DETERMINANTS OF THE USE OF MOBILE BANKING SERVICES: THE CASE OF SOUTH ADDIS ABABA DISTRICT, COMMERCIAL BANK OF ETHIOPIA

BY

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Declaration

I, Worku Simachew**,** declare that the study entitled "**DETERMINANTS OF THE USE OF MOBILE BANKING SERVICES: THE CASE OF SOUTH ADDISABABA DISTRICT, COMMERCIAL BANK OF ETHIOPIA"** is the result of my own effort in research undertaking. All information in this document has been obtained and presented in accordance with academic rules and ethical conduct. The study has not been submitted to the award of any Degree or Diploma in any college or university both in Ethiopia and abroad. Lastly I have fully acknowledged all the material that is not original to this work.

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Worku Simachew

LETTER OF CERTIFICATION

This is to certify that Worku Simachew has carried out his research project work under my supervision, on the topic of "**DETERMINANTS OF THE USE OF MOBILE BANKING SERVICES: THE CASE OF SOUTH ADDIS ABABA DISTRICT COMMERCIAL BANK OF ETHIOPIA".** This work is original in its nature and it is suitable for Submission in partial fulfillment of the requirement for the award of Degree of masters of Arts in development Economics.

Dr.Maru Shete (Assoc.Prof.)   _____

(Advisor)   Signature

                                                                _____

                                                                 Date

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APPROVED BY BOARD OF EXAMINERS

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Internal Examiner   **Signature**

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First and foremost, Let the greatest thanks goes to the almighty GOD who made me arrive at this level!!

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God bless you all!!!

Table of content

Content   **Page**

List of table

List of Abbreviations and Acronyms

AMOS=Analysis of moment structure

ANOVA=Analysis of variance

ATM = Automatic Teller Machine

CBE = Commercial Bank of Ethiopia

EOT=experience on technology

FPD=fear of personal data

IDT=Innovation diffusion theory

ITU = International Telecommunications Union

M-Banking = Mobile Banking

MMA = Mobile Marketing Association

MNO = Mobile Network Operator

NBE = National Bank of Ethiopia

OCC=occupation

PCO=perceived costly

PEU = Perceived Ease of Use

PR = Perceived Risk

PS=perceived security

PU = Perceived Usefulness

SIM = Subscriber Identity Module

SQ=service quality

TAM = Technology Acceptance Model

TPB = Theory of planned behavior

TRA = Theory of Reasoned Action

USSD = Unstructured Supplementary Service Data

UTAUT =Unified Theory of Acceptance and Use of Technology

VTU=Voluntary to use

WAP = Wireless Application Protocol

Abstract

Commercial banks in Ethiopia introduced mobile banking technology. However, the numbers of users of the services are very small, even by African standard. This research paper aims to identify the factors that affect the adoption of mobile banking technology in the South Addis Ababa district of Commercial bank of Ethiopia. Data were generated from 362 customers of the bank who were selected based on stratified and convenient sampling method. Data were analyzed using the binary logistic regression model. Besides, descriptive statistics such as frequency, percentage, mean, and standard deviation. The study found out that sex, income, perceived security of the technology, perceived usefulness of the service, experience on technology and voluntarism to use have positive and significant effect on the use of mobile banking service. Therefore, to increase the penetration and growth of mobile banking service, Commercial bank of Ethiopia should work on the correlates that affect the adoption of the service.

Keywords: Mobile banking service, adoption, determinants, binary logit, Commercial bank of Ethiopia.

Chapter One
Introduction

1.1 Background of the study

Worldwide the way in which banks deliver services has undergone a paradigm shift with the banks increasingly going towards the provision of electronic services in the self service mode. Tough competition and increasing customer expectations have forced all major commercial banks, irrespective of the sectors, to adopt the provision of banking services through ATMs, internet banking, mobile banking etc. The services through these channels offer tremendous advantage both to the banks and their customers. For the banks, the advantages are reduced transaction costs and lesser crowding in their branches. For the customers, these channels offer the convenience of doing bank transactions from the places of their choice, even homes and conducting them any time of the day they want (Koshy, 2009).

The increase in competition and change, co-operation, globalization and convergence, as well as changing consumer preferences means that new strategies to attract and maintain customers are essential. The Internet is therefore being considered as a strategic weapon and will revolutionize the way businesses operate to seize opportunities and overcome threats. The banking sector is no exception, the Internet is causing major delivery changes and is bringing about a transformation of this sector this is because the financial sector is one of the most affected by technology banking has always been a highly information intensive activity that relies heavily on technology to acquire, process, and deliver the information to all relevant users. Increasingly competition in the financial services sector is forcing providers to develop and utilize alternative delivery channels IT and Internet technology is therefore a revolutionary approach for banks to provide convenient, reliable and expedient services to bank customers (Tan & Teo, 2000 cited in Jaruwachirathanakul, 2003).

In banking, in the past, the technology strategy was considered as subordinate to business strategy. But now with so much advancement in technology it has become as important as business strategy.

Technology has provided an altogether new way of interacting and providing service to bank customers rather than merely replicating activities of the bank employees (Koshy, 2009).

The banking industry has witnessed significant advancement in technology just like any other sector. The adoption of e-banking service is one of the advancement that affects banking operations entirely. With the adoption of self-service technology by the banks, e-banking system has continued to service the populace well. Electronic banking offers convenience to costumers and it provides banking services well beyond the traditional service period. It therefore encourages a cashless society and every sector of the economy whether financial or nonfinancial organization is adopting computer based approaches to the service rendered. Mobile banking which is a type of electronic banking is becoming more popular in modern banking and as such has been a subject of interest among researchers. Mobile banking means a financial transaction conducted by logging on to a bank's data base using a cell-phone; such as viewing account balances, making transfer between accounts, or paying bills. It is a term used for performing balance checks, account transactions, payments etc, via a mobile device such as a mobile phone. In recent times e-banking is most often performed via SMS or the mobile interest and can also use special program called client downloaded to the mobile (Oluma et.al, 2016).

Electronic banking technologies have contributed to improving of effectiveness of banks' distribution channels through reducing the transaction cost and increasing the speed of service, mass customization, marketing and communication activities, and maintaining the customers and attracting new ones, From the customer's perspective, e-banking allow customers to save time and cost. Due to the advantages of e-banking for both banks and customers, the adoption of electronic banking recently has rapidly grown as a channel of distribution of banking products and services (Bucevska, 2011).

The concept of mobile-banking is generally used to refer to the new technologies that enable access to banking services via mobile phones. mobile-banking, also referred to as cell phone banking, is the use of mobile terminals such as cell phones and personal digital assistants (PDAs) to access banking networks via the wireless application protocol (Francois et.al

2

2015). Mobile banking involves mini-statements and checking of account history, alerts on account activity or passing of set thresholds; monitoring of term deposits, access to card statements, mutual funds/equity statements; insurance policy management, pension plan management, access to loan statements; status on cheque, stop payment on cheque, ordering check books, balance checking in the account, PIN provision, change of PIN and reminder over the internet, domestic and international fund transfers, recent transactions, due date of payment, micro-payment handling, mobile recharging, commercial payment processing, bill payment processing, peer to peer payments and deposit at banking agent (Cudjoe et.al, 2015).

In Ethiopia, the first bank that deployed mobile banking service is the state-owned Commercial bank of Ethiopia. However, online banking is in its infant stage. Even though, the concept of online banking implemented in Ethiopia with a single service of SMS message during late 2008, it does not show that much improvement as its age. Now a day some banks are adopting e-banking system which is the state of the art. In addition, many banks are making what seem like huge investments in technology to maintain and upgrade their infrastructure, in order not only to provide new electronic information based services, but also to manage their risk positions and pricing. The earliest forms of electronic and communications technologies used mainly in Ethiopian banking offices were automation devices. However, Telephones, telex and facsimile were employed to speed up and make more efficient the process of servicing clients (Mattewos, 2016). Banking institution cannot increase their customer base in the mobile banking environment without knowing what factors enable or inhabit consumers from adopting such service. As there are ever increasing pressures on telecommunications operators and banking institutions to increase their revenue, it is important to understand what drives consumer adoption of mobile banking services but failure to do so could result in a loss of market share and limited growth in the mobile banking sector for both financial and network operators.

1.2 Statement of the problem

Commercial bank of Ethiopia have spent huge amounts in establishing mobile banking systems, but the adoption and usage rate of mobile banking is still lower than expected and remains insignificant compared to the entire banking transactions. For instance the bank has

only managed to recruit 625,000 new mobile banking in 2015/16 physical year but the actual new mobile banking activated was 431,677 customers (72% activations below the planned 80% activation) and total mobile banking registered stood at 1.1 million out of over 13.3 million accounts –holders as of December 30, 2016. This amounts account to only 8% of all commercial bank of Ethiopia customers. Furthermore, in the same period, mobile banking transaction stood at 868,464 with a total value of birr 3.5billon (CBE, 2016/2017).

The bank had hoped that it would be able to capture most, if not all of these mobile phone subscribers into its M-Banking platform which is available to both account and non-account holders. It is true that mobile banking is an infant stage since its introduction in 2013 for the Ethiopian society. It is therefore important for the banking industry to understand the factors that affect the technology adoption decision of mobile banking users.

Previous studies in various countries identified the factors that determine the adoption of mobile banking services. For example, studies by Alsheikh and Jamil (2014) in Saudi Arabia, Yu (2012) in Taiwan, Oliver (2012), Ndumba et.al (2014) and Abdullatif (2015) in Kenya, Fall et.al (2015) in Senegal, and Cudjoe et.al (2015) in Ghana have shown that the apathy of the bank consumers towards mobile banking services affected the adoption negatively, while customers belonging to the well educated, young, relatively well-off and residing mainly in urban areas, etc adopted the technology. Studies conducted about the determinants of adoption of mobile banking services in Ethiopian commercial banks by Mattewos (2016) and Laekemaryam (2016) found out that perceived usefulness and perceived ease of use of the technology to have positive relationship with the adoption of mobile banking whereas perceived risk has negative relationship with the adoption of mobile banking. In these studies important variables such as experience with technology and voluntarism to use the service were omitted while they are important. In the current study, the researcher included these omitted variables and estimated the determinants of adoption of mobile banking services using the binary logit model while in the previous studies data were analyzed using the Analysis of Moment Structure. Therefore, this study is an effort to fill in the existing knowledge gap due to omission of relevant variables in the analysis.

