

Factors Affecting Adoption of Electronic Banking System in Ethiopian Banking Industry

Ayana Gemechu Bultum¹

Abstract

The aim of this paper is to identify factors that affect adoption of E-banking in the Ethiopian banking industry. The study was conducted based on the data gathered from four banks in Ethiopia; three private banks (Dashen bank, Zemen bank and Wegagen bank) and one state owned bank (commercial bank of Ethiopia). A mixed research approach was used to answer the research questions that emerge through the review of existing literature and the experiences of the researcher in respect of the E-banking system in Ethiopia. The study statistically analyzes data obtained from the survey questionnaire. A research framework developed based on technology-organization-environment model (TOE) developed by Tornatzky and Fleischer. The result of the study indicated that, the major barriers Ethiopian banking industry faces in the adoption of Electronic banking are: security risk, lack of trust, lack of legal and regulatory 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 be focused on technological innovation competition rather than traditional bases of retail bank competition.

Key Words: E-banking, Mixed research approach, Technology organization environment frame work (TOE)

1. Introduction

The rapidly growing information and communication technology (ICT) is knocking the front-door of every organization in the world, where Ethiopian banks would never be exceptional. In the face of rapid expansion of electronic payment (E-payment) systems throughout the developed and the developing world, Ethiopian's financial sector cannot remain an exception in expanding the use of the system (Gardachew 2010, p.2). 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 E-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 (E-banking) system is not well developed in Ethiopia.

¹ Ambo University, College of Business & Economic, Department of Accounting and Finance
P. O. Box 19, Ambo, Ethiopia

All banks in Ethiopia are too late to move with technological advancement and they should clearly chart out the time schedule for their integration and technological advancement. Some of the banks even today do not have their own websites which can help them to provide at least the information on financial services offered by them.

All most, all banks operated in Ethiopia with some exemptions² provide service to customers by using traditional systems, that is why every bank customer is highly dissatisfied by the disappointing status of financial development in Ethiopia. Even the time wasted in travelling for search of bank branches and the long waiting time to access the account is really disappointing. This is particularly because of the non-integration of branches of the same bank, i.e. even within individual banks their branches are not linked to each other and it is a must to physically visit the branch in which an account has been opened.

As it is stated in different E-banking literature some of the problems related with adoption of E-banking are: Low level of internet penetration and poorly developed telecommunication infrastructure. According to Jensen (2003), most countries in Africa, except South Africa, have Internet infrastructure only in their major cities. Lack of suitable legal and regulatory framework for E-commerce and E-payment is another impediment for the adoption of new technology in banking industry. Ethiopia has not yet enacted legislation that deals with E-commerce concerns including enforceability of the validity of electronic contracts, digital signatures and intellectual copyright and restrict the use of encryption technologies and High rates of illiteracy. Low literacy rate is a serious impediment for the adoption of E-banking in Ethiopia as it hinders the accessibility of banking services. For citizens to fully enjoy the benefits of E-banking, they should not only know how to read and write but also possess basic ICT literacy (Gardachew 2010). But risks related with security issue, lack of competition among local & foreign banks and social awareness on the E-banking system were not addressed.

In order to encourage further E-banking adoption in developing countries, a better understanding of the barriers and drivers impacting E-banking adoption is critical (Zhao *et al.* 2008). By gaining an in-depth understanding of the factors and conditions that influence developing country's ability to fully adopt and realize its benefits, strategic implications can be generated for the researchers and practitioners regarding how to promote the growth of E-banking in the developing countries. However, despite the importance of these adoptions, limited studies are currently available in developing countries, especially in Ethiopia. Therefore, more studies are still required to understand the relevance of E-banking in the country to identify areas in which the country lags behind that inhibit their E-banking adoption and diffusion. Therefore, to address the current gap in the literature, this study is designed to identify the E-banking adoption situation in Ethiopia and commonly focusing on the investigation of factors that affect adoption of E-banking system.

The remaining parts of the paper are organized as follows. The second section presents review of literature. The third section provides Objective of the study. The fourth section provides methods, while the fifth section is results. The final section, section six presents conclusion.

2. Literature Review

2.1. Theoretical Issues

E-banking has a variety of definitions all refer to the same meaning, the following section show some of these definitions.

² Some Banks like the largest government owned Commercial Bank of Ethiopia (CBE), Zemen Bank, Dashen bank and Wegagen bank uses ATM machine and other technological tools to provide service to the customers in addition to service provided at bank office.

