** found to have a positive significant influence on mobile banking adoption. This implies that users' knowledge, ability and skills are needed to use the new information technology.
- **Perceived Risk** was found to have a negative significant influence on mobile banking adoption This implies that users perceived higher risks in leaking their personal information during message passing or loss of their money if they lose their mobile phone therefore it can be concluded that perceived risk would hinders the adoption of mobile banking .

- **The perception of cost** has emerged in this study as negatively but insignificant influence on customers' adoption of mobile banking. Therefore the study implies that the cost consideration of mobile banking users of CBE did not prevent them to use mobile banking services.
- **Relative advantage** was also found to have a positivesignificant effect on customer's adoption of mobile banking. The study implies that users perceive mobile banking has a significant relative advantage over branch banking in accessing accounts from any location and at any time, and provides greater control and flexibility in managing their accounts.

5.2 Recommendations

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

- ✓ Banking sectors 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
- ✓ In the lists of mobile banking services that are provided by CBE, the option "Transfer to any non CBE customer "was not applicable to access therefore the bank should give prior attention to the options before launching the services.
- ✓ Easy to use mobile banking is important for all customers so, banks should aim to make their mobile banking as simple and easy to use as possible so that customers do not perceive them as being complicated or difficult to use. This gives insights for user interface developers to design user friendly system.
- ✓ Since potential adopters want to know the degree to which a new idea is better than an existing practice, the bank should emphasize in designing different banking features of the service considering customers' lifestyle, culture and language.
- ✓ In order to increase the adoption rate banks should focus on mobile banking non-users
- ✓ It is important for the bank to project higher security when providing mobile banking services and let its customers know how the security issue is reveled in order to yield higher customers' acceptance.

5.3 Future Research

This study may not have exhausted all the factors that affect mobile banking adoption It is therefore recommended that further research should be done to unveil the other factors. Further research could also be done to evaluate how mobile banking contributes to paperless banking, whether it has any impact on internet banking and how it can be integrated or interlinked with internet banking, considering the current vision for banks is to go paperless and branchless. This will help banks to determine whether they are heading in the right direction in adopting technological innovation to achieve their goals and visions of branchless banking.

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APPENDIX I

QUESTIONNAIRE

Dear Participants

The title of this thesis is "Perceived determinants of mobile banking adoption in Ethiopia: A case of Commercial bank of Ethiopia"

The aim of this project is to assess the main perceived determinant of mobile banking adoption in Ethiopia. This questionnaire is prepared to supplement the data obtained from other sources.

This survey questionnaire is being distributed to get relevant information from randomly selected mobile banking users and participation is totally voluntary. The investigator respectfully requests your kind cooperation in answering the whole question as frankly as possible and your response will be recorded anonymously and strict confidentiality will be maintained.

GENERAL INSTRUCTION

This questionnaire contains three sections and 6 pages that will be expected to take approximately 15 to 20 minutes to complete. Please provide your responses to the questions based on the instructions under each section.

SECTION I: DEMOGRAPHIC PROFILE OF RESPONDENTS

Please indicate the following by ticking (√) on the spaces in front of the response options:

1. Gender

1.(Male)	
2.(Female)	

2. Age

(18-25)	26-35	36-45	46-55	55+

3. Highest Educational level achieved

(1)High school Completed	
2.Diploma Completed	
3.Degree Completed	
4.Masters and above	
5.Other, please specify	

4. Occupational status

(1)Student	
(2)Employed	
(3)Self Employed	
(4)unemployed	
(5)Others please specify	

5. Monthly income in Ethiopian Birr (ETB):

(1) 0-1650	
(2) 1651-3200	
(3) 3201-5250	

(4) 5251-7800	
(5) 7801-10900	
(6) >10900	

6. How long you have been using mobile banking?

(1) Less than 1 year	
(2) Greater than 1 year	

7. With whom you are influenced to register?

(1)Advertisement	
(2)Family/Friends	
(3)Bank's Policy	
(4)Others/please specify	

SECTION II: MOBILE BANKING SERVICES

1. On a scale of 1 to 5 please state how often you use the following services on average in a month, by ticking the appropriate box, where 1- Never, 2 - Rarely, 3 – Sometimes, 4 - Often, 5 – Always

		(1) Never	(2) Rarely	(3) sometimes	(4) Often	(5) Always
A	Balance Inquiry					

B	Own Account Transfer (Transfer between your accounts)					
C	Make a payment to beneficiary(Transfer to your beneficiaries)					
D	Payment to others(Transfer to any CBE account)					
E	Local Money Transfer (Transfer to any non CBE customer)					

SECTION III: FACTORS AFFECTING MOBILE BANKING ADOPTION.

Please indicate the extent to which you agree or disagree with each of the following statements by ticking **"√"** from 1 to 5 that best represents your level of agreement with the statement.

Note: 1- Strongly Disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly Agree

The following are some factors affecting when adopting Mobile banking system, please indicate level of your choice.		(1) Strongly Disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly Agree
Perceived usefulness						
1	I find Mobile banking useful for my banking needs					
2	It Reduces number of customers come to the banking hall					
3	No time limit to access bank account and					

	information					
Perceived ease of use						
4	Learning to use mobile banking is easy for me.					
5	Our bank provide guidelines on the use of mobile banking facility					
6	Mobile banking requires a simple registration process.					
7	Using mobile banking makes it easier for me to conduct my own banking transactions					
Perceived Credibility /Compatibility						
8	Using mobile banking fits well with the Way I like to control and manage my banking transactions.					
9	I use mobile banking because I am doing everything with my cell phone					
10	I am satisfied with current mobile banking service this stage because it is already a part of my daily life.					
11	I know that my banking details are safe if my phone is stolen					
Perceived Self-Efficacy						
12	I do not need anyone to teach me how to use mobile banking because I can learn it by					

	myself					
13	I use mobile banking because it has a built – in help facility for assistance					
14	I use mobile banking because I have seen someone else using it					
15	I use mobile banking because someone has shown me how to do it					
Perceived Risk						
16	I do not trust the technology provided by the banks					
17	Mobile banking is unreliable because I afraid that my personal or transaction detail would be leaked during message passing					
18	If I lose the mobile phone as a mobile banking user, in the meantime, I will lose my money as well.					
Perceived cost						
19	It costs a lot to use mobile banking					
20	Using mobile banking increases my banking costs					
21	There are financial barriers (Cost of mobile phone)					

Relative Advantage						
22	Mobile banking is more accessible than other banking services (i.e. Internet banking, visiting the bank ,ATM service)					
23	Mobile banking is more convenient than other banking options					
24	Mobile banking is time saving than other banking services(i.e. Internet banking, visiting the bank, ATM service)					

SECTION IV QUESTIONS RELATED TO MOBILE BANKING ADOPTION

Please answer the following by ticking the appropriate option:

25. Are you active mobile banking user?

1(Yes)	
2(No)	

26. Did your mobile phone support mobile banking at the time you signed up the service? If yes please proceed to question 28. If no please proceed to question 27.

1(Yes)	
2(No)	

27. Did you have to purchase a phone that supports the service?

1(Yes)	

2(No)	

28. Does your income influence your use of mobile banking?

1(Yes)	
2(No)	

29. Are there any security concerns that have been raised concerning your bank‘s mobile banking services

1(Yes)	
2(No)	

30. Do you find your bank‘s advertisements on mobile banking appealing or interesting enough to encourage customers to sign up?

1(Yes)	
2(No)	

31. Does your attitude towards change (how you perceive change) affect your use or uptake of mobile banking?

1(Yes)	
2(No)	

Thank you for your co-operation