1.3 Objectives and research questions of the study

1.3.1. General and specific objective of the study

The general objective of the study is to identify the determinant of mobile banking usage in commercial bank of Ethiopia. The specific objectives of the study include:

1. To examine the effect of demographic factors on the adoption of mobile banking technology by bank customers.

2. To examine the effect of customers experience on technology and voluntarism to use on the adoption of mobile banking in commercial bank of Ethiopia.

3. To examine the influence of user's perceived risk on the adoption of mobile banking.

1.3.2 Research questions of the study

The study aims at addressing the following research questions:

1. Are there any differences in mobile banking usage based on consumer income level?
2. Are there any differences in mobile banking usage based on consumer's gender?
3. Are there any differences in mobile banking usage based on customer's age difference?
4. Are there any differences in mobile banking usage based on consumer's education level?
5. Are there any differences in mobile banking usage based on customers experience on technology?
6. Are there any differences in mobile banking usage based on customer's occupation category?

1.4. Research Hypothesis

Based on the literature, the study proposed the following hypothesis about the possible relationship between adoption of mobile banking services and its determinants.

Table .1.1 Variables and their expected signs

Variables	Expected sign	Measurement
Sex	Positive	1,if male 0, if female
Age	Positive	Year
Income	Positive	Birr
Year of schooling	Positive	Year
Fear of misuse of data	Negative	1 if respondent is afraid that his/her personal data will be misused; 0 otherwise
Perceived security	Positive	1 if respondent perceives commercial Bank's as secure, 0 otherwise
Perceived ease to use	Positive	1 if respondents perceive mobile banking is easy to use, 0 otherwise.
Perceived usefulness	Positive	1 if respondents perceive mobile banking is useful, 0 otherwise.
Occupation	Positive	1 if the respondents are employed, 0 otherwise
Experience on technology	Positive	1 if the respondents are experience on technology, 0 otherwise
Service quality	Positive	1 if respondents perceived the service meets acceptable quality, 0 other wise
Perceived cost	Negative	1 if respondents perceived the service is costly, 0 other wise
Voluntarism to use	Positive	1 if respondents are voluntary to use the service, 0 other wise

1.5. Significance of the Study

This study is deal with determinant of mobile banking adoption in commercial bank of Ethiopia in case of South Addis Ababa district and will contribute to the adoption literature in the area of mobile banking. More specifically, the finding from this research can be used by banks to improve their service and enhance the adoption of the mobile banking services .Therefore, the result of this study will contribute to the banking industry by suggesting them

to improve the practice of service delivery by the bank and will inform policymakers by pinpointing to them the importance of factors related to risk of technology adoption.

1.6. Scope and limitation of the study

Undertaking research on the determinants of mobile banking usage in commercial bank of Ethiopia at national level is a complex task since it requires huge finance, and time,. The geographic scope of this thesis is therefore limited to the study of the determinants of adoption of mobile banking services in commercial bank of Ethiopia at southern district level. While the factors that determine adoption of mobile banking services presented in the literature are several, this study examines only some factors or determinant of mobile banking adoption. The study is conducted to identify the determinants of the adoption/use of mobile banking services in the case of south Addis Ababa district of the Commercial bank of Ethiopia. While the branches were selected by using stratified sampling technique, the sample respondents were selected using convenience sampling method due to the difficulty of accessing sample customers. These may limit the representative of the research results.

1.7. Organization of the study

The study is organized in to five chapters. Chapter one is about introduction part which includes background of the study, statement of the problem, objective of the study, significant of the study, hypothesis and scope and limitation of the study. Chapter two present theoretical and empirical literature review that related with the topic. Chapter three comprises the methodology and source of data used in the study. Chapter four consist data analysis and interpretation of the results. Finally, chapter five presents the conclusions and policy implication of the study.

Chapter two

Literature Review

2.1 Theoretical literature review

The innovation of technology faced many reactions by the people, some people perceive that it makes the task easier and time saving while on the other hand some people perceive it according to the perspective of risk and fear (Azam et al., 2014). Now a day's technology like E-Banking makes the task easier. The day's work an individual can complete within hours due to advent of technology. Many institutions adopt the technology so that they can easily access to their customers. Banking sector more focused upon E-Banking because it helps them to get more competitive advantage by providing better service quality E-Banking service was started from developed countries and it was originated with Automated Teller Machine (ATM) since 1980. But in 1990 the banking sector started to perform their banking transaction through telephone. But in 1995 internet banking service was introduced in USA, E-Banking is the abbreviation of Electronic Banking; it is defined as all the transaction can take place through electric system like web. E-Banking is the way that generates connection between the service provider and the customers. E-Banking helps all customers to make the transactions, to access their account or to get the information through the internet. Banking sector usually use the approach of E-banking for competition. Due to the introduction of technology many banking sector use this technology for the purpose of information source as well as transaction, as the results E-Banking users can perform many banking transaction like balance inquiry, paying of bill, checks writing transfer of funds from one account to another. E-Banking provides facility to their customers and to fulfill customer's expectation about this service. The great risk is involved in this advance technology E-Banking. As there is numbers of hackers who also use this facility and can hack customer's personal information. This thing can reduce people trust and their using behavior of E-Banking (Azam et al., 2014).

Financial services industry over time has opened to historic transformation that can be termed as electronic developments which is advancing rapidly in all areas of financial intermediation and financial markets such as e-finance, e-money, electronic banking (e-

banking), e-brokering, e-insurance, e-exchanges, and even e-supervision. The new information technology (IT) is turning into the most important factor in the future development of banking, influencing banks' marketing and business strategies. In recent years, the adoption of e-banking began to occur quite extensively as a channel of distribution for financial services due to rapid advances in IT and intensive competitive banking markets. The driving forces behind the rapid transformation of banks are influential changes in the economic environment include among others innovations in information technology, innovations in financial products, liberalization and consolidation of financial markets, deregulation of financial inter-mediation. These factors make it complicated to design a bank's strategy, which process is threatened by unforeseen developments and changes in the economic environment and therefore, strategies must be flexible to adjust to these changes. The e-banking is transforming the banking and financial industry in terms of the nature of core products /services and the way these are packaged, proposed, delivered and consumed. It is an invaluable and powerful tool driving development, supporting growth, promoting innovation and enhancing competitiveness. Banks and other businesses alike are turning to IT to improve business efficiency, service quality and attract new customers. Technological innovations have been identified to contribute to the distribution channels of banks and these electronic delivery channels are collectively referred to as electronic banking (Elisha, 2010).

The evolution of banking technology has been driven by changes in distribution channels as evidenced by automated teller machine (ATM), Phone- banking, Tele-banking, PC-banking and most recently internet banking. E-banking is the term used for new age banking system. E-banking is also called online banking and it is an outgrowth of PC banking. E-banking uses the internet as the delivery channel by which to conduct banking activity, for example, transferring funds, paying bills, viewing checking and savings account balances, paying mortgages and purchasing financial instruments and certificates of deposits .It is difficult to infer whether the internet tool has been applied for convenience of bankers or for the customers' convenience. But ultimately it contributes in increasing the efficiency of the banking operation as well providing more convenience to customers. Without even interacting with the bankers, customers transact from one corner of the country to another corner (Elisha, 2010).

E-banking is a term which is explained as customer enjoyment of banking services electronically, without the having physical appearance to the bank's branch. It is also sometimes regarded with internet banking, home banking, virtual banking, online banking, remote electronic banking and personal computer banking. E-banking provides a wide range of financial services, namely, ATM services, fund transfer, utility bill payment and online payments. Generally, E-banking is a remote facility to perform banking services using the internet (Muhammad, 2015).

2.1.1 Mobile Web

Mobile web allows users to access web sites from their handsets and it is a channel for the delivery of web contents through the mobile handset. As result of the advancement in mobile handset devices in terms having web browsing feature as well as wider screen with high resolution coupled with availability of mobile internet services with higher quality (broadband) and affordable services relative to what was before, use of mobile web for various services is growing across the various segments of consumers. Among those services use of mobile web for mobile banking is becoming popular in the banking business. Like SMS channel mobile web has its own advantages and disadvantages some of which are described below.

Advantage

- ✓ User experience of browsing the internet from mobile device is familiar and offers a rich experience,
- ✓ Allows users to access corporate applications
- ✓ Secure connections can be established on most of the mobile browsers

Disadvantages
- ✓ Many nonstandard variables including handsets, browsers, and operating systems
- ✓ Inconsistent user experience due to varying connection speeds and handset limitations

✓ Users need to have data plan which may be a barrier to adoption among price sensitive demographics

✓ No off line (out of the coverage) capability

2.1.2 Mobile Client Applications

Mobile client applications are a rapidly developing segment of the global mobile market. Mobile client applications are common on most mobile phones today and are key to providing user interfaces for basic telephony and messaging services as well as for more advanced and entertaining experiences. It has evolved to give a user access to services that require richer, faster and not necessarily connected user experiences. In this respect mobile applications are distinctly different from browsing the mobile web. The combination of a client application on the handset and server component enables many benefits including access to all banking functionalities strong authentication and encryption of sensitive data and the ability for customization and branding. From the financial services and applications point of view, mobile client applications have variety of advantages and disadvantages. In terms of advantages, it offers organizations more control over the user experience with a rich user interface capability, enhance the ability to work even when there is no connection to the wireless network, provides secured access with applications, supports for access to corporate customs applications, and provides the ability to provide remote wipe-out of information when device is lost or stolen (CBE, 2016/17).

