

***Determinants of Customer Adoption of Electronic Banking in
Ethiopia: The Case of Commercial Bank of Ethiopia Jimma District***

*A Thesis Submitted to the School of Graduate Studies of Jimma University in
Partial Fulfillment of the Requirements for the Award of the Degree of
Master of Science in accounting and finance*

BY:

EWUNETU TADESSE



**JIMMA UNIVERSITY
COLLEGE OF BUSINESS & ECONOMICS
MSC IN ACCOUNTING & FINANCE PROGRAM**

MAY 29, 2015

JIMMA, ETHIOPIA

***Determinants of Customer Adoption of Electronic Banking in
Ethiopia: The Case of Commercial Bank of Ethiopia Jimma District***

BY:

EWUNETU TADESSE

Under the guidance of
Ato Daniel Tolesa (Asst. Prof)

And

Ato Tadele Tesfay



*A Thesis Submitted to the School of Graduate Studies of Jimma University in
Partial Fulfillment of the Requirements for the Award of the Degree of
Master of Science in accounting and finance*

JIMMA UNIVERSITY

MSC IN ACCOUNTING & FINANCE PROGRAM

MAY 29, 2015

JIMMA, ETHIOPIA

JIMMA UNIVERSITY
COLLEGE OF BUSINESS & ECONOMICS
MSC IN ACCOUNTING AND FINANCE PROGRAM

Board of Examination Thesis

Approval Sheet

Members of the Board of Examiners

| | | |
|-------------------|-----------|-------|
| External Examiner | Signature | Date |
| _____ | _____ | _____ |
| Internal Examiner | Signature | Date |
| _____ | _____ | _____ |
| Advisor | Signature | Date |
| _____ | _____ | _____ |
| Co-advisor | Signature | Date |
| _____ | _____ | _____ |
| Chairperson | Signature | Date |
| _____ | _____ | _____ |

JUNE 2015

JIMMA, ETHIOPIA

CERTIFICATE

This is to certify that the thesis entitles “*Determinants of customer adoption of Electronic Banking in Ethiopia the case of commercial bank of Ethiopia Jimma District*”, Submitted to Jimma University for the award of the Degree of Master of science in Accounting and Finance and is a record of bona fide research work carried out by Mr.*Ewunetu Tadesse*, under our guidance and supervision.

Therefore, we hereby declare that no part of this thesis have been submitted to any other university or institutions for the award of any degree or diploma.

Main Adviser’s Name

Date

Signature

Co-Advisor’s Name

Date

Signature

DECLARATION

I hereby declare that this thesis entitled “*Determinants of customer adoption of Electronic Banking in Ethiopia the case of commercial bank of Ethiopia Jimma District*” has been carried out by me under the guidance and supervision of Ato Daniel Tolesa (Asst. Prof) and Ato Tadele Tesfay.

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

Researcher’s Name

Date

Signature

Abstract

This study aims to examine determinants of customer adoption of E-banking in Ethiopia. The study were conducted based on the data gathered from the customers of commercial bank of Ethiopia jimma district by classifying them in to three stratums based on their educational and income level. A mixed research approach were used to answer the research questions that emerge through the review of existing literature and the experiences of the researcher in respect to the electronic banking system in Ethiopia. The study analyzes data obtained from the survey questionnaire using the statistical package for social science (SPSS). The result of the study indicated that, from the tested five variables computer experience, income level and educational level have a positive significant influence on the adoption of electronic banking while fear of security have a negative significance influence and the rest variable age doesn't have a significance influence on the adoption of electronic banking. The study suggests a series of measures, which can take by the banking industry to address the findings observed in the study. These measures include the banks must make their electronic banking as simple and easy to use as possible. They must work on minimizing the security issues related to the adoption of the system by developing different mechanisms and working with its customers to enhance the sustainability and improvement in adoption of the system. The banks must plan how to give information related to the system to its customers to improve the adoption of the system in a successful manner.

Acknowledgement

First, I want to thank the Almighty God who helps me through his infinite mercy and grace throughout the duration of the programme, then my dearest grateful goes to my advisor **Mr. Daniel Tolesa (Asst. Prof.)** and my co-adviser **Mr. Tadele Tesfay** for the precious comments and suggestions during the course of this study.

I am extremely indebted to all members of my family especially, my mother Tsige Teressa, my father Tadesse Disassa and my wife Hana W/Meskel for their support by giving moral starting from the beginning of my education.

Finally, I would like to express my deep gratitude to the staffs and managers of world vision Ethiopia Gechi area program and Jimma & Illuababora Cluster program office especially for finance team members and the leader for their great contribution in my study by covering my duties when I am on conducting this study and my exam time.

Table of Content

| | |
|--|-----|
| <i>Abstract</i> | i |
| <i>Acknowledgement</i> | ii |
| <i>Table of Content</i> | iii |
| <i>List of Table</i> | v |
| <i>List of Figures</i> | vi |
| ACRONYMS..... | vii |
| | |
| CHAPTER ONE: INTRODUCTION..... | 1 |
| 1.1 Background of the Study..... | 1 |
| 1.2 Statement of the Problem..... | 2 |
| 1.3 Objective of the Study | 3 |
| 1.4 Significance of the study..... | 4 |
| 1.5 Hypothesis..... | 4 |
| 1.6 Scope of the study..... | 6 |
| 1.7 Limitation of the Study | 6 |
| 1.8 Structure of the thesis..... | 7 |
| CHAPTER TWO: LITERATURE REVIEW..... | 8 |
| 2.1 Theoretical literature..... | 8 |
| 2.1.1 Definition of Electronic Banking | 8 |
| 2.1.2 Forms of E- Banking | 8 |
| 2.1.3 The evolution of E- banking system..... | 9 |
| 2.1.4 Why Electronic Banking?..... | 9 |
| 2.1.5 Electronic Banking system in Ethiopian banking industry..... | 10 |
| 2.1.6 Factors affecting Electronic banking..... | 12 |
| 2.2 Empirical studies related with Electronic banking adoption..... | 14 |
| CHAPTER THREE: RESEARCH METHODOLOGY..... | 26 |
| 3.1 Research Design | 26 |
| 3.2 Research Approach..... | 26 |
| 3.3 Research Strategy | 27 |
| 3.4 Population, Sampling techniques and sample size determination..... | 28 |

| | |
|--|----|
| 3.5 Method of Data Collection | 30 |
| 3.6 Study Variables..... | 30 |
| 3.7 Method of Data Analysis, Interpretation and Discussion | 31 |
| CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION | 32 |
| 4.1 Introduction | 32 |
| 4.2 Descriptive Analysis | 32 |
| 4.2.1 Demographic Profile of respondents | 33 |
| 4.2.2 The Relation of demographic profile with adoption of electronic banking | 34 |
| 4.2.3 The general information of respondents | 39 |
| 4.2.4 Relationship of general Information of the respondents with Adoption of Electronic Banking | 40 |
| 4.1.5 The attitude on the adoption of electronic banking by customers of banks | 42 |
| 4.3 Regression analysis | 45 |
| 4.3.1 Test of classical linear regression Model | 45 |
| 4.2.2 Hypothesis Testing | 50 |
| 4.2.3 Regression model estimation and interpretation | 55 |
| CHAPTER FIVE: SUMMERY OF FINDINGS, CONCLUSION AND RECOMMENDATION | 57 |
| 5.1 Summery of findings and Conclusion | 57 |
| 5.3 Recommendation | 58 |
| | |
| BIBLIOGRAPHY | 60 |
| APPENDIX I: QUESTIONER ENGLISH VERSION | 67 |
| APPENDIX II: QUESTIONER AMHARIC VERSION | 73 |

List of Table

| | |
|--|----|
| Table 1: Sample size determination for each stratum | 30 |
| Table 2: Demographic profile of respondents | 34 |
| Table 3: Relation of Gender with adoption of E-Banking | 35 |
| Table 4: the relation of age with adoption of E - Banking | 36 |
| Table 5: The relation of educational level with adoption of E-Banking..... | 37 |
| Table 6 : The Relation of Monthly income and adoption of E-Banking | 38 |
| Table 7: The general Information of respondents..... | 39 |
| Table 8 : the relation of computer experience and Adoption of E-Banking | 41 |
| Table 9 : The relation of fear of security and adoption of E-Banking | 42 |
| Table 10 : The attitude of Respondents with the adoption of banking 1 | 43 |
| Table 11 : The attitude of Respondents with the adoption of banking 2 | 43 |
| Table 12: The attitude of Respondents with the factors of adoption of banking..... | 44 |
| Table 13 : Heteroscedasticity test | 45 |
| Table 14 : Test of autocorrelation | 46 |
| Table 15 : Person correlation..... | 49 |
| Table 16 : Variance inflation factor | 49 |
| Table 17 : The significance of correlation of Computer Experience and Adoption of E-Banking | 50 |
| Table 18 : ANOVA table of Computer Experience with Adoption of E-Banking..... | 50 |
| Table 19 : Significance of correlation of age and adoption of E-Banking..... | 51 |
| Table 20 : ANOVA table of age with adoption of E-Banking | 51 |
| Table 21 : Significance correlation of monthly income and adoption of E-Banking | 52 |
| Table 22 : ANOVA table of monthly income with adoption of E-Banking | 52 |
| Table 23 : Significance correlation of educational level and adoption of E-Banking | 53 |
| Table 24 : ANOVA table of educational level with adoption of E-Banking | 53 |
| Table 25 : Significance correlation of Fear of Security and adoption of E-Banking | 54 |
| Table 26 : ANOVA table of fear of security with adoption of E-Banking | 54 |
| Table 27 : Estimation model of the regression | 55 |
| Table 28 : Classification of the dependent variable | 55 |
| Table 29 : Estimation of coefficients of the logistic regression | 56 |

List of Figures

Figure 1 : Histogram47
Figure 2 : P-P normal Plot47

ACRONYMS

ATM - Automated teller machine

AVR - Automated Voice Response

BLUE - best linear unbiased estimator

CBE - Commercial bank of Ethiopia

CLRM - Classical Linear Regression Model

DW - Durbin Watson test

E- Banking - Electronic banking

ECX - Ethiopian Commodity Exchange

EFT - Electronic Fund Transfer

ETB - Ethiopian birr

ICT - Information communication technology

OLS - ordinary least square

PIN - Personal Identification Number

POS - Point of sell terminal

PSBs - Public sector banks

SPSS - statistical package for social science

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Banks play a prominent role in improving economic efficiency by channelizing funds from resource surplus sectors to those sectors that are deficient, yet possessing better productive investment opportunities. Banks also play a vital role in trade and payment system by significantly reducing transaction costs and increasing convenience (NCA, 2006). Banks has been significantly affect by the evaluation of technology; competition between banks has forced them to find new market to expand, the number of financial institutions and the expansion in using of E-commerce in different developing countries that offer electronic banking products increased. Hence, banks have begun to offer electronic banking services to improve the effectiveness of distribution channels through reducing the transaction cost and increasing the speed of services. Recently, electronic banking has become the way for the development of banking system, and the role of electronic banking is increasing in many countries. It offers opportunities to create services processes that demand few internal resources, and therefore, lower cost. As well as it provides wider availability and possibility to reach more customers.

From the customers' point of view, electronic banking allows customers easier access to financial services and time saving in managing their finance (Almazari and Siam, 2008; Ayriga, 2011; Tan and Teo, 2000). Indeed, the emergence of electronic banking has prompted many banks to develop marketing and information technology strategies in order to stay competitive.(Venkatesh et.al, 2003) noted that the successful implementation of information systems is dependent on the extent to which such a system to being use and eventually adopted by the potential users. Information system implementation is not likely to consider successful if users are unmotivated to use that type of technology, and thus it will not bring full benefits to the organization. In order to motivate customers to use electronic banking, banks must make key improvements that address the customers' concerns. Therefore, it is necessary to understand the key factors that influence the adoption of electronic banking among the banking customers.

Ethiopia has an emerging economy with a growing financial sector. With a double-digit growth and internal stability unlike most economies in the African continent, Ethiopia is surging ahead to be a leader in the horn of Africa in the financial sector (Mohammed, 2014). Electronic distribution channels provide alternatives for faster delivery of banking services to a wider range of customers; a very fast advancement in electronic distribution channels has produced tremendous changes in the financial industry in the recent years with an increasing rate of change in technology and competition among participants (Huges, 2001). Information Technology based distribution channels also reduce personal contact between the service providers and the customers, which inevitably leads to a complete transformation of traditional bank-customers relationships.

1.2 Statement of the Problem

The Ethiopian banking industry is one of the service industries crucial to the growth of its emerging economy. Banking is important in the role it plays in capital mobilization and granting of financial facilities that is crucial to business development and growth. As business always, need to find ways of improving its products and service deliveries. In this regard the advancement in technology in the area of the information and communication technology gives an opportunity to improve its service by developing electronic banking system but the implementation of the system in the financial institutions of developing Countries like Ethiopia were not that much enough (Mohammed, 2014). Technological innovations play a crucial role in banking industry by creating value for banks and customers, that it enables customers to perform banking transactions without visiting a brick and mortar banking system. On the other hand, Electronic Banking has enabled banking institutions to compete more effectively in the global environment by extending their products and services beyond the restriction of time and space (Turban, 2008). However, mirroring the development of E-commerce, the adoption and diffusion of electronic banking system not well developed in Ethiopia (Garedachew, 2010).

In order to encourage further Electronic Banking adoption in developing countries, a better understanding of the factors that affects Electronic Banking in a positive or negative direction was a critical thing and major item to implement the system in

effective and efficient way (Zhao et al, 2008). By gaining an in-depth understanding of the factors and conditions that influence developing country's ability to fully implement and realize its benefits, strategic implications could be generate for the researchers and practitioners regarding how to promote the growth of electronic banking in Ethiopia. However, despite the importance of the implementation of E- Banking, limited studies are currently available at developing Countries, especially in Ethiopia (Mohamed, 2014), (Ayana, 2014), (Garedachew, 2010), (Wondesen and Tsigai, 2010).

A review of electronic banking studies shows that a large portion of the published research conducted in developed and industrialized countries. One of the reasons for the limited empirical studies in the developing countries is that the introduction of electronic banking is relatively new in this region. Therefore, more studies are still required to understand the relevance of electronic banking in the country to identify areas in which the country lags behind that inhibit their electronic banking adoption and diffusion.

In Ethiopia, the study conducted by Mohamed, (2014), Ayana, (2014), Garedachew, (2010), Wondesen and Tsigai, (2010), focuses on the challenges and opportunities of the adaption of E-banking while this study designed to address the determinates of electronic banking adaption from the customer side. Therefore, to address the current gap in the literature, this study designed to identify the determinants of electronic banking that affects the effective implementation in Ethiopia.

1.3 Objective of the Study

The general objective of the study is to identify the factor that affects the customer adoption of electronic banking in Ethiopia.

Specific objectives:-

- ✓ to investigate the effect of prior computer experience on the adoption of electronic banking
- ✓ to identify the effect of age on the adoption of electronic banking
- ✓ to investigate the impact of education on adoption of electronic banking
- ✓ to analyze the impact of income level on the adoption of electronic banking
- ✓ to identify the effect of fear of security on adoption of electronic banking

1.4 Significance of the study

The outcomes and results of this research have potential value to financial institutions, particularly banks to understand the factor that affects their implementation related to electronic banking service to their customers. In addition, this study expected to help other researchers who will be interested to conduct further study regarding the determinants of electronic banking. Finally, based on the factors found to be influencing bankers decision on electronic banking system, the study may provide recommendations for banks about the action needs to be taken to implement Electronic Banking in Effective way.

1.5 Hypothesis

In order to achieve the objective of the study, a number of hypotheses developed from different research done outside Ethiopia, taken with the context of our country in the views of the researcher, and tested regarding the determinants of the adoption of Electronic Banking in Ethiopia. The following hypotheses formulated as follows:

Computer skills. One may well expect that there exist interconnections between technologies such that the diffusion of any technology is dependent of the diffusion of another technology (Stone and Kwon, 1993). Electronic Banking is one of the technologies that are quite dependent on computer networks. Bayus (1987) and Norton and Bass (1987) noted that a consumer's willingness to adopt a new technology is affected by his or her prior pattern of adopting related technologies, and the influence of one technology on the next generation of that innovation is expected to be positive especially when the relationship between two technologies is complementary.