2.1.3 M- Banking Business Models

A wide spectrum of Mobile/branchless banking models is evolving. 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 banking agents, i.e. retail or postal outlets that process financial transactions on behalf telecoms or banks. The banking agent is an important part of the mobile banking business model since customer care, service quality, and cash management will depend on them. Many telecoms will work through their local airtime resellers. However, banks in Colombia, Brazil, Peru, and other markets use pharmacies, bakeries, etc. These models differ primarily on the question that who will establish the relationship (account opening, deposit taking, lending etc.) to the end customer, the Bank or the Non-Bank/ telecom Company (Worku, 2015).

1. Bank-focused Model

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 banks" customers. This model is additive in nature and may be seen as a modest extension of conventional branch-based banking.

2. Bank- Led Model

The bank-led model offers a distinct alternative to conventional branch-based banking in that customer conducts financial transactions at a whole range of retail agents (or through mobile phone) instead of at bank branches or through bank employees. 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 (telecom operators / chain store) having experience and target market distinct from traditional banks, and may be significantly cheaper than the bank-based alternatives. The bank-led model may be implemented by either using correspondent arrangements or by creating a JV between Bank and Telco/non-bank. In this model customer relationship rests with the banks non bank led model.

3. Non – Bank Led Model

The non-bank-led model is where a bank does not come into the picture (except possibly as a safe-keeper of surplus funds) and the non-bank (e.g. telecom operators) performs all the functions.

2.1.4 M-banking Technology Adoption models

Adoption: is defined as the act or process of beginning to use something new or different (M. Webster). Technology adoption is thus the process of beginning to use new technology or different technology by customers, organizations etc. As result of the dynamism of the information and communications technology innovative technological products are released. And the growth of nations, organizations and individuals is highly dependent on how best they adopt the technology in their operations. In order to understand how people can accept or adopt technology various models are developed and used.

In the following paragraphs some technology acceptance models are briefly discussed which include: (1) The Theory of Reasoned Action (TRA), (2) Theory of planned Behavior (TPB), (3) Innovations Diffusion Theory, and (4) Technology Acceptance Model (TAM).

Theory of Reasoned Action (TRA)

As a part of social psychology, TRA is one of the most fundamental and influential theories of human behavior. Theory of Reasoned Action is a psychological theory that tries to explain an individual's action that is determined by his/ her behavioral intention to perform it. Ajzen and Fishbein (1975). It has been used to predict a wide range of behaviors According to their theory, behavioral intention (use technology), is explained by people's attitudes toward that behavior and subjective norms. People's attitude toward a behavior includes behavioral beliefs; assess the consequences of behavior, subjective norms, normative beliefs and motivations that must be answered (Riivari, 2005; Puschel et al, 2010). This theory, as long as the behavior is voluntarily controlled by the individual, can accurately explain the factors influencing technology adoption (Laukkanen and Cruz, 2009). Thus, TRA is a useful model that will be used to investigate factors affecting adoption of mobile banking.

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) is proposed as an extension of the Theory of Reasoned Action (which was related to voluntary behavior), because of the limitations of TRA in dealing with behaviors over which people have incomplete Volitional/autonomous control. The TPB introduced a third independent determinant of intention, perceived behavior control (PBC). For this reason, TPB was introduced by Ajzen in 1985 (Ajzen 1985) The theory was called the theory of planned behavior (TPB) since it evolved from the Theory of Reasoned Action, with an additional construct (PBC). According to Ajzen (1991), TPB incorporates an additional construct in order to account for situations where an individual lacks the control or resources necessary for carrying out the targeted behavior freely. TPB is a theory that predicts deliberate behavior, because behavior can be deliberative and planned, and TPB is considered to be more general than TRA because of PBC (Chau & Hu 2002).

Technology adoption models

The adoption of a new technology takes a considerable amount of time. The economic literature have mainly focus in the inter and intra-firm adoption of generic technologies, such as ICT, in which empirical studies, as well as literature, indicate that a new technology is adopted slowly at first but at an increasing rate over time until a point of inflexion is reached, after which, the rate of growth declines. Several economic models have tried to explain how the diffusion of technology takes place and why firms adopt the technology at different stages These models roughly consist of the so-called "equilibrium" models (Battisti & Stoneman, 2003; David, 1991; Karshenas & Stoneman, 1993), the "epidemic" models (Mansfield, 1961, 1968) and the adoption models with "network externalities" (David, 1985; Farrell & Saloner, 1985; Katz & Shapiro, 1986)3. On the other hand, several models have focused on the demand side, or the consumer technology diffusion process (Battisti, 2008). This literature takes into consideration the spreading of consumer technology within and across households (Mahajan, Muller, & Bass, 1990; Zettelmeyer & Stoneman, 1993). However, as Battisti (2008) states consumers' choice could be modeled following either the epidemic or the equilibrium approach.

1) Equilibrium Models: The equilibrium models are based on at least two of the tenets of mainstream neoclassical theory: such as equilibrium, infinite rationality and full information (Battisti & Stoneman, 2003; David, 1991; Karshenas & Stoneman, 1993 cited in Fall 2014). This theory considers that the decision to adopt is the result of a cost-benefit calculation by potential adopters (firms or individuals) who anticipate the net benefits from adopting and using these technologies. These models are based on the hypothesis that information about the technology is known and shared and that the differences in the adoption levels between agents result from their heterogeneity. The most notorious of these models is the Probit approach, where the expected benefits from the technology will depend on the agent's "rank effects", "stock effects" (Karshenas & Stoneman, 1993; Reinganum, 1981) and "order effects" (Fudenberg & Tirole, 1985).4 Rank effects (David, 1991; Karshenas & Stoneman, 1993) suggest that firms/individuals differ in their own internal characteristics such as size, access to financial resources, governance structure, market power, etc. They also differ in their "absorption capacity" (Cohen & Levinthal, 1990), which includes both "learning" and

"switching" costs. The term "rank" is used because, in these models, the net benefits can be classified according to the type of firm. The firms positioned in the higher ranks will be the first to adopt the technology. Depending on these effects, some firms will generate higher net benefits than others from the adoption of the technologies. The assumption is made that these benefits from adoption are independent of the number of other users of the new technology. As Battisti (2008) pointed out, the difference between firms and households is that the factors affecting the adoption of the latter are changes in preferences, information, prices, income, product performance lending and borrowing decision, among others.

2) **Epidemic models:** The second group of technology adoption models is the "epidemic" models (Mansfield, 1961, 1968 Cited in Fall 2014).), which emphasize the influence of information spillover effects on the diffusion of technologies. The process of technological diffusion is considered similar to the spread of disease by infection. A greater number of adopters indicate a greater amount of information that is available about the technologies and a higher diffusion rate of the information. The basic hypothesis is that it takes time for information about a new technology to reach all potential users (Geroski, 2000). A potential user becomes a user through contact with an existing adopter; a greater number of adopters lead to a higher probability that a non-adopter will be in contact with an adopter and a higher probability that the non-adopter will be "contaminated". The assumption is that a new technology requires both the existence of a common source of information and a transmission process via "word of mouth". An implicit hypothesis underlying these epidemic models, which is also one of their major shortcomings, is that once individuals know of the technology, they will adopt it.

3) **Networks externalities:** An additional set of models has been developed in order to explain the diffusion of technologies. Technology adoption models with "network externalities" have been well studied in the literature, especially for the adoption of competing technologies (David, 1985; Farrell & Saloner, 1985; Katz & Shapiro, 1986 cited in Fall 2014). Technology is characterized by network externalities that occur when the benefit an agent obtains from his adhesion to a network is positively correlated to the number of members connected to this network. In these types of models, users are heterogeneous,

with different preferences for innovation and simultaneously decide whether to adopt or switch to a new technology or stick with their current own. In the same matter, it may be optimal for a firm to adopt a technology, simply because others have already done so, regardless of the information they have on the efficiency of such technology (Arthur, 1989). Katz and Shapiro (1986) suggest three possible sources of network externalities: i) the direct physical effect of the number of adopters on the quality of a particular technology. For instance, mobile phones are useful depending on the number of other users that have joined the mobile network; ii) there may be indirect effects such as the number of complementary goods available for a particular technology. By having a mobile subscription, then the user will have the access to a large range of services, such as m-banking, iii) the amount and quality of "post-purchase" services for the good (or technology) will depend on the size of the service network, and the number of units of the good that have been sold.

The Unified Theory of Acceptance and Use of Technology (UTAUT) Model

Venkatesh et al. (2003) proposed and tested a unified information technology acceptance and use research model, called the Unified Theory of Acceptance and Use of Technology (UTAUT). The model integrates significant elements across eight prominent user acceptance models and formulates a unique measure with core determinants of user behavioral intention and usage. In this model the original UTAUT aims to explain user intentions to use an IS and subsequent usage behavior. Furthermore UTAUT model suggests that there are a set of factors that influence the intention of the individual user acceptance (Mohammad, 2012). Venkatesh (2003), in their research article theorized that, four constructs play a significant role as direct determinants of user acceptance and usage behavior: (i) performance expectancy, (ii) effort expectancy, (iii) social influence, and (iv) facilitating conditions. Gender, age, experience, and voluntariness of use are also explained to mediate the impact of the four key constructs on usage intention and behavior (Venkatesh et al., 2003).

(i) Performance Expectancy (PE): Performance expectancy (PE) is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003). PE Is the strongest predictor of intention and remains

significant at all points of measurement in both voluntary and mandatory settings however from a theoretical point of view, there is reason to expect that the relationship between performance expectancy and intention will be moderated by gender and age. Perceived usefulness, relative advantage, outcome expectation, job fit, and extrinsic motivation are the constructs of performance expectancy (PE) from different models TAM, Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT), Model of PC Utilization (MPCU), and Motivational Model (MM) respectively. Researchers have demonstrated a positive relationship between performance expectancy and behavioral intention (Ibid, 2003). Hence, adapting performance expectancy to the context of mobile learning suggests that individuals will find mobile learning useful due to convenient access to information without the restriction on physical locations and time.