Karjaluoto et al. (2002) indicated that prior computer experience such as Internet, e-mail, etc had the most significant impact on Electronic Banking. Prior experience of technologies, especially prior experience of computers, had impact on consumer beliefs and attitudes towards related systems and technology (Arndt et al., 1985; DeLone, 1988; Igbaria et al., 1995; Karjaluoto et al., 2002; Levin and Gordon, 1989).

In this study, prior experience of computer used as a proxy for adoption of electronic banking and the hypothesis were developed as follows:-

H₁: The Computer experience of customers of the banks will have a positive significant influence on the Electronic Banking service in Ethiopia.

Age: In addition to the Customers experience in the use of computer, the demographics factors should effect the adoption of Electronic Banking. Age affects the attitude of individuals towards electronic banking and their ability to learn how to invest. We expect to find that consumers in the young age group are more likely to invest the time to learn to use electronic banking because young consumers can create more benefits through time saving (Byoung, et.al n.d).

H₂: The age of the customer of the banking service will have a positive significant influence on the adoption of electronic banking service in Ethiopia.

Income Level: In addition, consumers with higher income have higher value of time more than, the consumers with lower income, so consumers with high income can create more benefits through adoption of electronic banking. In addition, consumers with higher levels of financial assets benefit from the time saving (Byoung, et.al n.d).

H₃: The Income level of customers of bank will have a Positive significant influence on adoption of Electronic Banking service in Ethiopia.

Educational Level: Bartel and Sicherman (1998) indicated that individuals that are more educated might require less training in response to technological change if their general skills enable them to learn the new technology. Gronau and Hamermesh (2001) investigated differences in demand according to differences in the opportunity costs of various activities. They indicated that well educated individuals have better home productivity than less educated individuals because they can produce household goods with relatively smaller inputs and time. In addition, well-educated individuals have relatively higher income. Therefore, well-educated individuals have greater value of time than less educated individuals do.

H₄: The Educational Level of Customers of banks will have a positive significance effect on the adoption of Electronic Banking Service in Ethiopia

Fear of Security: Security is simply the protection of interests. People want to protect their own money and bank their own exposure. The role of government is to maintain the integrity of and confidence in the whole system. With electronic cash, just as with paper cash today, it will be the responsibility of government to protect against systemic risk. This serious role cannot be left to the micro-economic interests of commercial organizations. The security of information may be one of the biggest concerns to the Internet users. For electronic banking users who most likely connect to the Internet via dial-up modem, faced with a smaller risk of someone breaking into their computers. Only organizations such as banks with dedicated Internet connections face the risk of someone from the Internet gaining unauthorized access to their computer or network. Moreover, the electronic banking system users also concern about non-reputability, which requires a reliable identification of both the sender and the receiver of on-line transactions. Non-secure electronic transaction can be altered to change the apparent sender. Therefore, it is extremely important to build in non-reputability, which means that the identity of both the sender and the receiver can be attested to by a trusted third party who holds the identity certificates (Yang, 1997).

H₅: The higher the fear of the security of the customer has a negative significant influence on the adoption of electronic banking service in Ethiopia.

1.6 Scope of the study

This study was conducted on the identified determinants of customer adoption of electronic banking at commercial bank of Ethiopia Jimma district typically in Jimma town because from the location of the branch's under the district customers of branch's of Jimma town are easily accessible for the study and to form strata that helps to achieve the study objectives. Therefore, customers of commercial banks of Ethiopia in Jimma town selected as a sample for this study by classifying into three strata.

1.7 Limitation of the Study

To conduct this research in all customers of commercial banks of Jimma district it is difficult. To accomplish easily the study objectives because the study designed in line with the stratified random sampling method as the reason in other town it makes difficult to form strata as defined by the researcher. Hence, the area of research study were only

limited in Jimma town and not included other town customers. Time control and financial constraint are also other limitation for not to include other town in Ethiopia. The other limitation for this study there was lack of adequate information on the study area as it is new implementation in our country, there is limited research undertaken previously and during data gathering it is very much difficult to get information especially, from one stratum consists of the group of merchants.

1.8 Structure of the thesis

This thesis contains five chapters. Chapter one presents introduction. This chapter intends to give introductory view to the reader about the thesis work by providing information's like problem statement, objectives, significance, scopes, limitations and how the whole thesis is organized or structured. Chapter two presents Review of related literature: This chapter consists of review in detail the Literature available in the area of electronic banking to give the reader both theoretical and empirical back background. Chapter three provides the research design part of the study: This chapter describes different aspects of the methods used in the study. The purpose of this chapter is to make the reader to understand the methodological choices used in the study. Chapter four presents results and analysis of findings. Finally, chapter five presents study's conclusions part that encompasses summaries of findings, conclusions and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical literature

2.1.1 Definition of Electronic Banking

The Definition of Electronic Banking has given in different way by different scholars. According to Kamrul (2009), Electronic Banking is a form of banking service, where funds transferred through an exchange of electronic signal between financial institutions, rather than exchange of cash, checks, or other negotiable instruments. Or electronic banking, also known as electronic funds transfer (EFT), is simply the use of electronic means to transfer funds directly from one account to another, rather than by check or cash.

The term of Electronic Banking often refers to online banking/Internet banking which is the use of the Internet as a remote delivery channel for banking services (Furst and Nolle, 2002). With the help of the internet, banking is no longer bound to time or geography. Consumers all over the world have relatively easy access to their accounts 24 hours per day, seven days a week.

Another definition of Electronic Banking is that Electronic Banking is the use of a computer to retrieve and process banking data (statements, transaction details, etc.) and to initiate transactions (payments, transfers, requests for services, etc.) directly with a bank or with other financial service provider remotely via a telecommunications network (Yang, 1997). It should note that electronic banking is a bigger platform than just banking via the internet.

2.1.2 Forms of E- Banking

Automated Teller Machines (ATM) - It is an electronic terminal, which gives consumers the opportunity to get banking service at almost any time. To withdraw cash, make deposits or transfer funds between accounts, a consumer needs an ATM card and a personal identification number (Malak, 2007).

Point-of-Sale Transfer Terminals (POS) - The system allows consumers to pay for retail purchase with a check card, a new name for debit card. This card looks like a credit

card but with a significant difference. The money for the purchase is transferred immediately from account of debit cardholder to the store's account (Malak, 2007).

Internet / extranet banking- It is an electronic home banking system using web technology in which Bank customers are able to conduct their business transactions with the bank through personal computers (Malak, 2007).

Mobile banking- Mobile banking is a service that enables customers to conduct some banking services such as account inquiry and funds transfer, by using of short text message (Malak, 2007).

2.1.3 The evolution of E- banking system

Electronic innovation in banking industry can be traced back to 1970, when the computerization of financial institutions gained momentum (Malak 2007), However; a visible presence of this was evident to the customers since 1980, with the introduction of ATM. Innovative banking has grown since then, aided by technological developments in the telecommunications and information technology industry. The early decade of the 1990s witnessed the emergence of automated voice response (AVR) technology. By using the AVR Technology, banks could offer telephone-banking facilities for financial services. With further advancements in technology, banks were able to offer services, through PC owned and operated by costumers at their convenience, with intranet propriety software. The users of these services were, however, mainly corporate customers rather than retail ones (Sohail and shanmugham 2003).

2.1.4 Why Electronic Banking?

There are no other inventions, which change business of banking as quickly as the electronic banking revolution. World over banks are reorienting their business strategies towards new opportunities offered by Electronic Banking. Electronic Banking has enabled banks to scale borders, change strategic behavior and thus bring about new possibilities. Electronic Banking has moved real banking behavior closer to neoclassical economic theories of market functioning. Due to the absolute transparency of the market, clients (both business as well as retail) can compare the services of various banks more easily. For instance, on the internet, competitors are only one click away. If clients are

not happy with the products, prices or services offered by a particular bank, they are able to change their banking partner much more easily than in the physical or real bank-client relationship. From the banks' point of view, use of the internet has significantly reduced the physical costs of banking operations. As discussed by Turner (2001), progress in information technology has slashed the costs of processing information, while the internet has facilitated its transmission, thus facilitating change in the very essence of the banking business. Around the world, electronic banking services, whether delivered online or through other mechanisms, have spread quickly in recent years.

2.1.5 Electronic Banking system in Ethiopian banking industry

The appearance of Electronic Banking in Ethiopia goes back to the late 2001, when the largest state owned, commercial bank of Ethiopia (CBE) introduced ATM to deliver service to the local users. In addition to eight ATM Located in Addis Ababa, CBE has had Visa membership since November 14, 2005. However, due to lack of appropriate infrastructure it failed to reap the fruit of its membership. Despite being the pioneer in introducing ATM based payment system and acquired visa membership, CBE Lagged behind Dashen bank, which worked aggressively to maintain its lead in E-payment system. As CBE continues to move at a snail's pace in its turnkey solution for Card Based Payment system, Dashen Bank remains so far the sole player in the field of Electronic Banking since 2006. (Gardachew 2010)

Dashen bank, a forerunner in introducing Electronic Banking in Ethiopia, has installed ATMs at convenient locations for its own cardholders. Dashen's ATM is available 24 hours a day, seven days a week and 365 days a year providing service to Debit Cardholders and International Visa Cardholders coming to the country. At the end of June 2009, Dashen bank has installed more than 40 ATMs in its area branches, university compounds, shopping malls, restaurants and hotels. In the year 2011 the payment card services have witnessed significant strides, Dashens ATM service expanded to 70 and 704 POS terminals (Dashen, 2011).

Available services on Dashen Bank ATMs are Cash withdrawal, Balance Inquiry, Mini statement, Fund transfer between accounts attached to a single card and Personal Identification Number (PIN) change. Currently, the bank gives debit card service only for

Visa cards. Dashen bank clients can withdraw up to 5,000 birr in cash and can buy goods and services up to 8,000 to 13000 birr per day. Expanding its leadership, Dashen Bank has begun accepting MasterCard in addition to Visa cards. Dashen won the membership license from MasterCard in 2008 (Dashen, 2011).

Harnessing its leadership with advanced banking technology, Dashen Bank signed an agreement with iVery, a South African E-payment technology company, for the introduction of mobile commerce in April 21, 2009. According to the agreement, iVery Payment Technologies has licensed its Gateway and MiCard E-payment processing solution to Dashen Bank. Dashens Mod birr users can transfer 500 birr to other Modbirr users in 24 hours a day. This would make Dashen Bank the first private bank in Ethiopia to acquire E-commerce and mobile merchant transactions (Amanyehun 2011). Although Dashen's new technology is one-step ahead in that it allows transfer of funds from one's account to others, the first ever Electronic Banking gateway was signed between Ethiopian Commodity Exchange (ECX) and Dashen Bank and CBE. The Electronic Banking system developed with both banks designed to give a secure electronic data-sharing gateway between clients, banks and ECX, by facilitating a smooth transaction (Abiy, 2008)

By the end of 2008 Wegagen Bank has signed an agreement with Technology Associates (TA), a Kenyan based information technology (IT) firm, for the development of the solutions for the payment system and installation of a network of ATMs on December 30, 2008,.

Zemen Bank, the only Ethiopian bank anchored in the idea of single branch banking, by launching full-blown internet banking, a service which is new to Ethiopian banking industry in the year 2010. The bank tested the venture through its first phase of the online service, and now it is already started the full-fledged version, which enable customers to make online money transfer freely. Previously, the online banking service, delivered by the bank, only gave access to bank statements and exchange rate information. The new and never-been-tried service proposed by the bank is to include free account money transfer, corporate payroll uploading system where employers could upload payroll to the

system and make payments to individual worker's accounts online and online utility bill settlement system, when utility companies are ready(Asrat 2010).

The agreement signed by three private commercial banks to launch ATM and POS terminal network, in February 2009 is welcoming strategy to improve electronic card payment system in Ethiopia. Three private commercial banks - Awash International Bank S.C., Nib International Bank S.C. and United Bank S.C. have agreed in principle to establish an ATM network called Fattan ATM network. If everything goes as planned, Fattan ATM will install over 140 ATM machines and over 340 POSs across Ethiopia. There will be one ATM at every branch of the consortium banks, all domestic airports serviced by Commercial service, shopping complexes and merchants. The agreement is the first significant cooperation between competing banks in Ethiopia, which others should be encouraged to follow as there is no single bank in Ethiopia that can afford to provide Extensive geographical coverage and access (Binyam 2009).

2.1.6 Factors affecting Electronic banking

Computer skills. One may well expect that there exist interconnections between technologies such that the diffusion of any technology is dependent of the diffusion of another technology (Stone and Kwon, 1993). Electronic Banking is one of the technologies that are quite dependent on computer networks. Bayus (1987) and Norton and Bass (1987) noted that a consumer's willingness to adopt a new technology is affected by his or her prior pattern of adopting related technologies, and the influence of one technology on the next generation of that innovation is expected to be positive especially when the relationship between two technologies is complementary.

Karjaluoto et al. (2002) indicated that prior computer experience such as Internet, e-mail, etc had the most significant impact on Electronic Banking. Prior experience of technologies, especially prior experience of computers, had impact on consumer beliefs and attitudes towards related systems and technology (Arndt et al., 1985; DeLone, 1988; Igbaria et al., 1995; Karjaluoto et al., 2002; Levin and Gordon, 1989).

Age: In addition to the Customers experience in the use of computer, the demographics factors should effect the adoption of Electronic Banking. Age affects the attitude of

individuals towards electronic banking and their ability to learn how to invest. We expect to find that consumers in the young age group are more likely to invest the time to learn to use electronic banking because young consumers can create more benefits through time saving (Byoung, et.al n.d).

Income Level: In addition, consumers with higher income have higher value of time Greaterthan consumers with lower income, so consumers with high income can create more benefits through adoption of electronic banking. In addition, consumers with higher levels of financial assets benefit from the time saving (Byoung, et.al n.d).

Educational Level: Bartel and Sicherman (1998) indicated that individuals that are more educated might require less training in response to technological change if their general skills enable them to learn the new technology. Gronau and Hamermesh (2001) investigated differences in demand according to differences in the opportunity costs of various activities. They indicated that well educated individuals have better home productivity than less educated individuals because they can produce household goods with relatively smaller inputs and time. In addition, well-educated individuals have relatively higher income. Therefore, well-educated individuals have greater value of time than less educated individuals do.

Fear of Security: Security is simply the protection of interests. People want to protect their own money and bank their own exposure. The role of government is to maintain the integrity of and confidence in the whole system. With electronic cash, just as with paper cash today, it will be the responsibility of government to protect against systemic risk. This serious role cannot leave to the micro-economic interests of commercial organizations. The security of information may be one of the biggest concerns to the Internet users. For electronic banking users who most likely connect to the Internet via dial-up modem, faced with a smaller risk of someone breaking into their computers. Only organizations such as banks with dedicated Internet connections face the risk of someone from the Internet gaining unauthorized access to their computer or network. Moreover, the electronic banking system users also concern about non-reputability, which requires a reliable identification of both the sender and the receiver of on-line transactions. Non-secure electronic transaction can altered to change the apparent sender. Therefore, it is

extremely important to build in non-reputability, which means that the identity of both the sender and the receiver can be attested to by a trusted third party who holds the identity certificates (Yang, 1997).

2.2 Empirical studies related with Electronic banking adoption

The empirical literatures related to the Adoption of electronic banking written by different authors presented under here.