(ii) Effort Expectancy: The concept of Effort expectancy is developed from perceived ease of use, complexity, and ease of use from existing models which are TAM, MPCU, and IDT respectively. Effort expectancy found to be significant in the early time periods, but became insignificant over time (Venkatesh et al., 2003). As individuals became more familiar with the technology, the effort needed to use the technology declined. Previous research supported that the effort necessary to learn and use a new technology affected its acceptance and use (Gefen & Straud, 2000). In other word the easier a system is to use, the more likely it will be accepted and used (Sungwoo, 2009). To the extent that promoted effort expectancy leads to improved performance, previous studies indicated that effort expectancy had a direct effect on performance expectancy and intention to use mobile learning (Carlsson et al., 2006).

(iii) Social Influence: Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system. Social influence has an impact on individual behavior through three mechanisms: compliance, internalization, and identification (Venkatesh and Davis, 2000). Previous models showed that gender moderated this relationship as the effect was stronger for females than males (Sungwoo, 2009). However, current results showed that gender failed to moderate this relationship when testing the proposed model. Experience also was not a significant moderator of this

relationship, which fails to support the UTAUT findings in which non-users showed a stronger effect than users (Venkatesh et al., 2003).

(iv)Facilitating Conditions: Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003). This definition captures concepts embodied by three different constructs: perceived behavioral control from (TAM), facilitating conditions from (MPCU), and compatibility from (IDT).

Innovation diffusion theory (IDT)

Another theory pertaining to the adoption of new technology is the Innovation Diffusion Theory by Rogers (1983). According to Rogers (2003), there are five perceived characteristics of innovation that can be used to form a favorable or unfavorable attitude towards an innovation, namely: relative advantage, compatibility, complexity, trialability, and observability.

- Relative advantage: which refers to the degree to which an innovation is perceived as being better than the idea it supersedes is said to be a significant factor influencing positive or negative attitude towards an innovation.
- Compatibility: the extent of an innovation appearing as constant with previous instances of possible adopters, existing needs and values.
- Complexity: the extent of innovation being perceived as complex to utilize.
- Observability: the extent in which the result of an innovation concept can be observed by others.
- Trialability: the extent to which an innovation may be tried and tested with before

2.1.5 The Main Players of Mobile Banking

In order to analyze mobile banking we have to define the different players who participate in mobile banking. These players' actions and practice are important in developing mobile banking industry. Mobile banking is a collective participation of four parties that is:

1. Banking sector represented by operating banking institutions: The banking sector is composed of various financial institutions like Commercial bank of Ethiopia, Dashen bank,

United bank and other banks operating in the Ethiopian economy. These banks provide a network for accessing mobile banking services. The banking institutions have realized that there is need to increase financial inclusion by providing a network that helps the unbanked people to access financial services even without bank accounts.

2. Mobile network providers operating in the country: Network providers are the diverse companies that provide mobile banking services which include banks and telecommunication companies. An example of a Mobile Network provider is Ethiopian Telecommunication Corporation the Ethiopian people to send and receive money with or without an account or mobile phone. These network providers charge a fee for using their financial services and hence, the reason for being in business.

3. Beneficiaries, businesses and private consumers: Beneficiaries of the mobile banking services are the local Ethiopian citizens or other people in Ethiopia using the mobile banking services and business people who intend to make their payments using mobile money. Businesses and private consumers always use mobile money services to send or receive money from different kinds of people who are either family members or business partners. Mobile banking improves these players' standards of living.

4. Regulating authorities (Country's Central bank): The regulating authority is the Central Bank of Ethiopia which is the country's top most authority in banking matters. Central Bank of Ethiopia regulates fiscal and monetary activities that take place in the country. To operate in the country, the financial service providers have to follow all the regulations and terms set by the regulatory authorities.

The most vital factors are considered to make M-Banking successful are policy and regulations. Any profit making business usually takes into account the performance of all parties involved in the line of business (Abdulatif, 2015).

2.1.6 Information technology and the Global Market

The globe has more or less become a village; this is as a result of the internet and in fact the World Wide Web (www) whose impact has been felt by all sectors as well as all aspects of

human endeavors. The ripple effect of globalization an offshoot of the internet and World Wide Web has breathed a new life into the way individuals and businesses communicate .It has also amalgamated various cultures as well as brought high level but stiff economic competition among various players in the global business arena. The banks and other financial institutions has leveraged the explosive powers of this super-high way and most banks now use it as the main vehicle of marketing, selling as well purchasing. The era of brick-and-mortar and high costs attached to its establishment are now gradually giving way to simple and lower cost form of business transactions simply over the internet and the worldwide-web mostly in the developed countries, and now creeping into the developing countries (Edwin, 2015).

2.1.7. Technologies Employed to Provide Mobile Banking Services

Mobile banking services could be used through more than one channel such as short messaging service/messaging and application download (client-based) (Cudjoe et.al, 2015).

1. SMS-Short Messaging Service

This is where the customers communicate with the bank through their mobile devices by sending an SMS (short messaging service) to the bank. The short messaging service (SMS) works in two ways, and it can be either a pull mode or a push mode. In the push mode, the mobile customer send a text message to the bank which contains a service command with a predefined request code to the bank's specific number. The bank also reply with SMS containing the specific information requested from the bank while the pull mode is when the banks sends a text message to the subscriber (customer) to inform the customer about certain transaction that have just taken place over the account. The message could be in the form of an MMS (multimedia message service) or SMS (short message service) they both work similarly even though the use of SMS is more popular.

2) Client-Based

This method requires the customers to use software installation, and this will serve as a user interface that can allow customers to use the mobile device while offline to access some basic transactions before going online. Typing details before connecting to the internet could reduce cost. This client based application is particularly useful because it allows customers to

stay offline and while preparing transaction such as entry of account details and afterwards the transmission is made by sending out the data, this banking process conducted offline reduces online connection time and cost.

3) Browser-Based

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

2.1.8 Overview of factors influencing mobile banking

User adoption of mobile commerce applications has been determined by many factors such as:

1) Risk and security: security and trustworthiness of a service was identified as one of the most important factors within every target customer segment when deciding on the use of a banking service delivery channel. Using mobile phone in banking is trustworthy. Fain and Roberts (1997) defined "risk is a perception of consumer, not a characteristics of a product". It was found that the security factor could influence consumers' attitudes towards online banking .Furthermore, it was considered to be one of the greatest concerns in adoption of mobile banking services, as individuals may worry about security issues during mobile banking service transactions such as data input and output mechanisms loss of connection risk and personal performance mistakes. As a result, many people may decide not to use this service and ignore the extra benefits of using mobile banking (Yu, 2009).

2) Service characteristics: The account balance service is one of the most promising mobile banking services, and is designed to help customers check their account balance and latest transactions immediately anytime/anywhere. Location free access created convenience in requesting account balances. Furthermore, accessibility and portability are classified as dimensions of convenience in the consumer behavior. Consequently the spatial and temporal distance between need recognition and need satisfaction can be considered important for doing banking via mobile phone. The ability to allow consumers to have more control over

their financial situation is one attraction of mobile banking services, as the consumer prefers to act for himself/herself when dealing with his /her own monetary transactions through the mobile device. The flexibility of being able to use the service wherever and whenever the users want enables immediate completion of banking tasks (transferring money or paying a bill). This would save time and be perceived as convenient and efficient. The bank provides several services through mobile media, information based, transaction–based and personal services. The SMS service is the easiest way to check account balances and latest transactions via mobile phone. Speed of data transmission and the user interface impaired the added value of mobile services. Therefore, the characteristics of the service as perceived by the user and provided by the banking intuition and service provider are important factors influencing the usage of mobile banking (Yu, 2009).

3) Trust: In business studies, trust has been found to be important for building and maintaining long-term relationships .Electronic exchanges are believed to present numerous risks to customers while trust appears to be especially important for creating loyalty when the perceived level of risk is high. This has been identified as key to customer loyalty especially in the area of e-commerce, because it is crucial wherever risk, uncertainty and interdependence exist. The banking sector is strongly associated with high levels of trust related to security and privacy issues in the physical environment. Therefore, trust is an important consideration in the development and fostering of e-commerce relations in the context of knowledge-based economy. Lowering perceived risks associated with online transactions as well as maintaining transaction trust is vital keys to attracting and retaining customers (Benjamin, 2015).

4) Service Quality: Service quality refers to reliability, content quality, personalization. Daft and Lengel (1986) suggested that accuracy, reliability, and quality of information exchanged across a medium were critical to the effectiveness. In the context of mobile, the content refers to information, features, or functions that are offered via mobile banking services. Such content should be constructed logically to help user find information and incorporate features such as accuracy, timeliness, relevance, and flexible presentation (Huizingh, 2000). A reliable mobile system should ensure the effectiveness of mobile banking.

5) Perceived cost: The degree to which an individual views that utilizing mobile banking will incur cost s defend as perceive cost (Luarb & Lin 2005). These costs could typically include the cost of the mobile device, network charges, and transaction charges for bank costs as well as costs for data sent via the network infrastructure. The factor that had the least impact on mobile banking adoption in comparison to the other variables which includes perceived usefulness, perceived risk and compatibility, was perceived cost (wu and wang, 2005).

6) Behevioral intention

Consistent to all models drawing from psychological theories, which argue that individual behavior is predictable and influenced by individual intention, UTAUT contended and proved behavioral intention to have significant influence on technology usage [Venkatesh et al. 2003]. Given that the ultimate goal of businesses (i.e. commercial banks) is to attract consumers to adopt their services.

2.2 Empirical review

Building on the above literature review, empirical mobile banking and related studies were summarized below. The original UTAUT model proposed by Venkatesh et al. uses four moderators as determinants of intention and behavior with four core determinants, the moderators are sex, age, experience, and voluntariness of use.

A. Sex

Previous research showed that sex differences have shown to exist in technology acceptance (Venkatesh & Davis, 2000; Wolin & Korganmkar, 2003; Gefen & Straudb, 1997). Wolin and Korganmkar (2003) found that males and females differ significantly in several dimensions with 28 males exhibiting more positive beliefs and attitudes about E-commerce than females. In the UTAUT model, Venketash et al. (2003) proposed that gender would moderate the relationship between performance expectancy, effort expectancy, and social influence on intention to utilize the technology males exhibiting more positive beliefs and attitudes about E-commerce than females. They suggested that such differences stem from gender roles and socialization processes. Effort expectancy on intention was also moderated by gender.

Previous studies have found a stronger proportion of perceived usefulness of mobile services among men than among women (Nysveen et al. 2005).

B. Age

Numerous studies have discussed the effects of demographics on new technology adoption. However, compared to traditional innovation diffusion studies (Rogers 2003) that reveal earlier adopters of technological innovations as typically younger in age, having higher incomes, better educated, and having higher social status and occupation, research findings in the context of electronic banking are not consistent. Similar to gender, age is theorized to play a moderating role in the UTAUT model. In looking at gender and age effects, it is interesting to note that gender differences can be misleading without reference to age, Levy (1988). Venketash et al. (2003) proposed that the influence of performance expectancy will be moderated by both gender and age. Furthermore Age is confirmed as integral features of UTAUT.

C. Experience

Several studies showed that prior similar experience, such as computer or internet use, strongly influence intention to use and usage behavior of a specific system (Venkatesh et al, 2003; Wu et al., 2007). Venkatehs et al. (2003) suggested that an increase in experience would decrease the influence of effort expectancy and social influence on behavior intention to use. Kim and Malhotra (2005) confirmed that when user experience increase, effort expectance and social influence decrease. People who have more experience 29 using similar system are more relying on instrumental basis rather than social basis because experience users of mobile devices or wireless internet are more skillful and easy to use M-commerce (Wang and Yang, 2005).

D. Voluntariness of use

Voluntariness is the level to which an individual can choose to use a system; image is the extent to which individuals believe the use of a system will increase their social status within a group or how well others perceive them (Venkatesh and Davis, 2000). Yu (2012) on his study factors affecting to adopt mobile banking empirical evidence from the UTAT model, found that social influence, perceived financial cost, performance expectancy, and perceived

credibility, significantly affect intentions toward mobile banking. The model employed for the study was Unified Theory of Acceptance and Use of Technology (UTAUT), distributing 441 respondents. This study discovered that gender significantly moderated the effects of performance expectancy and perceived financial cost on behavioral intention, and the age considerably moderated the effects of facilitating conditions and perceived self-efficacy on actual adoption behavior. On the same study, the determinants of the adoption and use of m-banking in Senegal. It was based on technology diffusion theories, particularly applied to households, existing within a general framework of technology leapfrogging by developing countries. They distinguish between the possessions (partial adoption) from the actual use (total adoption) of m-banking. The study was based on a sample of 1052 households in the suburbs of Dakar. The main results are that the two decisions (adoption and use) are not independent from each other. Household's characteristics such as education and possession of a bank account are determinants of the adoption while age, gender and being a member of a tontine are determinants of the use. In addition, the main sources of information leading to the adoption of M-banking are formal such as promotions from mobile operators and informal such as friends and family networks. The study examined by Cudjoe et.al (2015) on the determinant of mobile banking adoption among bank customers in Ghana applied theoretical frameworks which have been developed from existing literatures on innovation and revealed that, awareness, usefulness, simplicity, compatibility, self efficacy and creditability of mobile banking service significantly affected consumer's intention to adopt and use mobile banking services provided by Access Bank. Additionally the study unveiled that, perceived credibility and perceived financial cost were the major setback with regards to customers adoption of mobile banking services provided by Access Bank, and as a result of this, Ghanaians have formed a negative behavioral pattern towards mobile banking. In addition, the findings showed that, perceived credibility and perceived financial cost have a stronger effect on consumer intention to adopt and use mobile banking service than perceived usefulness and perceived ease of use.

Ndumba et.al (2014) assessed the factors affecting the adoption of mobile banking in Kenya's commercial bank. This study employed a descriptive research design. The sample size for the research comprised of, data were collected from 67 customers through use of questionnaires.

The research results indicated that the adoption rate of mobile banking in Kenyan commercial bank is below target. The main reasons behind the low adoption of mobile banking service were risk of loss and fear of system failure. Customers' perceived risk was found to negatively affect adoption of M-Banking service. On the other hand, perceived convenience, trust, the reliability of M-Banking services was found to positively affect adoption of these services. In the same topic Yu (2009) studied factors influencing the use of Mobile Banking in the case of SMS-based Mobile Banking in New Zealand. The research adopted the basic concepts of the Technology Acceptance Model (TAM), as well as some constructs derived through a focus group discussion a survey questionnaire was developed and employed to collect data sample of 250 university students in New Zealand the results of the data analysis factors such as service quality and service awareness are influencing user perceptions about the usefulness of SMS mobile banking which in turn affect intention to use and adoption of mobile banking.

Laekemaryam (2015) examined factors affecting the adoption of mobile banking in commercial bank of Ethiopia based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model to identify the causal relationships between adoption of mobile banking and Performance expectancy, perceived risk, perceived cost, effort expectancy, trust, mobile banking service quality and behavioral intention items. The data were analyzed using AMOS version 23 and SPSS version 20. And the data was analyzed through descriptive statistics such as frequency, correlation and ANOVA. Each variable is measured using five point likert scale using primary data collection method, questionnaire were distributed to target respondents of customers of commercial bank of Ethiopia for mobile banking users. The findings of this study revealed that performance expectancy, perceived risk, perceived cost, effort expectancy and trust, were the factors affecting users having intention to adopt mobile banking. Meanwhile, the Mobile banking service quality was found to be insignificant in that study. Furthermore, the study also manages to present demographic variables effects toward behavioral intention to adopt mobile banking, and found that gender is non-significant factor for mobile banking adoption. Age and occupation is found as significant factor for adoption of mobile banking but educational qualification was not a significant factor for adoption of mobile banking in Ethiopian mobile banking user context.

Worku (2015), also studied the factors affecting adoption of mobile banking the case of commercial bank of Ethiopia in Addis Ababa city using the technology acceptance model and analyzed the data gathered using descriptive statistics such as frequency, percentage, mean, mode, median and standard deviation. Besides binary logistic regression analysis is conducted to understand the relationship of mobile banking adoption and perceived usefulness, perceived ease of use and perceived risk. The study found out that perceived usefulness and perceived ease of use have positive relationship with the adoption of mobile banking whereas perceived risk has negative relationship with the adoption of mobile banking.
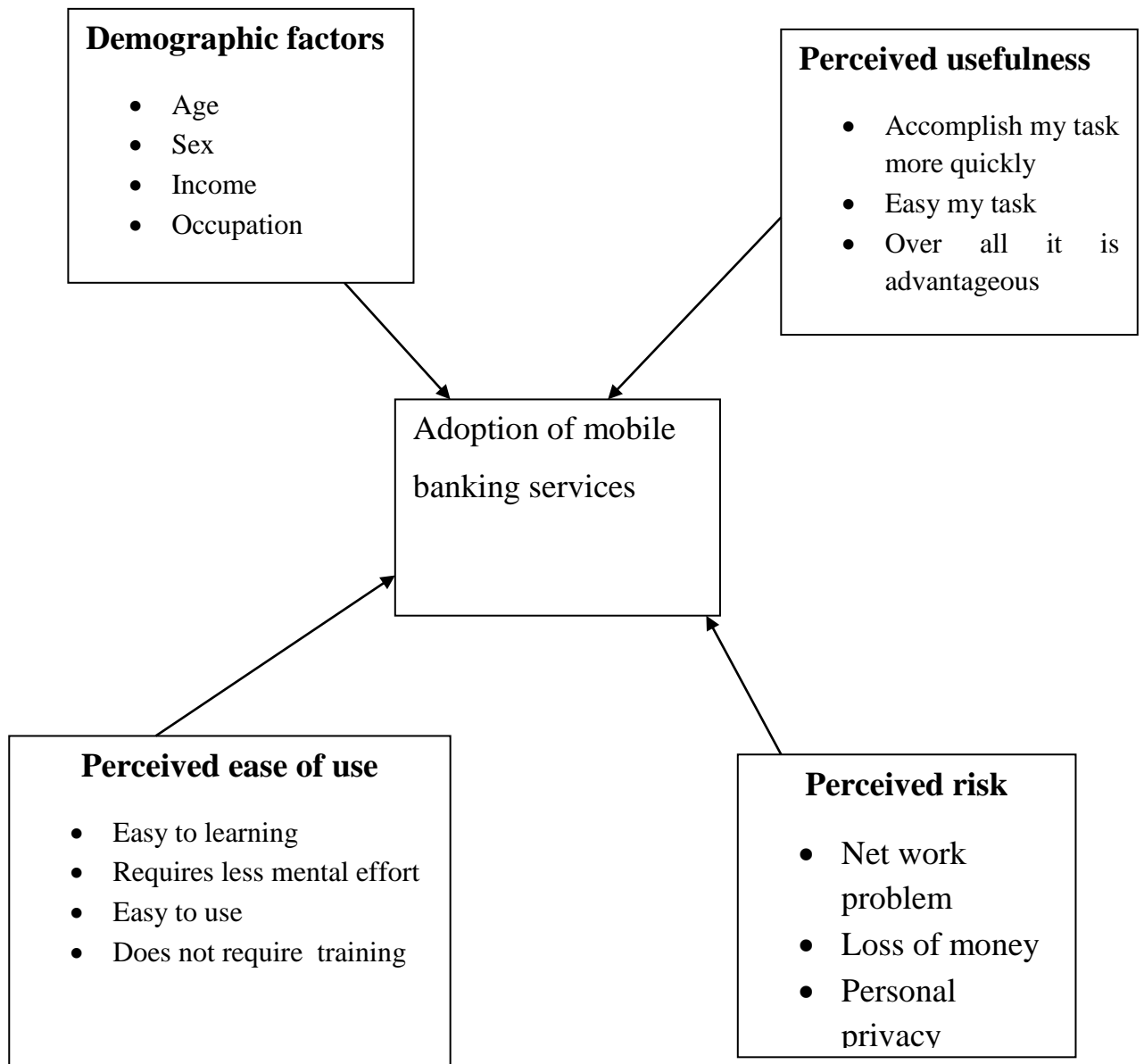
Ayana (2012) examined the barriers and drivers of the adoption of electronic banking system in Ethiopia. The study was conducted based on the data gathered from four banks in Ethiopia; three private banks (Dashen bank, Zemen bank and Wegagen bank) and one state owned bank (Commercial bank of Ethiopia). A research framework developed based on technology-organization-environment framework and Technology acceptance model guided the study. The result of the study indicated that 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 as the major determinants of adoption of electronic banking system in Ethiopia. The study also identified perceived ease of use and perceived usefulness as a driver of adopting E-banking system.