The study conducted by Mohammed, (2014) on the Ethiopian Banker's Perception of Electronic Banking indicates that traditionally banks are in the forefront in harnessing and using technology to improve their products and services. Over a period, they have been using electronic and telecommunication networks extensively to provide products and services to the customers. The study attempts to understand and identify bankers' perception of benefits and risks associated with electronic banking facilities in Ethiopia. Bank employees were the primary source of data and the data so collected was analyzed using mean score analysis. As per the findings of the study it is observed that bankers perceive a means to save time and minimize inconveniences as the most and the least advantage of electronic banking whereas Need for expertise and training and charge a high cost for services are considered as the most and the least risk associated with electronic banking.

The study conducted by Ayana, (2014) on identifying factors that affect adoption of E-banking in the Ethiopian banking industry. The study conducted based on the data gathered from four banks in Ethiopia. A mixed research approach used to answer the research questions that emerge through the review of existing literature and the experiences of the researcher in respect of the E-banking system in Ethiopia. The study statistically analyzes data obtained from the survey questionnaire. A research framework developed based on technology-organization environment model (TOE). The result of the study indicated that, the major barriers Ethiopian banking industry faces in the adoption of Electronic banking are security risk, lack of trust, lack of legal and regulatory framework, Lack of ICT infrastructure and absence of competition between local and foreign banks. The study suggests a series of measures, which could be taken by the banking industry and by government to address various challenges identified. These measures

include establishing a clear set of legal framework on the use of technology in banking industry, supporting banking industry by investing on ICT infrastructure and banks needs to focused on technological innovation competition rather than traditional bases of retail bank competition.

The study conducted by Gardachew, (2010) on the opportunities and challenges of Electronic Banking in Ethiopia. The aim of his study focuses on analyzing the status of electronic banking in Ethiopia and investigates the main challenges and opportunities of implementing Electronic Banking system. The author were conducted a survey on the existing operating style of banks and identifies some challenges of using Electronic Banking system, such as, lack of suitable legal and regulatory frame works for E-commerce and E- payments, political instability in neighboring countries, high rates of illiteracy and absence of financial networks that links different banks. According to Gardachew (2010), Opportunities offered by ICT through e-learning programs and Commitment of the governments on development of ICT infrastructures is considered as drivers of using E-commerce and E-payment systems.

The study conducted by Wondwossen and Tsegai, (2005) on the challenges and opportunities of E-payments in Ethiopia; their objective was studying of E-payment practices in developing countries, Africa and Ethiopia. The authors employs interview and on site observation to investigate challenges to E-payment in Ethiopia and found that, the main obstacles to the development of E-payments are, lack of customers trust in the initiatives, Unavailability of payment laws and regulations particularly for E-payment, Lack of skilled manpower and Frequent power disruption. According to Wondwossen and Tsegai (2005), an adequate legal structure and security framework could foster the use of E-payments.

The study conducted by Shamsul and Bilal, (n.d) on the impact of demographic factors in adoption of E-banking. The electronic banking is a progressive technology in India but its endorsement is very low and banks are investing huge amount of money to increase the diffusion of electronic banking .therefore, the study objects to know the real causes of its low penetration. In the paper an attempt has been made to know the objections, which are facing by banks and to find out the impact population vital statistics like Education, age,

occupation and income. How they are influencing the adoption of Electronic banking in India. To find out the impact of all these variables a structured questionnaire has been prepared a through a systematic survey which was conducted at the NCR. The number of respondents were 300 belongs to heterogeneous population .The Chi-Square test was used to interpret the hypothesis and the result illustrates that the age and gender of the respondents were doesn't have a significant impact while the income and educational level of individuals has a positive relationship with the adaption of electronic banking.

The study conducted by Ernest, et.al, (2012) on the Impact of Demographic Variables on Consumers' Adoption of E-banking in Nigeria it stated while a vast number of studies have pointed out the keys to the adoption and usage of e-banking, little attention have been paid to the demographic factors influencing the adoption of this unprecedented innovation. This aside, over the years, conclusive results are yet to be achieved in respect of the demographic variables influencing the adoption of e banking, especially within African context. Following from these observations, the researchers used a sample of 150 respondents conveniently drawn from the eight commercial banks operating in the study area. To examine the impact of six demographic variables, namely gender, marital status, religion, income, age and education level on the adoption of E-banking in Nigeria. In addition, the Results show that while the influence of marital status, age and education level on the adoption of E-banking is significant, the reverse is the case with such demographic variables as gender, religion and income.

The study conducted by Wadie, (2011) on the Factors Influencing the Adoption of Internet Banking in Tunisia with the purpose to determine those factors that influence the adoption of internet banking services in Tunisia. A theoretical model is if conceptualizes and links different factors influencing the adoption of internet banking. 253 respondents in Tunisia were sampled for responding: 95 were internet bank users, 158 were internet bank non-users. Factor analyses and regression technique employed to study the relationship. The results of the model tested clearly that use of internet banking in Tunisia was influence most strongly by convenience, risk, security and prior internet knowledge. Only information on online banking did not affect intention to use internet-banking

service in Tunisia. The results also propose that demographic factors influence significantly internet-banking behavior, specifically, occupation and instruction..

The study conducted by Sonja and Robert, (2011) on the Factors influencing online banking adoption states many bank customers are still reluctant to conduct their financial transactions online. The aim of the paper is to provide an improved understanding of determinants of online banking adoption in Austria. The authors propose a conceptual model that integrates perceptions of innovation characteristics and individual differences and report an empirical study with 372 bank customers in Austria. Logistic regression used to analyze the data. The findings confirm the relevance of perceived innovation characteristics to online banking acceptance. Beyond that, the results suggest that internet trust and preference for personal contact are individual difference variables that predict online banking adoption.

The study conducted by Mohamed, (2012) on the Factors Influencing the Adoption of E-banking with the aims to determine e-banking usage level among retail banking clients' and to identify the factors that influence the adoption of E-banking in Sudan. The study results indicate that the majority of retail banking industry clients uses at least one of the e-banking services. Among all e-banking channels, Automated Teller Machine (ATM) is the most popular channel. The results show that high-income clients and those who have current account and computer and internet literate are more likely to use e- banking services. However, the results show that there are no enough evidence of significant associations between e-banking usage with gender, marital status, education, and occupation.

The study conducted by Mutengezanwa and and Mauchi, (2013) on Socio-demographic factors influencing adoption of internet banking in Zimbabwe The paper reports on the findings of a research that was conducted in Harare. The study was triggered by the fact that most banks had introduced internet banking for the benefit of both the customers and the bank but adoption of the technology had remained low. It is worth noting that the adoption of internet banking and other technologies is paramount for sustainable economic growth and development of an economy. Whilst earlier researches established factors that influence internet adoption such as ease of use, security concerns, resistance

to change and accessibility among others, there was need to factor in the effects of demographics in the study. The research hypothesized that there was a relationship between internet banking adoption and educational level, occupation, age and income. Data collected from 335 commercial bank customers using questionnaires. Data was analysed using Chi square tests generated from SPSS version 12 and Microsoft excel. Findings of the research supported the hypotheses, supporting the view that indeed age, occupation, income, gender and educational level had positive relationships with internet banking adoption. The study recommended bankers to tailor make their marketing efforts towards the middle aged, high-income earners, the educated and the employed.

The study by Byoung, et.al, (n.d) to investigate determinants of Internet banking adoption based on an individual's benefits and costs of adopting Internet banking. Using data from the 2001 Survey of Consumer Finances, the paper estimates an adoption model for Internet banking. The findings show that consumers' ability, attitude and opportunity cost of time play a significant role on the decision of adopting Internet banking. Younger and well-educated consumers are more likely to adopt Internet banking. However, when individual's age associated with the level of education, the age effect varies across education groups. Among people with a low educational background, the effect of age on the probability of adopting Internet banking is hump-shaped. However, among people with a higher educational background, the probability of using Internet banking decreases with age. The study also investigates differences across households that use checks, ATM or debit card, direct payment and Internet banking as the payment methods. The findings show that there are significant differences in terms of the demographics of these households that use different payment methods.

On the other, hand the study conducted by Daghfous and Toufaily, (2007) on the success and critical factors in adoption of Electronic Banking by Lebanese banks. The research conducted on the factors that can lead to success the adoption of Electronic Banking and the other factors that can constitute as barrier to its adoption. it focus on the organizational, structural and strategic factors which can accelerate or, on the contrary, slow the adoption of this electronic mode of distribution and communication by the

banks, through analyzing the case of the Lebanese market. In order to test the validity of the theoretical framework, structured survey was used, interview questionnaire that was given to electronic banking managers or to information technology managers of all the banks on the official list of institutions operating on the Lebanese market. with a total of 57 banks, 31 of them operate internationally and 26 are strictly local were used to gather data. The results of their study shows that the organizational variables (bank size, functional divisions, technical staff, technical infrastructure, perceived risks, decision maker's international experience and mastery of innovation) are variables which exert significant impact on the adoption of Electronic Banking. among the structural characteristics, the result revealed that internal technological environment of the bank is a very important factor in determining the adoption of Electronic Banking, also the result shows that banks which are developing in the international scale are more likely to adopt Electronic Banking innovations. Finally the result of the study indicated that extent of penetration of Electronic Banking in the growth phase of an emerging market has an important correlation with the improvement of commercial performance.

The other descriptive case study analysis conducted by Khalfan, et al, (2006) on factors influencing the adoption of internet banking in Oman, aimed to identify the main potential factors or impediments that are currently inhibiting the incorporation or adoption of E-commerce applications in the Omani Banking sector. Data, used in their study were collected using semi structured interviews and survey questionnaire as well as reviewing some bank documents. The results of their study provide a Pragmatic picture about the adoption of E-Commerce applications in the core financial sector domain of Oman. One of the main findings is that security and data confidentiality issues have been a major barrier. The banking sector was reluctant to use E-commerce applications as they felt that transactions conducted electronically were open to hackers and viruses, which are beyond their control. Lack of top management support is the other inhibiting factor in the adoption of electronic commerce applications as per their finding. Similarly the study of Ghazi and Khalid (2012), found that, the most important barriers for E-business growth are technological issues, such as, security risk, quality of internet and cost of implementation to be the most prominent.

The study of Shah, et al, (2005) on critical success factors (CSF) in Electronic Banking conducted in United Kingdom, aims to determine the critical issues related to financial sector organizations when they establish businesses online. The survey method was used by researchers, which target the financial sector in the UK. The study indicates that Understanding the CSFs in Electronic Banking is important for senior management of banking related organizations, because it would potentially help them improve their strategic planning process. The analysis of the study indicates two major types of statistical analyses were conducted, descriptive statistical analyses and factor analysis. In descriptive analyses, the factors (or variables) ranked in order of their mean score, the highest score being the most important and so on. The top six factors in order of importance were user-friendly website, systems security, support from top management, fast responsive customer service, promotion of electronic commerce within organization, and all time availability of services and rapid delivery of services.

Polatoglu and Ekin, (2001) conducted a research on an empirical investigation of Turkish consumer acceptance of internet banking and mention reliability as the prime factor in their finding for the adoption of new technological innovations, reliability consists of security and privacy in Internet Banking transactions. They go to state that risks (security concern) include financial, physical or social risks associated when trying an innovation. They say that security risk is known to be as one of the major barriers in online banking adoption. Zhao, et.al, (2010) in their study of adoption of internet banking service in china says trust in a bank is the fundamental because it deals with customers financial activities. Trust is not only important to reduce risk in Internet Banking in general but also it helps banks to build trust to be more competitive in the industry.

Gerard, et al, (2006) in their study in Singapore identifies risk to be an important factor for Internet Banking adoption. All respondents who did not use Internet Banking services had a negative perception of the security in Internet Banking. The respondents perceived that there were many security risks when using the internet. They felt the privacy was a concern, feeling all their financial information could be in jeopardy. Risk was one of the two most frequently mentioned factors in their study; all respondents mentioned Concern about risk. An empirical investigation conducted by Sathye (1999) on the adoption of

Internet Banking by Australian consumers also identified, security concerns as key factor in internet banking adoption. A report on Internet Banking in Australia finds that, security concerns among banks and customers are keeping both away from Internet Banking Sathye, (1999). According to Sathye ,(1999), Security was identify as the biggest obstacle in adoption; it was found that 78 percent of personal and 73 percent of business respondents had security concerns when it comes to the use of Internet Banking. Thus, pointing out that personal users have more security concerns than business users. Sathye, (1999) further state that, a survey conducted by Thorton Consulting, (1996) in USA concluded that 67 percent of banks in the USA felt that security is a key anxiety in Internet Banking adoption. Banks tend to promote their security features in their services using technical terminology. This makes it difficult for normal customers to comprehend and resulting to a squander in the whole promotion.

Similarly the study of Yang, (1997) on the, security of electronic banking aimed to identify the challenges that oppose electronic banking which are the concerns of security and privacy of information. The study suggests that solutions to the security issues require the use of software-based systems or hardware-based systems or a hybrid of the two. These software-based solutions involve the use of encryption algorithms, private and public keys, and digital signatures to form software packets known as Secure Electronic Transaction used by MasterCard and Pretty Good Privacy. Hardware-based solutions such as the Smartcard and the Me Chip provide better protection for the confidentiality of personal information. Software-based solutions have the advantage over hardware-based solutions in that they are easy to distribute and are generally less expensive. In Laukkanen, (2008) research, risk considered as the most intense barrier and the greatest concern in the adoption of Internet Banking. However, in this study consumers feel human errors by themselves could cause a threat to their financial services. For example, losing their Personal identification number (PIN) codes and it may get it to the wrong hands and result in crime or theft. A higher determinant of resistance appears to be the risk related to the individual's perceived ability to use the innovation successfully, i.e. self-efficacy Laukkanen, (2008). Sathye, (1999) suggests that banks use positive publicity to its customers to help ease the response from customer on security. One of the major banks in Australia has taken responsibility in undertaking losses for any

unauthorised use, with exception of certain circumstances. However, in an empirical investigation in Turkey by Polatoglu and Ekin, (2001) states that Internet Banking services introduced by large, well-known and trusted banks, because customer perceived security risk in these banks is assumed to be decreasing significantly. On the other hand the risk factor is a barrier to corporate customers of banks as well. Balachandher, et al, (2010) have completed a study on the barriers to internet usage on a corporate customer perspective and found that lack of trust on security issue is the main barrier. The study shows that corporate customers only use Internet Banking to a certain extent and feel banks should invest more on security infrastructure and banks should be willing to take full responsibility. These results are similar to the findings of different studies. For example in the study of Booz, et.al, (1997), security concern was the top ranked factor for users not adopting Internet Banking in Latin America.

Ram and Sheth, (1989) argue that functional barriers and psychological barriers cause consumer resistance to the innovation. Functional barriers can divide into three: the usage barrier, the value barrier and the risk barrier, where as psychological barriers can divide into tradition barrier and image barrier. According to Ram and Sheth (1989), functional barriers arise when consumers perceive changes would take place when adopting innovation and the psychological barriers are caused by consumer's beliefs. On the other hand, Khanfar, et.al (2006) conducted study on the customer satisfaction with internet banking web site in the Arab Bank. The study identified some factors, which can determine customer's satisfaction in the use of internet banking service. Such as customer supports, security, ease of use, digital products/services, transaction and payment, information content, and innovation. Researchers employ a survey questionnaire to gather data and their results showed that there is a narrow-based satisfaction with internet banking in all factors through a multi-regression; the researchers found out that all factors have an impact on the customer satisfaction, and they have found that the relation was positive.

A research conducted by D'Souza, (2002) on the comparative performance of public and private sector banks in the decade of the 1990s shows that though the turnover ratio rose in public sector banks (PSBs), the turnover per employee in private and foreign banks

doubled relative to the ratio for PSBs. In addition, this is not due to the presence of a large rural and semi-urban concentration of bank branches amongst PSBs but rather due to technological up gradation in the private and foreign banks. Private and foreign banks have changed the structure of their employment towards a higher skilled workforce by increasing the recruitment of officers and reducing clerical and subordinate staff. The combination of higher technology and higher skills have posted a higher turnover for these banks as they have been able to provide better customer support and have managed their assets well.

The study of Aghdassi, et.al, (2007) on Association between strategic values and Electronic Banking adoption in Iranian banks attempts to understand strategic value of Electronic Banking for Iranian banks and examine the causal effect of perceiving Electronic Banking as a value and its adoption. The researchers propose an Electronic Banking adoption model that is identifying five factors that have found to be influential in the perception of strategic value of IT: performance support, operational support, managerial productivity, and strategic decision aids. They also identified eight factors that influence electronic banking adoption: organizational readiness, Infrastructural readiness, external dependency, Intangible pressure, persuasive pressure, perceived ease of use, and perceived usefulness. Data collected via a questionnaire-based survey from Decision maker unit of Iranian Banks. In order to test the model, a statistical analysis conducted in two stages. The first step employed factor analysis to measure whether the number of factors and loadings of items involved in the two main constructs (perceived strategic value and adoption) conform to the proposed model, canonical analysis utilized in the second step in order to explore how the perceptions of strategic value influence the decision to adopt E-commerce. The finding of their study indicated, that in a developing country like Iran and a big industry like banking, although the items of the adoption factors model are applied, the story is a bit different. In Iran the E-commerce adoption, specifically Electronic Banking adoption is in its beginning stages and still there are many gaps. These gaps could be technological, economical, socio-cultural, geopolitical and other gaps. In addition, the result of their study expressed, that bank managers' perception through E-commerce is very positive and effective in their adoption trend.

The other study reviewed was the study of Kassim (2005) focused on Electronic Banking service quality: gaps in the Qatari banking industry investigate the discrepancy between customer's expectation and perception towards the Electronic Banking services in Qatar. A questionnaire distributed to 100 retail-banking customers in Doha. Out of 100 questionnaires, only 62 were useable. A cross-sectional survey design was adopted which questioned respondents on Electronic Banking services. The findings of the study showed that there were some differences in magnitude of gap score among the five items of the Electronic Banking services: Internet/Telephone/SMS, personnel assistance, instructions, ATM machines and functionality of the ATM machines. The result also showed that one item of Electronic Banking services had positive gap score, that is, the quality of the Internet/Telephone/SMS banking services. All the other four items indicated that the quality of service fell short of the customer's expectation; customers were generally not satisfied with the service providers. Nevertheless, each item of quality of the Electronic Banking services showed differences with respect to the size and gap score. On the other hand the study of Leelapongprasut, et.al, (2005) on a Quality Study of Internet Banking in Thailand aimed to study a level of Internet Banking services quality in Thailand and compare the overall services quality of Internet Banking and factor of Internet Banking service between each bank and each dimension of quality by David A. Garvin. The research tools used in this study were questionnaires in the Web page form.

The study of Kerem, (2003) on the adoption of electronic banking: underlying consumer behavior and critical success factors conducted in Estonia, was intended to study the further understanding of, how consumers perceive electronic banking in the heyday of interactive channels in Estonia, as Estonia is internationally renowned for being a pioneer in the acceptance of new technologies. A series of an in depth interviews was conducted with leading industry experts in Estonia. The selection criterion for the respondent was mainly their involvement with the development of Internet banking systems from the early days of its emergence. The survey conducted for this research addressed six different issues influencing the adoption of Internet banking (Better prices, Recommendations, Better service, Marketing efforts, Better access and higher privacy). The most important factors in starting to use Internet banking are first better access to the services (convenience), better prices and higher privacy. Better service (i.e. preferring

self-service to office service) was also of above the average importance. Two factors that the respondents did not consider relevant to their adoption decision were banks' marketing activities and personal recommendations from friends and colleagues. In addition, the survey conducted six main obstacles (computers are difficult, no access to internet, internet banking is expensive, low security, have had no chance to try and I prefer personal contact) in adopting Internet banking. results of a preliminary study, 100 respondents), the most important factors discouraging the use of internet banking are lack of Internet access and not having a chance to try out Internet banking in a safe environment. Finally, the research indicates that banking activities alone may not be sufficient in achieving growth if general infrastructure, economic environment and government initiatives are not supportive. The research conducted on identifying the attitudinal, social and perceived behavioral control factors that might influence the adoption of Internet banking by Hoppe, et.al, (2001) were based on theory of planned behavior (TPB) and the diffusion of innovations theory (DIT) developed by a previous research in Singapore. The aim of the study was to collect South African data in order to test out the hypotheses regarding the factors, which affect adoption of Internet banking and compare these results with those collected in other countries. Online questionnaire was used to collect empirical data and the results of the study shows that intention to adopt Internet banking can be predicted by attitudinal factors, perceived behavioral control factors to a lesser degree, and not by subjective norms. All attitudinal factors except banking needs are found to be significant, with complexity and risk showing a negative relationship.

In general, Review of Empirical studies shows that understanding the factors that affects Electronic Banking is important for banking industries because it would potentially help them improve their strategic planning process. In addition, the literature review indicates that according to the customers there are different factors that influencing the adoption of electronic banking. In this study, researcher will identified the factors that affect electronic banking in Ethiopian by using survey.

CHAPTER THREE: RESEARCH METHODOLOGY

1. 3.1 Research Design

According to Ahmed (2011) the research purpose were identified and selected depending on the problem area and the nature of the phenomenon that it studies and he stated the purpose of the research could be exploratory which deals with unknown problem, descriptive in which there is an awareness of the problem and explanatory, where the problem is clearly defined.

Based on the above research purpose the purpose of this thesis were conduct an explanatory and descriptive research in order to determine the factors that affects the success and faller of the activity of electronic banking in Ethiopia banking sector by taking the determinants that are already identified by different scholars related to electronic banking. Therefore, the explanatory research was used.

On the other hand this research were focused on describing the current situation of the problem and to highlight the most important factors that can negatively or positively affect adoption of electronic banking in Ethiopia. Moreover, this research aims to explain the phenomenon and assess the current situation of electronic banking. Therefore, descriptive research was used to fulfill this approach.

3.2 Research Approach

In order to achieve the research objective selecting an appropriate research approach were one of the most important parts of the design of the research methodology to get good analysis result. According to Creswell (2003), there are three basic types of research approaches, quantitative, qualitative, and mixed approach.

In order to achieve the objective of this study and answer the research questions researcher were adopt mixed research approach to examine the determinants of electronic banking in Ethiopia to converge across qualitative and quantitative methods. Employing this approach is used to neutralize or cancel the biases of applying any of a single approach and a means to offset the weaknesses inherent in a single method with the strengths of the other method (Creswell 2003). Mixed research approach opens door to multiple methods of data collection and helps to generate the findings to a population and

develop a detailed view of the meaning of a phenomenon or concept for individuals (Creswell, 2003).

Mixed methods approach can be implemented in different ways. The literature identifies three strategies in integrating the two approaches, i.e. quantitative and qualitative methods (Creswell, 2003). First, concurrent, in which the quantitative and qualitative phases occur simultaneously. Second, sequential, in which the researcher starts with gathering qualitative data and then gathers quantitative data or vice versa in two different phases. And third, transformative where the researcher (either concurrently or sequentially) may be able to give voice to diverse perspectives, to better advocate for participants or to better understand a phenomenon or process that is changing as a result of being studied.

In this study, concurrent procedure was used to triangulate quantitative and qualitative data to provide a comprehensive analysis of the research problem. Moreover, researcher was collected both forms of data at the same time during the study and integrates the information in the interpretation of the overall results (Creswell, 2003).

3.3 Research Strategy

The most important condition for differentiating among the various research strategies is to identify the type of research question being asked (Creswell, 2003). It is possible to identify some situations in which all research strategies might be relevant and other situations in which two strategies might be considered equally attractive. We can also use more than one strategy in any given study. To this extent, the various strategies are not mutually exclusive. However, we can also identify some situations in which a specific strategy has a distinct advantage (Yin, 1989). According to Yin, there are five strategies to collect data and get results: experiment, survey, archival analysis, history and case study. In this study, Survey approach was chosen, because this research does not require control over behavioral events but it focuses on current issues.

This research paper was intended to examine the factors that affect the adoption of electronic banking in Ethiopia. To undertake this research, the specific methods of data collection used were survey. Survey for the quantitative strategy was used through distributing self-administered questionnaires. Questionnaires were distributed to sampled

customer of commercial banks of Ethiopia from different groups. Those respondents were selected because, the aim of the study were to identify the factors that affects the adoption of electronic banking from the side of the customers of the banking service in Ethiopia.

Since the research questions mainly focus on what questions it is justifiable rationale for conducting an exploratory study and more likely to favor survey than others (Yin, 1989). Survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. Its purpose is to generalize from a sample to a population so that inferences can be made and it is also economical and rapid turnaround in data collection (Creswell, 2003) and this method is important for collecting large amounts of raw data using question and answer formats (Hair et al. 2006). Survey had conducted via self-administered questionnaire from the sampled bank customers because questionnaire is a commonplace instrument for observing data beyond the physical reach of the observer (Leedy, 1989). The main advantage of survey is its ability to accommodate large sample sizes at relatively low costs, ease of administration and ability to tap in to factors that are not directly observable (Hair et al., 2006).

The questionnaire was dividing into three sections. Section I captured basic demographic information of the respondents such as age and educational background and, Section II captured General information about the respondents and the last section covers the question that measures the attitudes of respondents in relation to the adoption of electronic banking services.

3.4 Population, Sampling techniques and sample size determination

Sampling is the process of choosing, from a much large population, a group about which wish to make generalized statements so that the selected part represent the total group (Leedy, 1989). The customers of the commercial bank of Ethiopia was taken as population, and Stratified Random Sampling were used for the sampling of the customers from the population by grouping the respondents in different Groups. Group one were Consists of Customers with higher educational level that were be taken from the teaching staff of jimma university. the second group is consists of the customers from higher

income level that was taken from the category A tax payers, and the last group is consists the customer of the bank with lower income and lower level of education that was taken from lower level workers in jimma university.

Unlike other sampling techniques, stratified sampling method has the following advantage, which leads the researcher to use it. First, it improves the accuracy of the sample, i.e. it ensures that any differences between the strata controlled by making sure that each stratum is proportionately represented. Second, Stratified sampling is one tool to reduce selection bias. However, if from stratum's one group is either overrepresented or underrepresented in a sample, selection bias has occurred and the sample were not accurately reflect the larger population. Moreover, simple random sampling method is used for the following advantages. First, the method gives equal chance for all stratum in the study to be included in the sample. Second, it minimizes the existence of sampling biases, and third, the method itself is too easy to use. Based on this from the total population of 506,723 customers of commercial bank of Ethiopia jimma district 384 customers are selected as sample based on the following systematic scientific formula and distributed to each stratum using the ratio of each stratum population to the total population of the strata.

$$N_0 = \frac{(z)^2 * (p)(q)}{(d)^2}$$

Where,

N_0 = Sample size

z = value for selected alpha level of .025 in each tail (for 95% level of confidence)

= 1.96.

$(p)(q)$ = estimate of variance = (0.5) (0.5)

d = acceptable margin of error for proportion being estimated 5% = .05

Source: Cochrans (1977)

Based on the above formula the following result was occurred:-

$$N_0 = \frac{(1.96)^2 (0.5) (0.5)}{(.05)^2} = 384$$

$$(0.05)^2$$

Table 1: Sample size determination for each stratum

| S/ N | Group Assignment | Source of Population | N | Ratio | n |
|--------------|---------------------------------------|--|-------|-------------------|-----|
| 1 | Higher Educational Level | Jimma University Teaching Staff | 1,476 | $(1476/3485)*384$ | 162 |
| 2 | Higher Income level | Jimma Twon Business owners of Category A tax payers | 525 | $(525/3485)*384$ | 58 |
| 3 | Lower Educational and income Level | Jimma University lower level workers | 1484 | $(1484/3485)*384$ | 164 |
| Total Sample | | | 3,485 | | 384 |

Source: Jimma university human resource and Jimma Town Revenue office, 2015

3.5 Method of Data Collection

In order to collect sufficient data that can answer the research questions, researcher designed surveys questionnaire to get quantified results.

3.6 Study Variables

Variables are defined operationally and are commonly divided into Independent variables (active or attribute), and dependent variables is the variable supposed to react to the independent variable and it depends on the independent variable and in the study the adoption of electronic banking were selected as dependent variable. An independent variable is a variable that causes a change or presumed were cause a change to other dependent variable and explicate the dependent variable .For the purpose of this study the researcher has included five independent variables namely Computer experience, age, educational level, income level and fear of security. By considering, they explained more about the adoption of electronic banking of customers.

3.7 Method of Data Analysis, Interpretation and Discussion

Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence, to address the initial proposition of a study (Yin, 1989). The researcher was Plan to analyze the data collected through survey to statistical population concerning the Electronic Banking system. The data collected via questionnaires were analyzes with statistical package for social scientists (SPSS 20). Furthermore, Creswell, 2003, suggested that qualitative research is fundamentally interpretative i.e. the researcher makes an interpretation of the data. Thus, the data that was collected from the questioners were interpreted qualitatively and the result of the study was discussed using tables and graphs. The logistic regression analysis was used to determine the adaption of electronic banking in Ethiopia.

CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

4.1 Introduction

As it is indicated in the methodology part of this study, data collected from three stratum namely Jimma University teaching staffs, Jimma university Lower level staffs and category A tax payers in Jimma town by distributing questionnaires. 384 questionnaires were distributed based on the ratio to the total population of the strata to each of the stratum. Out of the total 384 questionnaires, 348 Useable questionnaires were obtained (90.63 response rates). In order to analyze the research results, Statistical Package for the Social Sciences version 20 (SPSS 20) software is used and the data was analysed in two Sections. The first section deals with the descriptive analysis of the data collected through questionnaires using the descriptive statistics section of the SPSS 20 and the second section deals with the Regression result of the variables using the binary logistic regression section of the SPSS.

4.2 Descriptive Analysis

In this section, the data collected from 348 respondents were analysed using the SPSS section of descriptive statistics by dividing in to five parts. The first part analyzes the demographic profile of the respondents that have the detail explanation of the gender, age, educational level and income level of respondents. The next part deals with the relationship of demographic profile of the respondents with the adoption of electronic banking that shows the adapter and non adapters of electronic banking in respect to the gender, age, educational level and income level of respondents. The third part analyze the general information of the respondents that is consists of the information of respondents on the computer experience, adoption of electronic banking, forms and frequency of electronic banking utilization and fear of security related to the adoption of electronic banking. In the fourth part the relationship between general information of respondents with the adoption of electronic banking were checked and the last part analyses the attitude of respondents towards the adoption of electronic banking by analyzing the different questions asked using the form of likert-scale .

4.2.1 Demographic Profile of respondents

Table 2 shows the demographic characteristics of the respondents that include gender, age, educational level and monthly income of the respondents. The highest percentage of participant's gender in this study was males that were out of 348 respondents 67% of the respondents are male and only 33% of the respondents were female. From this the researcher observed that the highest number of bank customers were male.

In the case of classification of respondents by age the highest percentage was 20-30 years old, that was 35.3% of the respondents, followed by 31-40 years old, that was 34.5% of the respondents, and the next far followers of 41-50, 51-60 and above 60 years old with 19.8%, 8.6% and 1.7% of the respondents respectively. From this result the researcher conclude that the highest number of bank customers were between age of 20 to 40 years that indicate youngest age group, that consists about 69.8%(35.3%+34.5%) of the respondents.

Regarding the educational level of the study participants, the highest percentage of them has holders of Masters Degree that was 28.70% and followed by high school completed, high school not completed, elementary or not educated, bachelor degree, and diploma and PhD holders with 21.3%, 19.80%, 13.5%, 13.2%, 2.6% and 0.9% of the respondents respectively. From the result it is clearly observed that the highest percentage of the respondents were the holders of masters degree. which is 28.7% of the respondents but the researcher doesn't conclude that the highest number of bank customers are masters degree holders because educational level is one of the stratum that the respondent were grouped to identify the income level has an effect on the adoption of electronic banking or not. Hence, educational level is the criteria to select the respondents and it does not indicate the view of the total customers of the bank regarding of their educational level.