Muhammad et.al (2015) studied the determinants of e-banking adoption in Pakistan by adopting the TAM model and the framework of structural equation modeling (SEM). For that purpose, they have used Analysis of Moment Structures (AMOS) to test the hypothesized model. Overall, the empirical outcome suggests that the enjoyment had a greater total effect on perceived usefulness (PU) and perceived ease of use (PEOU) while, subjective norm shows greater total effect on the intention to use the e-banking service. And also Kwame et al (2014) studied on Applying Logistic Regression to E-Banking Usage in Ghana to meet the objective the researchers was used 241customers of three state-owned retail banks from Kumasi in Ghana, were used as sample for the survey. Responses gathered from the customers were mainly analyzed using a binary logistic regression and find that internet

banking; ATM, and mobile phone banking were the commonly identified e-banking services offered by the banks. Among such services, ATM was the most frequently patronized service whereas internet banking recorded very low patronage. From the chi-squared test of association, customer's operational bank and occupational status were found to have significantly informed the decision to use e-banking. With respect to the logit analysis, customer's operational bank, occupational status and monthly income were significant socioeconomic classification variables that informed customer's decision to use e-banking. And also (Edwin, 2015) examined the Empirical determinants of consumers' uptake of electronic banking in selected states of Nigeria. The research uses the consumer decision making process to identify factors that consumers use when deciding between electronic banking and non-electronic banking services. Factors include service quality dimensions, service product characteristics, perceived risk factors, user skill factors, and price factors. And the demographic variables include age, gender, marital status, ethnic background, educational qualification, employment, and income.

2.3 Conceptual framework

The study is going to be carried out using the conceptual framework presented below, which is drawn from the theoretical and empirical literature reviews discussed above.

Demographic factors

- Age
- Sex
- Income
- Occupation

Perceived usefulness

- Accomplish my task more quickly
- Easy my task
- Over all it is advantageous

Adoption of mobile

banking services

Perceived ease of use

- Easy to learning
- Requires less mental effort
- Easy to use
- Does not require training

Perceived risk

- Net work problem
- Loss of money
- Personal privacy

Chapter 3
Research Methodology

3.1 Research approach and design

The research approach in this study will be quantitative in nature which involves the use of primary and secondary data in order to answer the research questions and achieve its research objective. And this research is about the determinant adoption of mobile banking service in commercial bank of Ethiopia in the case of south Addis Ababa district. CBE is the largest commercial bank in the country as well as the pioneer in the m-banking service delivery in the country. The research adopted mainly causal/explanatory type of research design which relevant to achieve a research objective that aims at examining the relationship among the different factors adoption of mobile banking services.

3.2 Population and sampling

There are four districts in Addis Ababa. Under South Addis District of CBE, there are around 80 branches. All branches perform similar tasks, and share same role in achieving the Company's objectives. So, because of the homogeneity of those branches, the researcher used simple random sampling to select sample district. After selecting the sample district, the researcher will be uses stratified sampling to select the branches. The branch under this district differentiates in their grade level. Accordingly, since there are branches with grade level 1, 2, 3, and 4 and finally, since the willingness of respondents is very necessary, the researcher will be use convenience sampling technique to select sample respondents. There are around 1,295,150 (in January, 2017) customers in South Addis District of CBE. And there are 80 branches in the District. For the purpose of this research, to get the sample size of these 1,295,150 customers, the researcher used the confidence level of 95% and error of margin 5 %, Z score 1.96, and population proportion 0.5. So, the sample size is 384 customers.

$S=X^2Np (1-p)/d^2 (N-1) +p (1-P)$

Where

S= required sample size

X=z-value (1.96)

N=population size

P=population proportion

d=error of margin

$S = X^2 Np\,(1-p)/d^2\,(N-1) + p\,(1-P)$

$(1.96)^2(1295150*0.5)\,(1-0.5)/\,(0.05)^2(1295150-1) + (1.96)^2\,0.5(1-0.5)$

$1243862.06/3238.7765 = 384$

The formula adopts from Krejcie & Morgan (1970). After getting the sample size the researcher used stratified sampling technique to get those respondents the formula adopts from (http://stattrek.com). This is because the branches are classified by their grade level and the number of customers under such different branches varies accordingly.

Stratified sampling formula:

$nh = Nh/N*n$

Where:

Nh= is the population size for stratum *h*

N=Total population size

n=sample size

nh= is the sample size for stratum *h*

Table 3.1: sample size by using stratified sampling technique

Grade of Branches	Number of branches	Number of customers	Total Number of stratified sample
Grade 1	19	101205	101205/1295150*384 = 30
Grade 2	50	554779	554779/1295150*384 = 164
Grade 3	2	103442	103442/1295150*384 = 31

Grade 4	9	535724	535724/1295150 *384 =159
Total	80	1295150	384

Finally, convenience sampling technique will applied because the willingness of customers is necessary for getting the right data.

3.3 Data source and data collection method

The study is employ secondary and primary source of data to examine the determinant of mobile banking adoption in commercial banks. Secondary data is used mainly to have data about mobile banking customers and total bank customers, as a result secondary data will draw from CBE (Commercial bank of Ethiopia) itself national bank of Ethiopia and other publications while primary source of data will be draw commercial bank of Ethiopia customers from selected branches. In order to address the research objectives properly and effectively the researcher gathered primary data based on the questionnaire as an instrument. Data types for the research are personal profile of sample customers, their perception about mobile bank usefulness, ease of use and risk associated with the use of mobile banking.

3.4 Model specification and Data analysis method
3.4.1 Model specification

Based on the theoretical review and empirical considerations the following model will specify by using binomial logistic regression model. The mathematical (functional) expression of the model is given as follows:

$$\text{logit}(pi) = \beta 0 + \beta 1\ X1i + \beta 2 X2i + \cdots + \beta n Xni$$

Where Pi=is the probability of the presence of characteristic of interest.
The functional form of the regression model estimating the factors that affect the usage of mobile banking in the commercial bank of Ethiopia presented as follows:

Y= f (X$_1$, X$_2$, X$_3$, X$_4$, X$_5$, X$_6$, X$_7$, X$_8$,X$_9$,X$_{10}$,X$_{11}$,X$_{12}$,X$_{13}$, E)

   Where:

Y = Use of mobile banking; 1 if the respondent is mobile banking user; 0 otherwise

X1 = sex; 1 if male, 0 female.

X2 = Age level of the respondent.

X3 = monthly Income level of the respondent.

X4 = year of schooling

X5 = Fear of misuse of personal data; 1 if respondent is afraid that his/her personal data will

be misused; 0 otherwise.

X6 = Perceived security; 1 if respondent perceives commercial Bank's as secure, 0

otherwise.

X7=Perceived usefulness (relative advantage); 1 if respondents perceive mobile   banking is

useful, 0 otherwise.

X8= Perceived ease to use); 1 if respondents perceive mobile banking is easy to use, 0

otherwise.

X9=Occupation; 1 if the respondents are employed, 0 otherwise

X10=experience on technology; 1 if the respondents are experience on technology, 0

 otherwise

X11=service quality; 1 if respondents perceived service quality is there, 0other wise

X12=perceived cost; 1 if respondents perceived the service is costly, 0 other wise

X13=voluntarism to use; 1 if respondents are voluntary to use the service, 0 other wise

E=error term

The explicit estimable bi nominal logistic econometric model is formulated as follows

User = β$_0$ +β1x1+ β$_2$x2 +β$_3$x3 + β$_4$x4 +β5x5+ β6x6 + β7x7 + β8x8$_+$ β9x9+ β 10X10+ β 11X11+ β 12X12+ β 13X13+E

3.4.2. Data analysis method

A logistic regression technique will be employed to examine the factors influencing the adoption of mobile banking products. This technique will be employed to find the model which would best fit in describing the relationship between the dichotomous characteristic of interest (adoption intentions) and the thirteen independent variables.

3.5 Multicollinearity Test

A test of Multicollinearity is conducted to determine the correlation of the independent variables. Multicollinearity refers to the extent to which an independent variable can be explained by other independent variables in the analysis and if too high this can have harmful effect on regression. Multicollinearity occurs when two or more predictors in the model are correlated and provide redundant information about the response. It is a situation where the variables are too highly correlated. The correlations between constructs were checked for Multicollinearity and the results showed that the correlations between all constructs were measured by variance inflecting factor(VIF) which is greater than 10 multicolliniarity problem is there (Kline, 2005)

Chapter Four

Results and Discussion

Introduction

In this section analysis and discussion of the data gathered based on the research methodology designed for the research is conducted. For this purpose, statistical instruments called descriptive statistics as well as logistic regression analysis is used to perform data analysis. Besides the descriptive analysis inferential statistics is applied to find out the relationship of mobile banking adoption with determinant factors hypothesized in the research model.