On the other hand, the highest percentage of participants monthly income ranges on below 2,000 ETB that was 39.9% of the respondents followed by above 10,000 ETB, 5,000-10,000 ETB and 2,000 to 5,000 ETB with 27.9%, 22.1% and 10.1% of the respondents respectively. From the result it is clearly observed that the highest percentage of the income of the respondents were below 2,000 ETB. But, the researcher does not conclude that the highest number of bank customers income were blow 2,000 ETB

because income level is one of the stratum that the respondent were grouped to identify the income level has an effect on the adoption of electronic banking or not. Hence, income level is the criteria to select the respondents and it does not indicate the view of the total customers of the bank regarding of their income level.

Table 2: Demographic profile of respondents

| Demographic | | Frequency | Percent |
|-------------------|-----------------------------|-----------|---------|
| Gender | Male | 233 | 67 |
| | Female | 115 | 33 |
| Age | 20-30 | 123 | 35.3 |
| | 31-40 | 120 | 34.5 |
| | 41-50 | 69 | 19.8 |
| | 51-60 | 30 | 8.6 |
| | above 60 | 6 | 1.7 |
| Educational Level | Elementary or not educated | 47 | 13.5 |
| | High school not completed | 69 | 19.8 |
| | High school completed | 74 | 21.3 |
| | Diploma(LVEL I,II,II or IV) | 9 | 2.6 |
| | Bachelor Degree | 46 | 13.2 |
| | Master Degree | 100 | 28.7 |
| | PHD or Assistant Professor | 3 | 0.9 |
| Monthly Income | Below 2,000 ETB | 139 | 39.9 |
| | 2,000 to 5,000 ETB | 35 | 10.1 |
| | 5,000-10,000 ETB | 77 | 22.1 |
| | above 10,000 ETB | 97 | 27.9 |

Source: Survey Questionnaire, 2015

4.2.2 The Relation of demographic profile with adoption of electronic banking

Table 3 show that from total of 233 male respondents 60.10% of them adapt electronic banking that constitute 71.1% to the total adaptors while from 115 female respondents only 49.60% of them were adapt electronic banking service that constitutes only 28.90% of the total adaptors . From this, the researcher observed that from the total adaptors the male respondents constitutes the highest percentage that is very far from the Female adaptors. However, the researcher does not conclude that the gender difference have an effect on the adoption of electronic banking. Because the researcher see that the

percentage of male respondents that are not adapt also far higher than that of female respondents which is 61.6% and 38.4% respectively and the ratios of the adaptors and non adaptors doesn't have that much difference within the gender to take as a factor that affects the adoption of electronic banking.

Table 3: Relation of Gender with adoption of E-Banking

| | | | Adoption of Electronic Banking | | Total |
|--------|--------|--------------------------------|--------------------------------|---------|---------|
| | | | Not adapted | Adapted | |
| GENDER | Male | Count | 93 | 140 | 233 |
| | | % within GENDER | 39.90% | 60.10% | 100.00% |
| | | % within Adoption of E-Banking | 61.60% | 71.10% | 67.00% |
| | Female | Count | 58 | 57 | 115 |
| | | % within GENDER | 50.40% | 49.60% | 100.00% |
| | | % within Adoption of E-Banking | 38.40% | 28.90% | 33.00% |

Source: Survey Questionnaire, 2015

The next demographic profile of respondents in the table 4 with the adoption of electronic banking is age with different category. It shows that the highest percentage that adopts electronic banking were shown in the elder age category, which is above 60 years of age and between 51-60 years of age with 66.7% and 63.3% of respondents but with minimal contribution to the total adaptors of electronic banking that is only 2% and 9.6%v respectively. While the other age group 20-30, 31-40 and 41-50 years of age shows 52.8%, 57.5% and 58% of the respondents in the age group were, adapt electronic banking with the contribution of 33%, 35% and 20.3% of the total adaptors respectively. From the result, the researcher observed that the adoption of electronic banking within different age group doesn't differ because the ratio of adaptor and non-adaptors for all groups doesn't have that much difference. Therefore, the result shows that age does not affect the adoption of electronic banking by customers.

Table 4: the relation of age with adoption of E - Banking

| | | | Adoption of Electronic Banking | | Total |
|-----|----------|--------------------------------|--------------------------------|---------|---------|
| | | | Not adapted | Adapted | |
| AGE | 20-30 | Count | 58 | 65 | 123 |
| | | % within AGE | 47.20% | 52.80% | 100.00% |
| | | % within Adoption of E-Banking | 38.40% | 33.00% | 35.30% |
| | 31-40 | Count | 51 | 69 | 120 |
| | | % within AGE | 42.50% | 57.50% | 100.00% |
| | | % within Adoption of E-Banking | 33.80% | 35.00% | 34.50% |
| | 41-50 | Count | 29 | 40 | 69 |
| | | % within AGE | 42.00% | 58.00% | 100.00% |
| | | % within Adoption of E-Banking | 19.20% | 20.30% | 19.80% |
| | 51-60 | Count | 11 | 19 | 30 |
| | | % within AGE | 36.70% | 63.30% | 100.00% |
| | | % within Adoption of E-Banking | 7.30% | 9.60% | 8.60% |
| | above 60 | Count | 2 | 4 | 6 |
| | | % within AGE | 33.30% | 66.70% | 100.00% |
| | | % within Adoption of E-Banking | 1.30% | 2.00% | 1.70% |

Source: Survey Questionnaire, 2015

The relation of other demographic profile of respondents is the educational level of the respondents. As shown in the table 5 the highest percentage of adapters of electronic banking within the educational level shown in the PhD, Masters Degree and Bachelor Degree holders with 100%, 95% and 89.10% of the respondents with contribution of 1.5%, 48.2% and 20.8% to the total adapters of electronic banking respectively. While the other groups of diploma holders, high school completed, high school not completed and elementary or not educated respondents were adapt electronic banking for 55.6%, 28.4%, 34.8% and 17% with the contribution of 2.5%, 10.7%, 12.2%, and 4.1% to the total adapters of electronic banking respectively. From the result the researcher observed that there is higher linkage between the educational level and adoption of electronic banking because the respondents with higher educational qualification that have bachelor

degree or higher adapt the system than the lower level educated customers. Therefore, the educational level of customers has an impact on the adoption of electronic banking.

Table 5: The relation of educational level with adoption of E-Banking

| | | | Adoption of Electronic Banking | | Total |
|----------------------------|---------------------------------|--------------------------------|--------------------------------|---------|---------|
| | | | Not adapted | Adapted | |
| Educational Level | Elementary or not educated | Count | 39 | 8 | 47 |
| | | % within Educational Level | 83.00% | 17.00% | 100.00% |
| | | % within Adoption of E-Banking | 25.80% | 4.10% | 13.50% |
| | High school not completed | Count | 45 | 24 | 69 |
| | | % within Educational Level | 65.20% | 34.80% | 100.00% |
| | | % within Adoption of E-Banking | 29.80% | 12.20% | 19.80% |
| | High school completed | Count | 53 | 21 | 74 |
| | | % within Educational Level | 71.60% | 28.40% | 100.00% |
| | | % within Adoption of E-Banking | 35.10% | 10.70% | 21.30% |
| | Diploma(LEVEL I, II, III or IV) | Count | 4 | 5 | 9 |
| | | % within Educational Level | 44.40% | 55.60% | 100.00% |
| | | % within Adoption of E-Banking | 2.60% | 2.50% | 2.60% |
| | Bachelor Degree | Count | 5 | 41 | 46 |
| | | % within Educational Level | 10.90% | 89.10% | 100.00% |
| | | % within Adoption of E-Banking | 3.30% | 20.80% | 13.20% |
| | Master Degree | Count | 5 | 95 | 100 |
| | | % within Educational Level | 5.00% | 95.00% | 100.00% |
| | | % within Adoption of E-Banking | 3.30% | 48.20% | 28.70% |
| PHD or Assistant Professor | Count | 0 | 3 | 3 | |
| | % within Educational Level | 0.00% | 100.00% | 100.00% | |
| | % within Adoption of E-Banking | 0.00% | 1.50% | 0.90% | |

Source: Survey Questionnaire, 2015

The last demographic profile is monthly income of the respondents. As it, shown in the table 6 the highest percentage of the respondents adapt electronic banking falls under the

respondents with monthly income between 5,000 to 10,000.00 ETB with adoption of 93.50% within the income group that contributed 36.5% to the total adaptors. And followed by income group between 2,000 to 5,000 ETB and above 10,000 ETB with 85.7% and 78.40% of the respondents within the income group with the contribution of 15.2% and 38.60% to the total adaptors respectively. While the rest income group that is below 2,000 ETB adapts electronic banking only for 13.7 within the income group and contributes 9.7% to the total adaptors. From the result, the researcher observed that there is a difference in adoption of electronic banking in different income groups because the customers with higher income needs to access their money at the time they wants to expend even out of the working hours of banks while the customers with lower income are more programmed to expend their money. Therefore, the income level of the respondents was affecting the adoption of electronic banking.

Table 6 : The Relation of Monthly income and adoption of E-Banking

| | | | Adoption of Electronic Banking | | Total |
|----------------|--------------------|---------------------------------|--------------------------------|---------|---------|
| | | | Not adapted | Adapted | |
| Monthly Income | Below 2,000 ETB | Count | 120 | 19 | 139 |
| | | % within Monthly Income | 86.30% | 13.70% | 100.00% |
| | | % within Adoption of E- Banking | 79.50% | 9.60% | 39.90% |
| | 2,000 to 5,000 ETB | Count | 5 | 30 | 35 |
| | | % within Monthly Income | 14.30% | 85.70% | 100.00% |
| | | % within Adoption of E- Banking | 3.30% | 15.20% | 10.10% |
| | 5,000-10,000 ETB | Count | 5 | 72 | 77 |
| | | % within Monthly Income | 6.50% | 93.50% | 100.00% |
| | | % within Adoption of E- Banking | 3.30% | 36.50% | 22.10% |
| | above 10,000 ETB | Count | 21 | 76 | 97 |
| | | % within Monthly Income | 21.60% | 78.40% | 100.00% |
| | | % within Adoption of E- Banking | 13.90% | 38.60% | 27.90% |

Source: Survey Questionnaire, 2015

4.2.3 The general information of respondents

Table 7: The general Information of respondents

| | | Frequency | Percent |
|--|-----------------------------|------------------|----------------|
| Computer experience | No | 134 | 38.5 |
| | Yes | 214 | 61.5 |
| Year of computer experience | Below one Year | 42 | 12.1 |
| | Above one Year | 172 | 49.4 |
| Missing | System | 134 | 38.5 |
| Adoption of Electronic Banking | Not adapted | 151 | 43.4 |
| | Adapted | 197 | 56.6 |
| Fear of Security | No | 168 | 48.3 |
| | Yes | 180 | 51.7 |
| Form of Electronic Banking used by adaptors of E-Banking | ATM | 197 | 100 |
| | POS | 72 | 36.5 |
| | Mobile banking | 57 | 28.9 |
| | Internet banking | 151 | 43.4 |
| | ATM | 197 | 56.6 |
| Frequency of Electronic banking Use | Frequently Used | 110 | 55.8 |
| | Some times | 67 | 34 |
| | Not used | 20 | 10.2 |
| Reason for not using Electronic Banking | I didn't have the knowledge | 4 | 20 |
| | Fear of Security | 12 | 60 |
| | Other Reason | 4 | 20 |

Source: Survey Questionnaire, 2015

Table 7 shows 61.5% of the respondents have an experience in using computer with 49.4% of the respondent have an experience of above one year while the rest 12.1% of respondent were below one year of experience, while the rest 38.5% did not have prior computer experience. When we see the ratio of electronic banking adaptors, the table shows that 56.6% of the respondents adapt electronic banking while the rest 43.4% did not. The table also indicates that all users of electronic banking uses automated teller machine(ATM) but while all users of ATM have the access to use Point of sale terminals

(POS) only 36.5% of the users use the terminal and only 28.9% of the users are use the mobile banking, while no one of the respondents use internet banking. The table also shows that from the users of electronic banking 55.8% uses in frequently manner, 34% uses sometimes or not frequently and the rest 10.20 didn't use their electronic banking account for the reason of lack of knowledge, fear of Security and other not specified reasons in the rate of 20%, 60% and 20% respectively.

4.2.4 Relationship of general Information of the respondents with Adoption of Electronic Banking

Table 8 indicates the relation of computer experience and year of computer experience with the adoption of electronic banking. the result of the table indicates from respondents that doesn't have an experience in computer only 21.6% adapt electronic banking and the rest 78.4% didn't. While from the respondents who have an experience of computer 78.5% of them were adapt and the rest 21.5% did not with the share of 14.7% and 85.3% by the respondents who does not have an experience of computer and the respondents who have computer experience respectively. Based on their year of experience 52.4% of respondents with less than one year experience doesn't adapt electronic banking and the rest 47.6% adapts the system, while from the respondents with above one year experience of computer only 14% were not adapt electronic banking and the highest percentage 86% adapts electronic banking. From the result the researcher observed that, there is a difference in adoption of electronic banking between the customers with the experience in computer and that didn't have an experience in computer. Therefore, the experience of computer has an effect on the adoption of electronic banking.

Table 8 : the relation of computer experience and Adoption of E-Banking

| | | | Adoption of Electronic Banking | | Total |
|-----------------------------|----------------|--------------------------------------|--------------------------------|---------|---------|
| | | | Not adapted | Adapted | |
| Computer experience | No | Count | 105 | 29 | 134 |
| | | % within Computer experience | 78.40% | 21.60% | 100.00% |
| | | % within Adoption of E-Banking | 69.50% | 14.70% | 38.50% |
| | Yes | Count | 46 | 168 | 214 |
| | | % within Computer experience | 21.50% | 78.50% | 100.00% |
| | | % within Adoption of E-Banking | 30.50% | 85.30% | 61.50% |
| Year of computer experience | Below one Year | Count | 22 | 20 | 42 |
| | | % within Year of computer experience | 52.40% | 47.60% | 100.00% |
| | | % within Adoption of E-Banking | 47.80% | 11.90% | 19.60% |
| | Above one Year | Count | 24 | 148 | 172 |
| | | % within Year of computer experience | 14.00% | 86.00% | 100.00% |
| | | % within Adoption of E-Banking | 52.20% | 88.10% | 80.40% |

Source: Survey Questionnaire, 2015

Table 9 shows the relation of the fear of security with the adoption of electronic banking. The table indicates from the respondent who says they didn't fear the security of electronic banking 81% was adapting electronic banking. while from the respondents who says they fear the security of electronic banking only 33.9% adapt electronic banking service and from the total adaptors of electronic banking 31% of them fear about the security of the system, while 78.8% of non adapters fear the security of electronic banking system. From the result, the researcher observed that there is a difference in fear of security between adaptors and non-adaptors. Therefore, the fear of security affects the adoption of electronic banking.

Table 9 : The relation of fear of security and adoption of E-Banking

| | | | Adoption of Electronic Banking | | Total |
|------------------|-----|--------------------------------|--------------------------------|---------|---------|
| | | | Not adapted | Adapted | |
| Fear of Security | No | Count | 32 | 136 | 168 |
| | | % within Fear of Security | 19.00% | 81.00% | 100.00% |
| | | % within Adoption of E-Banking | 21.20% | 69.00% | 48.30% |
| | Yes | Count | 119 | 61 | 180 |
| | | % within Fear of Security | 66.10% | 33.90% | 100.00% |
| | | % within Adoption of E-Banking | 78.80% | 31.00% | 51.70% |

Source: Survey Questionnaire, 2015

4.1.5 The attitude on the adoption of electronic banking by customers of banks

The attitude of the respondents in relation to the adoption of electronic banking that was collect by the form of likert-scale questions and the analysis were made by calculating the mode and median of the response of respondents using the descriptive analysis of the SPSS.

Table 10 shows that both the median and mode for the first two questions is 2.0 that indicated the highest percentage of the respondents were agreed on the implementation of electronic banking was good news for the customer of the bank and it makes life's easy in doing banking activities. While the mode and median of the third question shows that 3.0 that means majority of the respondents not sure that the commercial bank of Ethiopia gives the necessary information related to the adoption of electronic banking. Hence, the researcher observed that most of the respondents agreed on the benefit of the electronic banking but the information given to the customers about the related topic of electronic banking like the related risk, related benefits and other basic information is minimal.

Table 10 : The attitude of Respondents with the adoption of banking 1

| | The implementations of electronic banking have good news for customers of the bank. | Electronic banking makes life easy to do banking activities. | Commercial bank of Ethiopia gives enough information and guidance about the benefits, related risk, and other basic information's related to electronic banking. |
|-----------|---|--|--|
| Valid | 348 | 348 | 348 |
| N Missing | 0 | 0 | 0 |
| Median | 2 | 2 | 3 |
| Mode | 2 | 2 | 3 |

Source: Survey Questionnaire, 2015

Table 11 indicates that the median and mode for all question in the table was 2.0 that shows most of the respondents agreed that electronic banking enables the customer to complete banking service, it improves the customer service given by the bank and the accessibility of banks. Hence, the majority of the customers agreed on the benefits that the adoption of electronic banking gives to bank customers.

Table 11 : The attitude of Respondents with the adoption of banking 2

| | Electronic banking enables customers to complete banking activities more quickly than retail banking | Electronic banking improves customer service given by the bank. | Electronic banking improves accessibility of banks. |
|-----------|--|---|---|
| Valid | 348 | 348 | 348 |
| N Missing | 0 | 0 | 0 |
| Median | 2.00 | 2.00 | 2.00 |
| Mode | 2 | 2 | 2 |

Source: Survey Questionnaire, 2015

Table 12 shows, the attitude of respondents towards the factors of electronic banking adoption. The result indicates except the second question related to the age all others has a median and mode of 2.0 that indicated that most of the respondents agreed that computer experience, income level, educational level and security risk has an impact on the adoption of electronic banking. While the second question results in median and mode of 3.0 that indicates the highest percentage of the respondents not sure that the ages of individuals affect the adoption of electronic banking. Hence, the researcher observed that computer experience, income level, educational level and security risk affect the adoption of electronic banking and the age did not.

Table 12: The attitude of Respondents with the factors of adoption of banking

| | Electronic banking usage needs prior computer experience. | The age of individuals has an impact on the usage of electronic banking. | The income level affects the usage of electronic banking. | The educational levels of the individual have an effect on the usage of the electronic banking. | The usage of electronic banking service has a greater security risk. |
|---------|---|--|---|---|--|
| N | 348 | 348 | 348 | 348 | 348 |
| Valid | 348 | 348 | 348 | 348 | 348 |
| Missing | 0 | 0 | 0 | 0 | 0 |
| Median | 2.00 | 3.00 | 2.00 | 2.00 | 2.00 |
| Mode | 2 | 3 | 2 | 2 | 2 |

Source: Survey Questionnaire, 2015

4.3 Regression analysis

The regression analysis is used to test if independent variables influence a dependent variable and whether this effect is positive or negative. In this research the researcher, use Binary logistic regression analysis, which are used to test whether one or more independent variables (age, educational level, income level, computer experience and fear of security) influence a dependent variable (adoption of electronic banking) which has a binary outcome 0 or 1 and if this effect is positive or negative. However, before rushing towards data analysis and presentation the researcher first made a diagnostic test for the assumptions of the classical linear Regression model using SPSS 20 software.

4.3.1 Test of classical linear regression Model

Before running the regression analysis and hypothesis testing it is better to test the CLRM assumptions like heteroscedasticity, autocorrelation, normality and multicollinearity to know whether the assumptions are violated or not accordingly, the diagnostic test for the assumptions were done using SPSS 20 Software as presented and interpreted under here.

4.3.1.1 Heteroscedasticity Test

It has been assumed that the variance of the errors is constant, σ^2 ; this is known as the assumption of homoscedasticity. If the error does not have a constant variance, they said to be heteroscedastic. Consequence of proceeding with the existence of heteroscedasticity is that, the OLS estimators will still give unbiased (and consistent) coefficient estimates, but they are no longer BLUE that is, they no longer have the minimum variance among the class of unbiased estimators. According to Brooks (2008), it has been assumed, as the variance of the errors is constant and finite over all values of variables. The researcher uses the Breusch-Pagan/Cook-Weisberg test to test the heteroscedasticity problem using the SPSS 20.

Table 13 : Heteroscedasticity test

| | Prob > F |
|--------------------|----------|
| Breusch-Pagan Test | 0.9593 |

Source: Survey Questionnaire, 2015

Table 13 presents the BP/CW test of the regression calculated using SPSS 20 and the test value shows that 0.9593 which is greater than the P-value of 0.05. Hence, the researcher observed that regression model does not have the problem of heteroscedasticity.

4.3.1.2 Autocorrelation test

The notion of autocorrelation defines that there is no serial correlation or autocorrelation among the disturbances term entering the population regression function (Gujarati, 2008). The covariance between the error terms over time (or cross-sectional, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors were correlated with one another, it would be stated that they are auto-correlated or that they are serially correlated. A test for this assumption is therefore required which is tested by the DW test in this study. The DW test is a test for first order autocorrelation (a test for a relationship between an error and its immediately previous value).

As a rule of thumb, the DW test value can be from 0 to 4 and the DW value approaches 2 means it is an indication for no autocorrelation. However, if the value of the test is 0, then it is an indication for the existence of perfect positive autocorrelation. On the other hand, if the value of the DW test equals 4, that means there is perfect negative autocorrelation (Brooks, 2008).

Table 14 : Test of autocorrelation

| Model | Durbin-Watson |
|--------------------|---------------|
| Durbin-Watson Test | 1.966 |

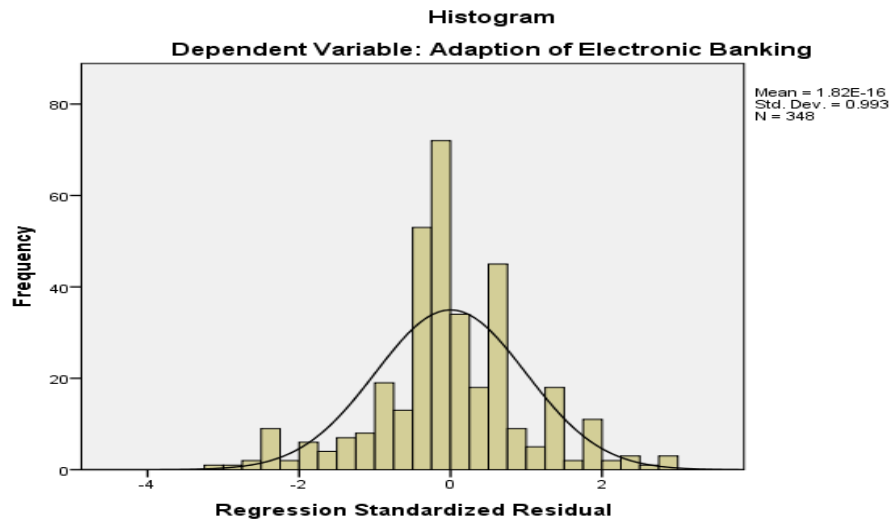
Source: Survey Questionnaire, 2015

Table 14 indicates for the model, the DW test stands at 1.966. This indicates that the models do not correspond with autocorrelation problem since the value is approaches to two. The values of the DW test are a few points away from the point that indicates no autocorrelation, therefore, there is no or little evidence of a relationship between successive residuals and the test show, as there is no autocorrelation problem.

4.2.1.3 Normality Test

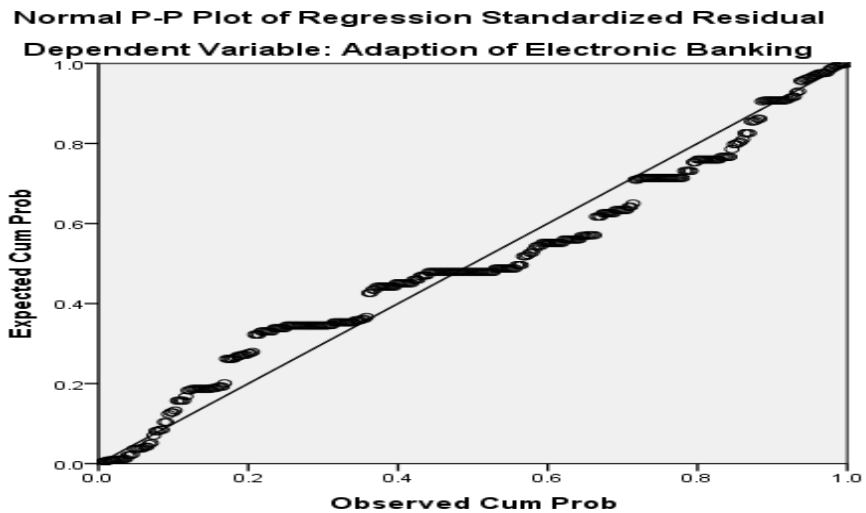
Normality is one of the assumptions of classical linear regression model that requires the disturbance to be normally distributed around the mean. For this study the graphical method for testing normality were applied using histogram and P-P Normal Plot

Figure 1 : Histogram



Source: Survey Questionnaire, 2015

Figure 2 : P-P normal Plot



Source: Survey Questionnaire, 2015

As indicated on figure 1 and figure 2 the assumption of normality pass the test to use the data for inference. All of the result from examined command suggest that the residuals or the error term are normally distributed around the meant zero and the standard deviation of 0.993 that means 99.3% of the values within the standard deviation of the mean. The bell-shaped histogram is the indication of the normal distributions of the residuals around its mean zero. Similarly, the P-P normal Plot shows the normal distribution of the residuals around its mean of zero. Hence, the model is normally distributed.

4.2.1.4 Multicollinearity Test

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another (Brooks, 2008). If there were no relationship between the explanatory variables, they would said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change. According to Brooks (2008), in any practical context, the correlation between explanatory variables were non-zero, although this will generally be relatively being in the sense that a small degree of association between explanatory variables will usually occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity. The most simple, operational definition of unacceptable co-linearity makes no pretense to theoretical validity. An admittedly arbitrary rule of thumb is established to constrain simple correlations between explanatory variables to be smaller than 0.8 to 0.9 (Donald, et.al, 2005). This assumption has been tested for the variables considered in the study as the independent variables (age, income level, computer experience, educational level and fear of security) using two methods. The first one is by calculating the correlation between the independent variables and the next one is by calculating the tolerance and variance inflation factor (VIF) using the SPSS software.

Table 15 : Person correlation

| Variables | AGE | Educational Level | Monthly Income | Computer experience | Fear of Security |
|---------------------|--------|-------------------|----------------|---------------------|------------------|
| AGE | 1 | | | | |
| Educational Level | -0.077 | 1 | | | |
| Monthly Income | 0.331 | 0.47 | 1 | | |
| Computer experience | -0.097 | 0.667 | 0.402 | 1 | |
| Fear of Security | -0.053 | -0.268 | -0.325 | -0.28 | 1 |

Source: Survey Questionnaire, 2015

In this particular case, the largest observed positive correlation for the independent variables of adoption of electronic banking in the table 15 is 0.667 between educational level and computer experience thus; this is sufficiently small as compared to the tolerable correlation sated for this particular study, which is 0.8. Based on this, it reasonably ignored. Therefore, there is no multicollinearity between the independent variables.

The study also conducts the other method for the test of multicollinearity that is variance inflation factor (VIF). According to Morgan, et al (2004), the one explanatory variable cannot be explained by other if the value of tolerance greater than 0.10 and the VIF of less than 10.0. therefore as table 16 indicates that the variance inflation factor for all variables are very far less than 10.0 with maximum VIF of 2.027 and the tolerance value is far greater than 0.10 and the minimum value is 0.493 for educational level. Therefore, there is no multicollinearity problem within the explanatory variables.

Table 16 : Variance inflation factor

| Variable | Collinearity Statistics | |
|---------------------|-------------------------|-------|
| | Tolerance | VIF |
| AGE | 0.807 | 1.24 |
| Educational Level | 0.493 | 2.027 |
| Monthly Income | 0.598 | 1.673 |
| Computer experience | 0.53 | 1.888 |
| Fear of Security | 0.866 | 1.155 |

Source: Survey Questionnaire, 2015

4.2.2 Hypothesis Testing

The hypothesis of the study was tested using the one-way ANOVA and the significance of the correlation between the dependent variable (adaption of electronic banking) and independent variables (age, computer experience, monthly income, educational level and fear of security).

H_1 : The Computer experience of customers of the banks will have a positive significant influence on the Electronic Banking service in Ethiopia.

Table 17 : The significance of correlation of Computer Experience and Adoption of E-Banking

| | | Adoption of Electronic Banking |
|---------------------|---------------------|--------------------------------|
| Computer experience | Pearson Correlation | .558 |
| | Sig. (2-tailed) | .000 |
| | N | 348 |

Source: Survey Questionnaire, 2015

Table 18 : ANOVA table of Computer Experience with Adoption of E-Banking

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|---------|------|
| Between Groups | 26.644 | 1 | 26.644 | 156.686 | .000 |
| Within Groups | 58.836 | 346 | .170 | | |
| Total | 85.480 | 347 | | | |

Source: Survey Questionnaire, 2015

The result in table 17 shows that there is a strong positive correlation of 0.558 between computer experience and adoption of electronic banking with a significant p value of 0.000 at 5% significant levels. Table 18 also shows the P value of 0.000 that is less than the significance point ($P < 0.05$) this indicates the relation is significant. Hence, H_1 is accepted that means the Computer experience of the customers have a positive significant

impact on the adoption of electronic banking and the customers who has a computer experience adapts electronic banking than customers who didn't has an experience in computer. The result is consistent with the findings of the Wadie Nasir, (2011), Garedachew, (2010) and Mohamed A, (2012).

H₂: The age of the customer of the banking service will have a positive significant influence on the adoption of Electronic Banking Service in Ethiopia.

Table 19 : Significance of correlation of age and adoption of E-Banking

| | | Adoption of Electronic Banking |
|-----|---------------------|--------------------------------|
| AGE | Pearson Correlation | .065 |
| | Sig. (2-tailed) | .229 |
| | N | 348 |

Source: Survey Questionnaire, 2015

Table 20 : ANOVA table of age with adoption of E-Banking

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|------|------|
| Between Groups | .393 | 4 | .098 | .396 | .812 |
| Within Groups | 85.087 | 343 | .248 | | |
| Total | 85.480 | 347 | | | |

Source: Survey Questionnaire, 2015

The result in table 19 Shows there is a weak positive correlation of 0.065 between age and adoption of electronic banking but the p value shows 0.229 that is not significant at 5% level of significance. Table 20 also shows the P value of 0.812 that is above the significance point of 5% this indicates the relation is not significant. Hence, H₂ is rejected and the age of the customers does not significantly affect the adoption of electronic

banking that means all age groups adapt electronic banking without difference. This result was supported by the findings of Shemsul H. and BilalM, (n.d).

H₃: The Income level of customers of bank will have a Positive significant influence on adoption of Electronic Banking service in Ethiopia.

Table 21 : Significance correlation of monthly income and adoption of E-Banking

| | | Adoption of Electronic Banking |
|----------------|---------------------|--------------------------------|
| Monthly Income | Pearson Correlation | .599 |
| | Sig. (2-tailed) | .000 |
| | N | 348 |

Source: Survey Questionnaire, 2015

Table 22 : ANOVA table of monthly income with adoption of E-Banking

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|---------|------|
| Between Groups | 43.662 | 3 | 14.554 | 119.725 | .000 |
| Within Groups | 41.818 | 344 | .122 | | |
| Total | 85.480 | 347 | | | |

Source: Survey Questionnaire, 2015

The result in table 21 shows that there is a strong positive correlation of 0.599 between monthly income and adoption of electronic banking with a significant p value of 0.000 at 5% significant levels. Table 22 also shows the P value of 0.000 that is less than the significance point of (P<0.05) this indicates the relation is significant. Hence, H₃ is accepted and the income level of the customers have a positive significant impact on the adoption of electronic banking and the customers with higher income adapts electronic banking that the customers with lower income group. The findings of the Shemsul H. and

BilalM, (n.d) and Mutengezanwa M, Mauchi F, (2013) and Mohamed A, (2012), support the result of the study.