4.1   Results of Descriptive Statistics

Table 4.1 descriptive statistics result for categorical variables

variables	Frequency	percentage
Age category		
18-30	232	64.08
31-40	74	20.44
41-50	29	8.01
51-60	17	4.69
Above 61	10	2.78
Total	**362**	**100**
Year of schooling		
0-6 year	46	12.71
6-10 year	34	9.39
11-15 year	227	62.71
16-20 year	55	15.19
Total	**362**	**100**

Monthly income		
No income	29	8.01
1-1000	13	3.59
101-3000	94	25.97
3001-5000	77	21.27
5001-10000	128	35.36
Above 10000	21	5.80
Total	**362**	**100**
M-banking services		
Checking account balance	78	21.55
Transferring money	66	18.23
To know daily exchange rate	53	14.64
To know near ATM location	18	4.97
Use all	147	40.61
Total	**362**	**100**

Source: Survey data (2017)

The age of majority of the respondents as shown from table 4.1 is between 18-30 years of age numerically 64.08 percent. Whereas 20.44 percent falls between the ages of 31-40 and that means more than 92.5 percent of the customers are within the age of 18- 50 years. The fact that the majority of the respondents are young and adult implies it is an opportunity for mobile banking adoption in the coming periods. Because the youth are often more adventurous and more fascinated by technology than the old (Daniel et.al, 2014).

Year of schooling attained by respondents as indicated by the table 4.1 above majorities of the respondents were learned from 11 up to 15 year which is 62.71 percent of the total respondents which is followed by learned from 16 up to 20 year which is 15.19 percent. That means most of CBE customers in south Addis Ababa district have higher educational status which is an opportunity to CBE to provide advanced services such as mobile banking since ease of use of the service will be better.

Referring to the table 4.1 above about the income level of the respondents among the total sample respondents 35.36 percent earn monthly income between 5001-10000 birr. Whereas 25.97 percent of the respondents earn monthly income between 1001-3000 birr and also 21.27 percent of the respondents earn monthly income between 3001-5000 .Hence most of the customers have income above the poverty line which is (1300 ETB) by international standard (World Bank, 2016).These is a good implication for mobile banking adoption as Jayawardhena(2000) said have high-level income customers are more likely to use electronic banking.

Among sample respondents who adopt mobile banking service 40.61 percent respond that they use all mobile banking service provided by Commercial Bank of Ethiopia as shown above in table 4.1. In the same table the highest used services are checking account balance which is 21.55 percent and money transfer18.23 percent. As can be seen the finding m-banking services the frequently used services are money transfer and account balance checking which are the traditional banking services and this implies that new services such payment using mobile banking needs to be pushed. So that customers will exploit the benefit of m-banking services by effecting payment wherever they are without incurring transportation and time cost.

Table 4.2 descriptive statistics result for binary variables

Variables	frequency	Percentage
Cell phone Ownership		
Yes	350	96.68
No	12	3.32
Total	**362**	**100**
M-banking awareness		
Yes	302	83.42
No	60	16.58
Total	**362**	**100**
Mobile Banking Adoption		

Yes	235	64.92
No	127	35.08
Total	**362**	**100**
Sex		
Male	197	54.42
Female	165	45.58
Total	**362**	**100**
Work status		
Employed	306	84.53
Unemployed	56	15.47
Total	**362**	**100**

Source: Survey data (2017)

With regard to cell phone ownership and usage as shown in table 4.2 above 96.68 percent of the sample respondents replied that they have cell phone and use it. On the other hand 3.32 percent of the respondents replied that they do not have cell phone personally.

The implication of this finding is that cell phone ownership is not hindrance for mobile banking adoption since the majority of bank customers in south Addis Ababa have cell phone.

The sample respondents' response with regard to the awareness of customers about the existence of mobile banking services as stated in table 4.2 above, 83.42 percent of respondents are aware of the existence of mobile banking service whereas only 16.58 percent of the respondents lack awareness about the existence of mobile banking service.

This implies that most CBE customers in south Addis Ababa know the existence of m-banking but this does not mean that customers have adequate information about m-banking since among those who respond that they know the existence of the services they need additional information about its usefulness, ease of use and risk.

In terms of usage of mobile banking services the respondents reply indicate that among the total respondents 64.92 percent use mobile banking as can be seen from the table 4.2 above. Whereas 35.08 percent of respondents replied that they totally not interested to use mobile banking service. This shows us commercial bank of Ethiopia specifically south Addis Ababa district needs to work hard to make customers understand about m-banking advantages in detail.

The respondent's gender profile indicates, as shown in the table 4.2 above, the majority of the respondents are male which accounts 54.42 percent of the sample respondents where as female respondents account for 45.58 percent of the sample respondents. This shows that women lag behind men in using banking services which may also affect adoption of mobile banking adoption since the base for mobile banking adoption in the bank led model of mobile banking is bank customers. It is similar with the study done by kohsay (2009), more males than females tend to adopt self service technology such as mobile banking and other similar technologies.

The result also shows in table 4.2 above about the work status of the respondents, most of them are employed which is 84.53 percent of the total respondents. And 15.47 percent are unemployed this is a good opportunity for mobile banking adoptions because those who are employed have time constraint since most of them are at work place when the bank branches are operational (have less time freedom). Hence, mobile banking will give them time saving advantage by enabling customers to make banking transactions and payments such as payment of utilities and other bills, money transfer etc. without traveling to the bank branches. This confirms the previous studies that said those who belong to the upper middle class and have high-level occupations are more likely to use electronic banking (Jayawardhena and Foley, 2000).

Table 4.3 Descriptive statistics of some independent variables

variable	Minimum	maximum	mean	Standard deviation
Age	18	72	31.41	11.34
Monthly	0	13650	4512.508	2990.61

Income				
Year of schooling	0	20	12.84807	4.250026

Source: survey data (2017)

Table 4.3 provides a summary of the descriptive statistics of the independent variables used in the model. The average age of respondents is 31.41 years with standard deviations of 11.34. The average monthly income of the respondents is 4512.508 birr. The average years in formal education are 12.84807, indicating that respondents on average are high school leavers.

4.2 Results of Logistic Regression

To examine the suitability of the logistic regression model, Omnibus Tests were conducted. The Omnibus Tests of Model Coefficients gives an overall indication of how well the model performed (Pallant, 2011). This is referred to as a 'goodness-of-fit' test. The results in Table 11 show that the test is highly significant (at $p<0.01$). Hence, the relationship between the independent variables and the dependent variable is verified. To diagnose the presence of multicolinearity in the logit model, the tolerance test or variance inflecting factor (VIF) was performed it shows how much of the variability of the specified independent variable is not explained by the other independent variables in the model. All the observed tolerance values are greater than 0.10, or the mean of VIF are less than 10 indicating that there is no problem of multicolinearity in the logistic regression model.

Table 4.4 Logistic regression result

Number of obs =   362
LR chi2 (13)   =   355.83
Prob > chi2   =   0.0000
Log likelihood = -56.6483   Pseudo R2   =   0.7585

USER	COFF	STD.ERR	Z	P>/Z/(p-value)	95%conf.interval	
SEX	1.865004	.6857836	-2.72	0.007***	-3.20911	-.520892
AGE	-.044545	.0326234	-1.37	0.172	-.108486	.0193954
INCOME	.003013	.0001268	2.38	0.017**	.0000528	.0005498
YSC	.0433	.0811271	0.53	0.593	-.115655	.2023573
FPD	.4963044	5876257	0.84	0.398	-.655420	1.64803
PS	2.068394	.6773716	3.05	0.002***	.7407699	3.396018
PU	2.463786	1.187	2.08	0.038**	.137309	4.790263
PEU	.9023438	.7071235	1.28	0.202	-.483592	2.28828
OCC	.8959842	.8862706	1.01	0.312	-.841074	2.633043
EOT	3.129682	.6603901	4.74	0.000***	1.835341	4.424022
SQ	.2655932	.6062855	-0.44	0.661	-1.45389	.9227046
PCO	-.7849749	.8946903	0.88	0.380	-.968585	2.538536
VTU	4.721606	.9231115	5.11	0.000***	2.912341	6.530872
CONS	-9.721673	1.980605	-4.91	0.000	-13.6035	-5.83975

***and ** represent 1%, and 5% level of significance, respectively.

Variable(s) entered on step: X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8 X_9, X_{10}, X_{11}, X_{12}, X_{13}, respectively.

4.2.1 Discussion and implications of logistic regressions finding

From Table 4.4 above the coefficient of sex (X_1) is 1.865 and the probability of the Wald statistic for the variable sex (X_1) is significant at one percent (P< 0.01). Thus, the null hypothesis that the β coefficient for sex (X_1) is equal to zero is rejected. It can be deduced from the result that males are more adopted than females. This confirms the hypothesis that male use of mobile banking innovations increases adoption. The finding is in agreement with that of previous research (Venkatesh & Davis, 2000) found that males and females differ significantly in several dimensions males exhibiting more positive beliefs and attitudes about E-commerce than females. They suggested that such differences stem from gender roles and socialization processes. Effort expectancy on intention was also moderated by gender. Previous studies have found a stronger proportion of perceived usefulness of mobile services among men than among women (Nysveen et al. 2005).

The hypothesis that higher incomes amongst customers increase the likelihood of adopting mobile banking innovations is accepted. This is because of the positive β value of 0.003 as we can see from regression table 4.4 above. It is often postulated that customers with higher income levels are more likely to adopt mobile banking products than their counterparts with low income levels (Kolodinsky *et al*., 2004). A study conducted in South Africa cited in Daniel (2014) by Singh (2004) also found that adopters of e-banking innovation are those in the high-income bracket. Although this finding confirms what is often found in the literature, it nonetheless makes a lot of sense since the interplay of income level and the other factors influencing innovation adoption could determine whether or not an innovation is adopted by higher-income clients.

Perceived security was found to be a significant factor for facilitating customers' adoption of mobile banking. As indicated by the β value of the regression result which is 2.06 which is significant at one percent. Thus, the hypothesis that perceived security has positive relation with the likelihood of mobile banking adoption is accepted. The results indicate that the level

42

of perceived security is positively related to the likelihood of consumers adopting mobile banking. The finding is different from the previous research showing that perceived security is an insignificant factor for predictor of mobile banking adoption that are done by (Bucevska et.al, (2011) in Ghana.

The study also finds that perceived usefulness (PU) of mobile banking innovations increases adoption of its services. This is indicated by a significant level of five percent and a beta (β) value of 2.46, which can be observed in logistic regression table (see Table 4.4). This shows that perceived usefulness has a significant and positive effect on the intention to adopt mobile banking products. The result supports studies by Kolodinsky *et al*. (2004) who established a positive relationship between perceived usefulness and the adoption of mobile banking services. This study also found that experience on technology has a positive and significant factor of mobile banking adoption at one percent level of significance. As we can see from table 4.4 experience on technology coefficient of beta (β) was 3.13 it can be deduced from the result that experienced customer has more adopted than non experienced customer in using mobile banking technology. The greater the level of experience on technology associate with the use of a particular self service product, the more likely they are to adopt it.

Several studies showed that prior similar experience, such as computer or internet use, strongly influence intention to use and usage behavior of a specific system (Venkatesh et al, 2003; Wu, Tao, & Yang, 2007), Venkatehs et al. (2003) suggested that an increase in experience would decrease the influence of effort expectancy and social influence on behavior intention to use. Kim and Malhotra (2005) and Venkatesh et al. (2003) confirm by showing that when user experience increase, effort expectance and social influence decrease. People who have more experience using similar system are more relying on instrumental basis rather than social basis because experience users of mobile devices or wireless internet are more skillful and easy to use mobile banking (Wang and Yang, 2005).

The results in Table 4.4 also indicate that voluntarism to use mobile banking technology has increases the likelihood of mobile banking adoption. The logistic regression result of beta (β) 4.72 which is significant at one percent level of significance indicates that bank customers who are voluntaries to use mobile banking are more likely to adopt (continue to use) than non voluntary customers to use mobile banking products. Voluntariness is the level to which an

individual can choose to use a system, image is the extent to which individuals believe the use of a system will increase their social status within a group or how well others perceive them (Venkatesh and Davis, 2000).

The predictive power of the model was tested using pseudo R Square tests (see Table 4.4). The result from this table indicates that 75.85 percent of the variations in the dependent variable are explained by the model or explanatory variable.

Chapter Five

Conclusion and Recommendation

5.1 Summery and conclusion

The research paper uses descriptive statistics as well logistic regression analysis model with additional variable of experience on technology and voluntarism to use mobile banking technology to understand customers' perception of the factors that affect adoption of mobile banking technology in the commercial bank of Ethiopia in case of south Addis Ababa district customers and following are the summary of the findings of the research and its implication. The responses of the sample respondents indicate that most of the respondents 83.42 percent of the respondents are aware of the existence of mobile banking. On the other hand even if most of the respondents are aware of the existence of mobile banking service only 64.92 percent of respondents use mobile banking services. However, 35.08 percent of sample respondents do not use mobile banking services.

The main objectives of this research are to understand the factors affecting mobile banking adoption in commercial bank of Ethiopia. The first specific objective of this research work is to examine the effect of demographic factors on the adoption of mobile banking technology by bank customers. The finding of the research shows that only sex is the significant factor for mobile banking adoption which are males are 1.865 more times used than females due to some factors.

The second objective of this research is to examine the effect of customers experience on technology and voluntarism to use, on the adoption of mobile banking in commercial bank of Ethiopia. The finding of the research shows that customers experience on technology and voluntarism to use has a positive relationship with mobile banking adoption and the most significant factor; customers has an experience on technology and have voluntarism to use the technology then based on empirical evidences about the research potential customer are ready to adopt the technology.

The third objective of this research work is to examine the influence of user's perceived risk on the adoption of mobile banking. The finding of the research shows that perceived risk such as fear of personal data has an insignificant factor for mobile banking adoption based on regression result.

And also the multiple regression analysis conducted in the research shows perceived usefulness has positive relationship with mobile banking adoption and customers also perceive mobile banking as useful. And if mobile technology is perceived as useful then based on the empirical evidences about research potential customer are ready to adopt the technology.

The finding also perceived security and income of the customer has positive relationship with mobile banking adoption and customers perceive mobile banking is secured for using the service and if mobile technology is perceived as secured to use and customers have higher income then based on empirical evidences about the research potential customer are ready to adopt the technology.

5.2 Recommendation

The study identified six important factors that influenced the adoption of mobile banking technology in commercial bank of Ethiopia. Mobile banking system is a new financial evolution in Ethiopia, but it's an important issue, because it has a great impact on the whole banking system, at the same time it's difficult and need a lot of efforts to be adopted and accepted by the banking industry, so it need a lot of efforts to succeed. Based on the above summery and conclusion, the researcher recommends the following points.

> ➤ Hence, policy makers of commercial bank of Ethiopia should concern on regulation about security issues, the manner in which mobile banking are implemented, identifying users, protecting users and how much money can be transacted, should be a major area the regulation should address.

> ➤ Ethio telecom as mobile network service provider shall give special attention to mobile banking technology from its side to provide reliable network to commercial banks specifically Commercial Bank of Ethiopia as the customers perceive the mobile network is not risky to adopt mobile banking.

> ➤ The banks have to initially target, the high income customers and male users to promote services such as mobile banking, so that the probability of adoption is more. Later on they can target other potential segments.

> ➤ Commercial bank of Ethiopia shall produce user guide for mobile banking services using various means such as booklets, flyers, and in electronic means such as website

based electronic documents to make users more experienced and knowledgeable about mobile banking so that the probability of adoption is more.

➢ Commercial bank of Ethiopia shall broaden the service portfolio under mobile banking technology to make the service more useful and as well to be perceived useful in the minds of its customers.

➢ Commercial Bank of Ethiopia in general and its south Addis Ababa districts in particular shall promote mobile banking services to its customers using various promotional tools appropriate to the target market so that it can increase the awareness and voluntarism to use the service and these increases the adoption level of the mobile banking technology.

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Appendix1

Multcolinearity test

Variable | VIF   1/VIF

----

vto | 2.75   0.363098

peu | 2.49   0.401086

pu | 2.41   0.415784

ps | 2.24   0.445990

eot | 2.09   0.477331

Income | 1.89   0.529197

sq | 1.65   0.606554

occ | 1.63   0.613660

ysc | 1.61   0.621535

age | 1.53   0.654650

fpd | 1.40   0.716179

pco | 1.30   0.769440

Sex | 1.20   0.832213

Mean VIF | 1.86

Questionnaire

ST. MARY UNIVERSITY SCHOOL OF GRADUATE STUDIES

DEVELOPMENT ECONOMICS

This questionnaire is designed by the final year Development Economics student of St. marry university for research project entitled "determinants of the use of mobile banking services in commercial bank of Ethiopia: in case of south Addis Ababa district". The information supplied by you is strictly held confidential and used for academic purpose only.

Thank you in Advance for your kind cooperation in filling up this questionnaire.

Section I

Fill the blank questions

1. Age (in years) --------------------------------------

2. Monthly income (in ETB) --------------------------

3. Year of schooling--------------------------------------

Section II

Please read each statement and put (√) on the space provided that suits you as best alternative.

4. Sex   1= [   ] male   2= [ ] female

5. Do you have a cell phone or use mobile phone?

      1= [   ] yes   2= [ ] no

6   Are you aware of the existence of mobile banking in commercial bank of Ethiopia?

    1= [ ] yes   2= [ ] no

7. Are you voluntary to use mobile banking service in commercial bank of Ethiopia?

    1= [ ] yes   2 = [   ] no

8. Do you use mobile banking services in commercial bank of Ethiopia?

        1= [ ] yes   2= [ ] no

9. If question number eight is yes for what purpose do you use of mobile banking services

1= [ ] for checking account balance

2= [ ] for transferring money

3= [ ] to know daily exchange rate

4= [ ] to know near ATM location

5= [ ] All

6= [ ] other specify-------------

10. Do you think that using mobile banking service is advantageous?

        1= [ ] yes   2= [ ] no

11. Do you think that use of mobile banking application is easy?

        1= [ ] yes   2= [ ] no

12. Do you have an experience on use of new technology?

        1= [ ] yes   2= [ ] no

13. If question number twelve is yes which type of technology is using?

1= [ ] basic computer skill

2= [ ] advanced software application

3= [ ] others specify--------------------------

14. Your attitude towards the use of mobile banking service is

        1= [ ] positive   2= [ ] negative

15. Are you employed?

        1= [ ] yes   2= [ ] no

16 if question number fifteen is yes what type of work you do?

1= [ ] government employed   2= [ ] NGO employed

3= [ ] self employed   4= [ ] private employed

5= [ ] other specify-----------------

17. If question number fifteen is no why you do not work?

1= [ ] student   2= [ ] house wife

3= [ ] retired   4= [ ] other specify

18. Do you believe that mobile banking service in commercial bank of Ethiopia is secured?

              1= [ ] yes   2= [ ] no

19. If question number eighteen is no what type of risk is you expect?

1= [ ] wrong input of account number when transferring money

2= [ ] system failure (hacking of your account balance)

3= [ ] fear of losing your privacy information

4= [ ] other specify-------------

20. Do you fear that use of mobile banking have a negative effect on your mobile data profile?

              1= [ ] yes   2= [ ] no

21. Do you think that use of mobile banking services is costly?

              1= [ ] yes   2= [ ] no

22. Do you think that there is a good mobile banking service at commercial bank of Ethiopia?

              1= [ ] yes   2= [ ]

Thank you!!!