H₄: The Educational Level of Customers of banks will have a positive significance effect on the adoption of Electronic Banking Service in Ethiopia.

Table 23 : Significance correlation of educational level and adoption of E-Banking

| | | Adoption of Electronic Banking |
|-------------------|---------------------|--------------------------------|
| Educational Level | Pearson Correlation | .627 |
| | Sig. (2-tailed) | .000 |
| | N | 348 |

Source: Survey Questionnaire, 2015

Table 24 : ANOVA table of educational level with adoption of E-Banking

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|---------|------|
| Between Groups | 43.662 | 3 | 14.554 | 119.725 | .000 |
| Within Groups | 41.818 | 344 | .122 | | |
| Total | 85.480 | 347 | | | |

Source: Survey Questionnaire, 2015

The result in table 23 shows that there is strong positive correlation of 0.627 between educational level and adoption of electronic banking with a significant p value of 0.000 at 5% significant levels. Table 24 also shows the P value of 0.000 that is less than the significance point ($P < 0.05$), this indicates the relation is significant. Hence, H₄ is accepted that means the educational level of the customers have a positive significant impact on the adoption of electronic banking and the customers with higher educational level adapts electronic banking that the customers with lower educational level. The

findings of Shemsul H. and Bilal M, (n.d), Mutengezanwa M., Mauchi F, (2013), Garedachew, (2010), Byoung, et.al (n.d), and Ernest, et.al, (2012), supported the result of the study.

H₅: The fear of the security of the customer has a negative significant influence on the adoption of Electronic Banking service in Ethiopia.

Table 25 : Significance correlation of Fear of Security and adoption of E-Banking

| | | Adoption of Electronic Banking |
|------------------|---------------------|--------------------------------|
| Fear of Security | Pearson Correlation | -.475 |
| | Sig. (2-tailed) | .000 |
| | N | 348 |

Source: Survey Questionnaire, 2015

Table 26 : ANOVA table of fear of security with adoption of E-Banking

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|---------|------|
| Between Groups | 19.247 | 1 | 19.247 | 100.548 | .000 |
| Within Groups | 66.233 | 346 | .191 | | |
| Total | 85.480 | 347 | | | |

Source: Survey Questionnaire, 2015

The result in table 25 shows that there is strong negative correlation of 0.475 between fear of security and adoption of electronic banking with a significant p value of 0.000 at 5% significant levels. Table 26 also shows the P value of 0.000 that is less than the significance point ($P < 0.05$) this indicates the relation is significant. Hence, H₅ is accepted that means the fear of security of the customers have a negative significant impact on the adoption of electronic banking and the customers with lower level of fear of security on

electronic banking adapts electronic banking that the customers with higher level of risk. The result of the study supported by the findings of the Wadie Nasir, (2011), Sonja Grabner K. and Robert J, (2011), Ayana Gemechu (2014) , Byoung, et.al (n.d), Wondwossen and Tsegai(2005), Khalfan, et.al, (2006), Sahah ,et.al, (2005), Yang, (1997) and Sathye, (1999).

4.2.3 Regression model estimation and interpretation

To estimate the model a binary logistic regression analysis was used. A logistic regression model was chosen due to the dichotomy character of the dependent variable adoption of E- banking (0 = non-adopter, 1 = adopter).

Table 27 : Estimation model of the regression

Model Summary

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|------|-------------------|----------------------|---------------------|
| 1 | 223.282 | .517 | .693 |

Source: Survey Questionnaire, 2015

Table 28 : Classification of the dependent variable

| Observed | | Predicted | | |
|--------------------------------|-------------|--------------------------------|---------|--------------------|
| | | Adaption of Electronic Banking | | Percentage Correct |
| | | Not adapted | Adapted | |
| Adaption of Electronic Banking | Not adapted | 126 | 25 | 83.4 |
| | Adapted | 22 | 175 | 88.8 |
| Overall Percentage | | | | 86.5 |

Source: Survey Questionnaire, 2015

The table 27 indicates the R-squared measures is an adequate fit of the model since both the Cox and Snell and Nagelkerke R-squared values are about 0.517 and 0.693, respectively, which is greater than 0.50. Table 28 shows the estimated model classifies 86.5% of the overall sample correctly, using a cut-off value for the predicted probability of 0.5. Further, the model classifies 88.8% of the adopters and 83.4% of the non-adopters correctly. The receiver operating characteristic (ROC) curve can be used to summarize the predictive power of the logistic regression model. The concordance index, which is

equivalent to the area under the ROC curve, shows a value of 0.894, which states an excellent performance of the estimated logistic regression model (Hosmer and Lemeshow, 2000).

Table 29 : Estimation of coefficients of the logistic regression

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|----------|--------|------|--------|----|------|--------|
| AGE | .016 | .185 | .008 | 1 | .929 | 1.017 |
| ELV | .620 | .131 | 22.379 | 1 | .000 | 1.859 |
| MIN | .731 | .152 | 23.264 | 1 | .000 | 2.077 |
| CEP | .964 | .415 | 5.392 | 1 | .020 | 2.623 |
| FSE | -1.919 | .356 | 29.088 | 1 | .000 | .147 |
| Constant | -3.129 | .610 | 26.314 | 1 | .000 | .044 |

Source: Survey Questionnaire, 2015

The results of the logistic regression analysis in the table 29 indicate that same result as the result of the hypothesis testing made above using one-way ANOVA and correlation between the dependent and independent variables. The coefficient of the variables age, educational level, and computer experience and income level has a positive relation with the adoption of electronic banking, with significant value of less than 0.05 except the variable age that is insignificant with the p value of 0.929. While the fear of security indicates a negative coefficient, with the significant value of 0.000, which is less than 0.05. Therefore, the estimated model value indicates that, the adoption of electronic banking in Ethiopia increases with the increment in the customers level of education, income and computer experience. While the adoption of electronic banking significantly decreases with the higher level of customers attitude with the fear of security of electronic banking.

CHAPTER FIVE: SUMMERY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Summery of findings and Conclusion

This study intended to examine the factors that affect the adoption of electronic banking by customers in Ethiopia, through adopting mixed research approach. The study identifies five determinants that may affect the adoption of electronic banking and analyze them using both the descriptive and regression analysis method using SPSS 20 analysis software's and the factors are identified based on their significance and sign.

The first factor that was tested using both descriptive analysis and regression analysis method is the computer experience of the customers in relation to the adoption of electronic banking and the result of the study indicates that the computer experience of the customer have a positive significant impact on the adoption of electronic banking.

The second factor that was tasted is the age of the customers by classifying the age with 5 classes staring from 20 years of age by 10 years gap and finally making above 60 years of age as one class and the finding indicates that there was no difference in adapting electronic banking. Therefore, from result the researcher conclude that age of the customers does not have a significant impact on the adoption of electronic banking.

The other factor tasted was the income level of the customers by classifying the income group in to four parts by making ETB 2,000.00 as lower level and above 10,000.00 as a higher level and the finding indicated that the customers with the higher income group adapts electronic banking higher that the lower group. Therefore, from the result the researcher conclude that the income level of the customers have a significance positive impact on the adoption of electronic banking.

The fourth factor that was tested is the educational level of the customer by classifying into seven groups starting from not educated to PHD holders and the finding indicates that the more educated customers adapt electronic banking more than that of the groups with lower education or not educated customers. Therefore, from the result the researcher conclude that the educational level of individuals have a positive significance impact on the adoption of electronic banking.

The last factor that was tested in the study was the security fear of the customers on the system with the adoption of electronic banking and the result indicates that from the customer does not adapt electronic banking has more fear of security than that of the adaptors. Therefore, from the result of the study the researcher conclude that the fear of the security have a negative significant impact on the adoption of electronic banking.

From the forms of electronic banking adapted by the customers of the bank all adaptors use the automated teller machine and some of the use Point of sell terminals and mobile banking but the result shows that no respondent uses the internet banking form of electronic banking.

Finally, the descriptive analysis part indicates some information's about the attitude of the customers. as the result indicates most of the customers agreed on the benefits getting from the adoption of electronic banking but they are not sure to get enough information about the basic tings rated to the adoption of electronic banking.

In general, the findings of this study offer additional insights into the current E-banking adoption situation and its implications for E-banking growth in Ethiopia as an example of a developing country. Furthermore, the understanding of the Determinant of E-banking adoption identified in this study may help to identify the best course of actions to promote its development. It will also be valuable to all banking industries of the country to increase their awareness and understanding of E-banking benefits.

5.3 Recommendation

E-banking system is a new financial evolution in Ethiopia. However, it's an important issue because it has a great impact on the whole banking system and it contributes a great roll in the devolvement of online markets in the country, that increase the income and image of the country at worldwide. At the same time it's difficult and need a lot of efforts to be adopted and accepted by the banking industry customers, so it need a lot of efforts to succeed. Based on the above findings, the researcher recommends the following points:

- As the above finding of the study indicates the computer, experience and educational level of the customers affect the adoption of electronic banking. Therefore, the researcher recommends that the banks in Ethiopia must work in **crating** easy-to-use electronic banking to all group of customers so, banks should aim to make their electronic banking as simple and easy to use as possible so that customers do not perceive them as being complicated or difficult to use. This gives insights for system developers to design an electronic banking system interface and websites, which are more user-friendly with clear instructions for users.
- The other major findings of the study are the negative effect of the security on the adoption of electronic banking. Hence, the banks must work on minimizing the security issues related to the adoption of the system by developing different mechanisms and working with its customers to enhance the sustainability and improvement in adoption of the system.
- The study also shows that from the adaptors of electronic banking no one respondent is using one of the forms of electronic banking that is internet banking. Hence, the banks must be work on the issues related to the adoption of internet baking in addition to the whole forms of electronic banking.
- Most of the respondents agreed on the issue that the Commercial bank of Ethiopia does not give necessary information related to electronic banking benefits, related risks and other basic information. Therefore, the researcher recommended that the banks must plan how to give information related to the system to its customers to improve the adoption of the system in a successful manner.
- Finally, the researcher wants to recommend to other interested researcher to make additional studies on the area of adoption of electronic banking in Ethiopia because we see the ratio of bank customers to the electronic banking adaptors there is minimal. Hence, analyzing the additional factors that hinder the customers of banks from adapting electronic banking is very essential.

BIBLIOGRAPHY

- Abiy, D 2008, capital, weekly newspaper, March 17, 2008.
- Aghdassi, M. Persson, L., and Ghasemi, R 2007. Association between strategic values and E banking adoption in Iranian banks, research paper, industrial marketing and purchasing group
- Ahmed, H, 2011, Electronic Banking Adoption Model in Palestine, MA thesis, An-Najah, National University, Palestine
- Alagheband, P, 2006, Adoption of electronic banking services by Iranian Customers, MA thesis, Lulea University of Technology,
- Almazari, A. A. K., and Siam, A. Z. (2008). E-Banking: An Empirical Study on the Jordanian Commercial Banks. *Journal of King Abdul-Aziz University* 22(2), 3-26.
- Alsabbagh, Molla, A 2004, Adoption and use of internet banking in the Sultanate of Oman, *Journal of internet banking and commerce* and I.
- Arndt, S., Clavenger, J. & Meiskey, L. (1985). Students' attitudes towards computers. *Computers and the Social Sciences*, 1, 181-190.
- Asrat, S 2010, Reporter, weekly news paper.
- Ayriga, A. (2011). Is Mauritius Ready to E-Bank? From A Customer and Banking Perspective. *Journal of Internet Banking and Commerce*, 16(1).
- Balachandher, K, Santha, V and Norhazlin, I 2010, Electronic Banking in Malaysia: A Note on Evolution of Services and Consumer Reactions.
- Banji, O and Catherine, A 2004, Internet Access in Africa: Empirical Evidence from Kenya and Nigeria.
- Bartel, A. P., & Sicherman, N. (1998). Technological change and the skill acquisition of young workers. *Journal of Labor Economics*, 16(4), 718-755.

- Bayus, B. (1987), Forecasting sales of new contingent products: An application to the compact disc market. Journal of Product Innovation Management, 4(December), 243-255.
- Binyam, T 2009, Daily Monitor, February, 20, 2009.
- Booz, R, Allen, G and Hamilton, L 1997, Internet banking, A global study of potentials. Booz, Allen and Hamilton Inc. New York, NY.
- Byoung-M, Richard W, and Tansel Y. (n.d) The Determinants of Consumers' Adoption of Internet Banking Purdue University.
- Chong, S and Pervan, G 2007, Factors Influencing the extent of deployment of electronic commerce for small business and medium sized enterprises,
- Cochran, W. G. (1977). Sampling techniques (3rd ed.). New York: John Wiley & Sons.
- Creswell, W 2003, Research Design: Qualitative, Quantitative and Mixed Approaches, 2nd edition. Sage publication, California.
- Daghfous, N and Toufaily, E 2007, The adoption of Electronic Banking by Lebanese banks: success and critical factors, research paper.
- Dashen bank 2011, Annual Report.
- DeLone, W. H. (1988). Determinants of success for computer usage in small business. MIS Quarterly, 12(1), 51-61.
- DeLone, W. H. (1988). Determinants of success for computer usage in small business. MIS Quarterly, 12(1), 51-61.
- Eldabi, T 2002, Quantitative and qualitative Decision Making Methods in Simulation Modelling, Management Decision, 40(1):64-73.
- Ernest, E, Ogbuji C, Onuoha A, Kalu S, (2012), Impact of Demographic Variables on Consumers' Adoption of E-banking in Nigeria: An Empirical Investigation, European Journal of Business and Management, Vol 4, No.17, 2012.

- Forster, T 1998, *Industrial Marketing Communication: An Empirical Investigation on the use of Marketing Communication Tools* Licentiate Thesis, Lulea University of Technology.
- Furst, K and Nolle, D 2002, *Internet banking: developments and prospects*.
- Gardachew, W 2010, *Electronic -banking in Ethiopia: practices, opportunities and Challenges*, *Journal of internet Banking and commerce*.
- Gerrard, P and Cunningham, J 2003, *The diffusion of internet banking among Singapore consumers*, *International Journal of Bank Marketing*,
- Gerrard, P, Cunningham, J and Devlin, J 2006, *Why consumers are not using Internet Banking: a qualitative study*, *Journal of Services Marketing*.
- Getahun, N 2008, *Policy initiatives for improved financial service provision: the case of Ethiopia*, *National Bank of Ethiopia*.
- Ghazi, A & Khalid, A 2012, *E-business Enablers and Barriers: Empirical study of SME in Jordanian communication sector*, *Global journal of Business Research*, 6(3):1-15.
- Gibbs, J, Kraemer, K and Dedrick, J 2003, *Environment and Policy factors shaping E-commerce diffusion: a cross-country comparison*.
- Giglio, V 2002, *Privacy in the world of cyber banking: emerging legal issues and how you are protected*.
- Graziano, M and Raulin, L 1997, *Research Methods: A process of Inquiry*, 3rd Ed. Wesley Educational Publisher Inc. New York, Addison.
- Gronau, R., & Hamermesh, D. S. (2001). *The demand for variety: A household production perspective*. National Bureau of Economic Research Working Paper.
- Grover, V 1993, *An Empirical derived model for the adoption of customer- based inter organizational systems'*, *Decision Science*, 24:603-638.

- Hair, et al. 2006, Marketing Research, with in changing information environment, 3rd edition, Tata McGraw-Hill Publishing Company limited, New Delhi.
- Hoppe, R Newman, P and Muger, P 2001, Factors affecting the adoption of internet banking in south Africa' a comparative study.
- Hosmer, D.W. and Lemeshow, S. (2000) Applied Logistic Regression, 2nd ed., New York, Wiley.
- Igbaria, M., Guimaraes, T., & Davis, G. B. (1995). Testing the determinants of microcomputer usage via a structural equation model. *Journal of Management Information Systems*, 11(4), 87-114.
- Jayawardhena, C and Foley, P 2000, Changes in the banking sector: the case of Internet banking in the UK Internet Research.
- Kamrul, H 2009, Electronic Banking in Bangladesh: The Future of Banking, School of Business Studies, MA thesis, State University of Bangladesh.
- Karjaluoto, H, Mattila, M and Pento, T 2002, Factors underlying attitude Formation Towards online banking in Finland, *International Journal of Bank Marketing*.
- Kassim, N 2005, Electronic Banking service quality: Gaps in Qatari banking industry.
- Kerem, K 2003, and Adoption of electronic banking: underlying consumer behavior and critical success factors Case study of Estonia, paper presented at the 2003 conference of the technology and everyday life network, London, U.K.
- Khalfan, A, Alrefaei, S and Al-Hajery, M 2006, Factors influencing the adoption of internet banking in Oman: a descriptive case study analysis.
- Khanfar, K Rashed, A, Elzamly, M and Elmasri, A 2006, Customer Satisfaction with internet banking web Site: Case study on the Arab Bank, Research paper, The Arab Academy for Banking and Financial Sciences, Jordan.
- Laukkanen, T 2008, Internet banking vs Mobile banking innovators and adopters.

- Leedy, P 1989, Practical Research, Planning and Design, 4th ed. Macmillan.
- Leelapongprasut, P, Praneetpolgrang, P and Paopoun, N 2005, A qualitative Study Of internet banking in Thailand.
- Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes towards computers. *Journal of Educational Computing Research*, 5(1), 69-88.
- Malak, J 2007, Readiness of the Palestinian banking sector in adopting the electronic banking system: exploratory study, MA thesis, The Islamic University of Palestine.
- McNabb, D 2004, Research method for political science: Quantitative and Qualitative Methods, Prentice-Hall of India, New Delhi.
- Mohammed Arif Shaikh, 2014: Ethiopian Banker's Perception of Electronic Banking in Ethiopia – A Case of Adama City.
- Mohamed A. Ismail, (2012), Factors Influencing the Adoption of E-banking in Sudan: Perceptions of Retail Banking Clients, *Journal of Internet Banking and Commerce*, vol. 17, no.3 (<http://www.arraydev.com/commerce/jibc/>)
- Mutengezanwa Margaret and and Mauchi Fungai Ngoma, (2013), Socio-demographic factors influencing adoption of internet banking in Zimbabwe, *Journal of sustainable development in Africa*, volume 15, no.8.
- Naichiamas, D and Frankfort, C 1996, Research Methods in the Social Sciences, 5th edition. CA Arnold, Santa Crux.
- NCA (2006). Competition in Nordic Retail Banking, Report No. 1/2006, Nordic Competition Authorities.
- Pham, L 2010, A conceptual framework for Electronic Banking service quality in Vietnam, *The Business Studies Journal*, 4(3):1-19.
- Polatoglu, V and Ekin, S 2001, An empirical investigation of the Turkish consumers Acceptance of Internet banking services.

- Poon, W 2008, Users adoption of Electronic Banking services: The Malaysian perspective, *Journal of Business and Industrial Marketing*, 21(1): 59-69.
- Ram, S & Sheth, and N 1989, Consumer resistance to innovations: the marketing problem and its solutions, *The Journal of Consumer Marketing*, 6(2):5-14.
- Rosalina, M and Javaheri, M 2006, Drivers and Barriers of implementing E- commerce in Iran. Naragh University of Iran.
- Salman, S and Kashif, S 2010, Electronic banking and E-readiness adoption by Commercial Banks in Pakistan, Master's Thesis, Linnaeus University, School of Computer science, physics and mathematics.
- Salwani, et al. 2009, E-commerce usage and business performance in the Malaysian tourism sector: empirical analysis', *Information Management and Computer Security*. 17(2):166-185.
- Sathye, M 1999, Adoption of Internet banking by Australian consumers: an empirical investigation.
- Shah, M, Branhganza, A, Khan, S, and Xu, M, 2005, A survey of critical success factors in Electronic Banking, research paper, European and Mediterranean Conference on information systems UK.
- Shamsul H. and Bilal M. (n.d), Impact of demographic factors in adoption of e-banking, *international journal of advanced research in management and social sciences*.
- Sohail, S and Shanmugham, B 2003, Electronic Banking and customer preferences in Malaysia: an empirical investigation, *information sciences-informatics and computer Science*.
- Sonja Grabner-Kräuter and Robert J. Breitenecker, (2011), Factors influencing online banking adoption: evidence from the Austrian market, *International journal of Internet Marketing and Advertising*, Vol. 6, No. 4.

- Tan, M., and Teo, T. S. H. (2000). Factors influencing the adoption of Internet banking. *Journal of the AIS*.
- Turban, D 2008, *Electronic commerce: a managerial perspective*, 4th Edition, Prentice Hall.
- Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- Wadie Nasri, (2011), Factors Influencing the Adoption of Internet Banking in Tunisia, *International Journal of Business and Management*, Vol. 6, No. 8.
- Wondwossen, T and Tsegai, G 2005, E-payment: challenges and opportunities in Ethiopia.
- Yang, Y 1997, the security of electronic banking, a research paper.
- Yin, R 1989, *Case Study Research Design and Methods: Applied Social Research Methods' Series*, vol. 5, Sage publications.
- Yin, R 1994, *Case Study Research Design and Methods*, applied Social Research Methods Series, 2nd Edition, Sage Publishing, and Newbury.
- Zhao, et al. 2008, Perceived risk and Chinese consumers' internet banking Service Adoption.
- Zhao, L, Koenig-Lewis, N, Hanmer-Lloyd, S and Ward, P 2010, Adoption of Internet Banking services in China.
- Zhu, K, Kraemer, K and Xu, S 2003, Electronic business adoption by European firms: a Cross-country assessment of the facilitators and inhibitors.

APPENDIX I: QUESTIONER ENGLISH VERSION

Dear Sir/Madam

My name is Ewunetu Tadesse Disassa, MSC student in department of Accounting and Finance at Jimma University. The aim of this questionnaire is to identify the Determinants of Adoption of Electronic banking by customers of Commercial bank of Ethiopia. The information you provide in response to the items in the questionnaire will be used as part of the data needed for a study of adopting E-banking. The results of the study are anticipated to supply to the understanding of the basic determinants of E-banking in delivering of the service to customers in commercial banks of Ethiopia. I would like to assure you that the information you provide will be used only for the purpose of achieving academic award. Your involvement is regarded as a great input to the quality of the research results. Hence, I believe that you will enlarge your assistance by participating in the study. Your honest and thoughtful response is invaluable.

Thank you for your participation

Ewunetu Tadesse Disassa,

MSc student at Jimma University

Collage of Business and Economics

Department of Accounting and Finance

General Instruction

This questionnaire contains three sections that will be expected to take approximately 10 minutes to complete. Please provide your responses to the questions based on the instructions under each section. If you have comments or if you want to provide further explanations, please use the space provided at the end of the questionnaire.

Section I: Demographic profile of respondents

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

1. Gender:

Male ()

Female ()

2. Age:

20-30 ()

31-40 ()

41-50 ()

51-60 ()

above 60 ()

3. Educational level:

Elementary or not educated ()

High school (Not completed) ()

High school Complete ()

Diploma holder ()

First degree holder ()

Masters degree ()

PHD ()

other _____

4. Monthly income (in Eth. Birr):

Below 2,000 ()

2,000 to 5,000 ()

5,000 to 10,000 ()

above 10,000 ()

Section II: General Information

Please indicate the following by ticking (√) on the spaces in front of the response options:
you may tick more than one for some of the questions.

5. Do you have an experience in using computer?

Yes ()

No ()

6. If your answer for question number 5 is 'Yes', For how many years did you use
computer?

Below one year ()

above one year ()

7. Did you have the access of one or more forms of Electronic banking service?

Yes ()

No ()

If your answer for question number 7 is Yes, please give answer for question 8 to 10.

8. Which form of Electronic banking did you use?

Automated Teller Machine (ATM) ()

Point of sales Terminal (POS) ()

Mobile Banking ()

Internet Banking ()

9. How many times per month did you use one of the Electronic banking form?

Frequently when I need ()

Sometimes when I didn't have access for bank ()

I Have the access to use but I didn't use till today ()

Other please specify _____

10. If you didn't Use the Electronic Banking even you have the access what are the reasons?

I didn't have the knowledge how to use the system ()

I have the knowledge but I fear the risk of the system security ()

Other please specify _____

11. If your answer for question number 7 is No, what are the reasons for not accessing Electronic Banking?

I didn't have information about the system

I didn't have the knowledge how to use the system ()

I fear the security of the system ()

I did not have that much money in my account to use the system ()

Other Please Specify _____

12. Did you have fear of the security of electronic banking system?

Yes ()

No ()

Section III Questions related to Factors that affects Electronic banking in Ethiopia

Instruction: Below are lists of statements pertaining to factors that affect E-banking in Ethiopia. Please indicate whether you agree or disagree with each statement by ticking (√) on the spaces that specify your choice from the options that range from 'strongly agree' to 'strongly disagree' and each choice were identified by numbers ranged from 1 to 5.

1 - strongly agree

2 - agree

3 - neutral

4 - Disagree

5 - Strongly disagree

| | | | | | | |
|----|--|---|---|---|---|---|
| 13 | The implementations of electronic banking have good news for customers of the bank. | 1 | 2 | 3 | 4 | 5 |
| 14 | Electronic banking makes life easy to do banking activities. | | | | | |
| 15 | Commercial bank of Ethiopia gives enough information and guidance about the benefits, related risk, and other basic information's related to electronic banking. | | | | | |

| | | | | | | |
|----|--|--|--|--|--|--|
| 16 | Electronic banking enables customers to complete banking activities more quickly than retail banking | | | | | |
| 17 | Electronic banking improves customer service given by the bank. | | | | | |
| 18 | Electronic banking improves accessibility of banks. | | | | | |
| 19 | Electronic banking usage needs prior computer experience. | | | | | |
| 20 | The age of individuals has an impact on the usage of electronic banking. | | | | | |
| 21 | The income level affects the usage of electronic banking. | | | | | |
| 22 | The educational level of the individual has an effect on the usage of the electronic banking. | | | | | |
| 23 | The usage of electronic banking service has a greater security risk. | | | | | |

APPENDIX II: QUESTIONER AMHARIC VERSION

□□ □□□/□□□□

□□ □□□□ □□□ □□□□ □□□ □□□□□□ □□□□□□□□ □□□□□ □/□□□□
□□□□□ □□□ □□□ □□□; □□□ □□□□ □□ □□□ □□□□ □□□ □□□□□□
□□□ □□□□ □□□□ □□□□□□□□ □□□ □□□□□□ □□□□□ □□ □□□ □□□□
□□□□ □□□□□ □□□□ □□□□ □□□ □□□□ □□□□□□ □□□ □□□ □□□□
□□□□ □□□□□□□□ □□□□□□ □□□□□□ □□□□□□□ □□□ □□□□ □□□□
□□□□□ □□□□ □□□ □□□□□□□□ □□□□□ □/□□□□□ □□□□□□ □□□□□
□□□□ □□□□□□□□□□ □□□□□ □□□□□□□

□□□□□□□ □□□□□ □□□□□□□□□□

□□□□ □□□ □□□

□□□ □□□□□□ □□□□□ □□□ □□□

□□□□□ □□□□□□ □□□

□□□□□□□ □□□□□ □/□□□□

□□□□□ □□□

□□ □□ □□□□ □□□ □□□□ □□□ □□□□ □□□□□□ □□□ □□ □□□□□□

□□□□ □□□□ □□□□□ □□□□□□□□ □□□□ □□□ □□□ □□□ □□□□ □□□□

□□□□□□

□□□ □□□□ □□□□□□□ □□□

1) □□□-

□□□□ ()

□□ ()

2) □□□

20-30 () 31-40 () 41-50 () 51-60 () □ 60 □□□□ ()

3) □□□□□□ □□□

□□□□ □□□ □□□□ □□□□□ □□□□□□ () □□□□ □□□ □□□□□□□ ()

□□□□ □□□ □□□□□ ()

□□□□ (10+1□10+2□10+3) ()

□□□□□□ □□□ ()

□□□□□□ □□□ ()

□□□□□□ □□□ ()

□□ _____

4) □ □□ □□

□2000 □□ □□□

□2000 □□□ 5000 □□

□5000 □□□ 10000 □□

□10000 □□ □□□

□□□ □□□□ □□□□□□□ □□□□□ □□□

□□□□□□□ □□□ (√) □□□□□ □□□□□□ □ □□□□□ □□□□□ □□□□ □□□□
□□□ □□□□ □□□□□□□

5) □□□□□□□ □□□ □□□?

□□□□ ()

□□□□□ ()

6) □ □□□□□□ □□□ □□□ □□□ □□□ □□□ □□□ □□□□□□ □□□□□□
□□□ □□□?

□□□□ □□□ □□□ ()

□□□□ □□□ □□□ ()

7) □□□□□□□□□ □□□ □□□□□□ □□□□ □□?

□□□□ ()

□□□□□□□ ()

□□□□□□□ □□□ □□□□ □□□ □□□□ □□□□ 8 □□□□ 10 □□□□ □□□□

8) □□□□□□ □□□□ □□□□□□□□□ □□□ □□□□□□ □□□□ □□?

Automated Teller Machine (ATM) ()

Point of sales Terminal (POS) ()

□□□ □□□□ □□□□□□□□□□ □□□ □□□□□□□ □□□□□□

□□□ □□□□□ □□□□□□□□□□ □□□ □□□□□□ □□□□□□ □□□□□ □□□□□

□□□ □□□□□ □□□□ □□ □□□□□□□□ □□□□□□□□ □□□ □□□□□ □□□□

□□□ □□□ □□□□□□ □□□□□□ □□□□□□ □□□□□□ □□□ □□□□ (√)

□□□□□ □□□□□ □□

1- □□□ □□□□□

2- □□□□□

3- □□□ □□□□

4- □□□□□□

5- □□□ □□□□□□

| | | 1 | 2 | 3 | 4 | 5 |
|----|--|---|---|---|---|---|
| 13 | □□□□□□□□□ □□□ □□□□□□ □□□□ □ □□□ □□□□□ □□□□ □□ □□ | | | | | |
| 14 | □□□□□□□□□ □□□ □□□□□□ □ □□□ □□□□□□ □□□□□□ □□□ □□□□□□ | | | | | |
| 15 | □□□□□□ □□□ □□□ □□□□□□□□□ □□□ □□□□□□□ □□□□□□ □□ □□□ □□□□ | | | | | |
| 16 | □□□□□□□□□ □□□ □□□□□□ □ □□□ □ □□□ □□□□□□ □□□ □□□ □□□□□□ □□□□ | | | | | |

| | | | | | | |
|----|---|--|--|--|--|--|
| 17 | □□□□□□□□ □□ □□□□□□ □ □□□□□ □□□ □□□□□ | | | | | |
| 18 | □□□□□□□□ □□ □□□□□□ □ □□□□ □□□□□□ □□□□□ | | | | | |
| 19 | □□□□□□□□ □□ □□□□□□ □□□□□ □ □□□□□□ □□□□ □□□□□ | | | | | |
| 20 | □ □□□□ □□□ □□□□□□□□□ □□□ □□□□□□ □□□□□ □□ □□□ □□□ | | | | | |
| 21 | □□□□□ □□□ □□□ □□□□□□□□□ □□□ □□□□□□ □□□□□ □□ □□□ □□□ | | | | | |
| 22 | □□□□□ □□□□□□ □□□ □□□□□□□□□ □□□ □□□□□□ □□□□□ □□ □□□ □□□ | | | | | |
| 23 | □□□□□□□□ □□ □□□□□□ □□□□□ □□□□ □□□□ □□□ □□□ | | | | | |