E-banking is a form of banking service where funds are transferred through an exchange of electronic signal between financial institutions, rather than exchange of cash, checks, or other negotiable instruments (Kamrul 2009). E-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 (Malak 2007).

The term of E-banking often refers to online banking/Internet banking which is the use of the Internet as a remote delivery channel for banking services (Furst & Nolle 2002, p.5). 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 E-banking is that "E-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, p.2). It should be noted that electronic banking is a bigger platform than just banking via the internet.

E-banking can be also defined as a variety of platforms such as internet banking or (online banking), TV-based banking, mobile phone banking, and PC (personal computer) banking (or offline banking) whereby customers access these services using an intelligent electronic device, like PC, personal digital assistant (PDA), automated teller machine (ATM), point of sale (POS), kiosk, or touch tone telephone (Alagheband 2006, p.11). Different forms of E-banking system were discussed as follows.

1. 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 (PIN).

2. 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 card holder to the store's account (Malak 2007).

3. 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.

4. 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 (SMS).

Banks offer Internet banking in two main ways. An existing bank with physical offices can establish a Web site and offer Internet banking to its customers in addition to its traditional delivery channels. A second alternative is to establish virtual branchless or Internet-only, Bank almost without physical offices. Virtual banks may offer their customers the ability to make deposits and withdraw funds via ATMs or other remote delivery channels owned by other institutions (Furst & Nolle 2002, p.5). In the context of this study E-banking were not considered as only transferring of service by using internet connection rather it considered as multi channel service provided through ATM, internet banking, Mobile banking (Modbirr system), point sale terminal and telephone banking.

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, through the use of intranet propriety software. The users of these services were, however, mainly corporate customers rather than retail ones (Sohail & shanmugham 2003). The security first network bank was the first Internet banking in the world that was built in 1995 in USA. After that some famous banks introduced their internet banking one after another, such as Citibank and bank of America.

E-Banking System in Ethiopian Banking Industry

The appearance of E-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. But, 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 E-Banking since 2006. (Gardachew 2010)

Dashen bank, a forerunner in introducing E-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, Dashen's ATM service expanded to 70 and 704 POS terminals (Annual report of the bank 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.

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. Dashen's Modbirr users can transfer 500 birr to other Modbirr users in 24 hours a day. This would make Dashen Bank the first private bank in Ethiopia to acquire E-commerce and mobile merchant transactions (Amanyehun 2011). 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 E-banking gateway was signed between Ethiopian Commodity Exchange (ECX) and Dashen Bank and CBE. The E-banking system being developed with both banks is 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 Fettan ATM network. If everything goes as planned, Fettan 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).The following table 2.1 provides the E-banking services, which are available in the Ethiopia banking industries at present.

Table 2.1. E-Banking Services Provided by Four Ethiopian Banks

Banks	Services
Commercial Bank of Ethiopia(CBE)	Automated teller machine,(ATM) and Telephone bill payments, point of sales terminal(POS)
Dashen bank	Automated teller machine (ATM), Mobile Banking (Modbirr), point of sale (POS) terminals, Telephone banking.
Wegagen Bank	Automated teller machine, (ATM), point of sale (POS) terminals and Telephone banking service.
Zemen Bank	Automated teller machine, (ATM), online banking. Point of sale (POS) terminals, internet banking, Mobile/phone banking

Source: The researcher, 2012

Factors Influencing Banks to Adopt E-Banking System

Many researchers have been used different frame works in the study of adopting new technological innovation. Among frameworks that have been developed based on the past studies includes, the Technology-organization-Environment framework (TOE) (Tornatzky & Fleischer 1990),which identifies three basic Factors for the adoption of technological innovation, i.e, technological factors, organizational and environmental factors.

TOE framework was proposed by Tornatzky and Fleischer; it is designed for studying the likelihood of adoption success of technology innovations.

This framework is a comprehensive and well received framework in the context of innovation adoption by organizations and has been used in many studies (Salwani, *et al*, & Ellis 2009; Chang *et al* 2007, Zhu & Kraemer 2006).

According to Tornatzky and Fleischer (1990), technology adoption within an organization is influenced by factors pertaining to the technological context, the organizational context, and the external environment. Based on this, the researcher adopts the TOE framework to summarize possible key factors affecting E-banking adoption as shown in Figure 4.1.as follows

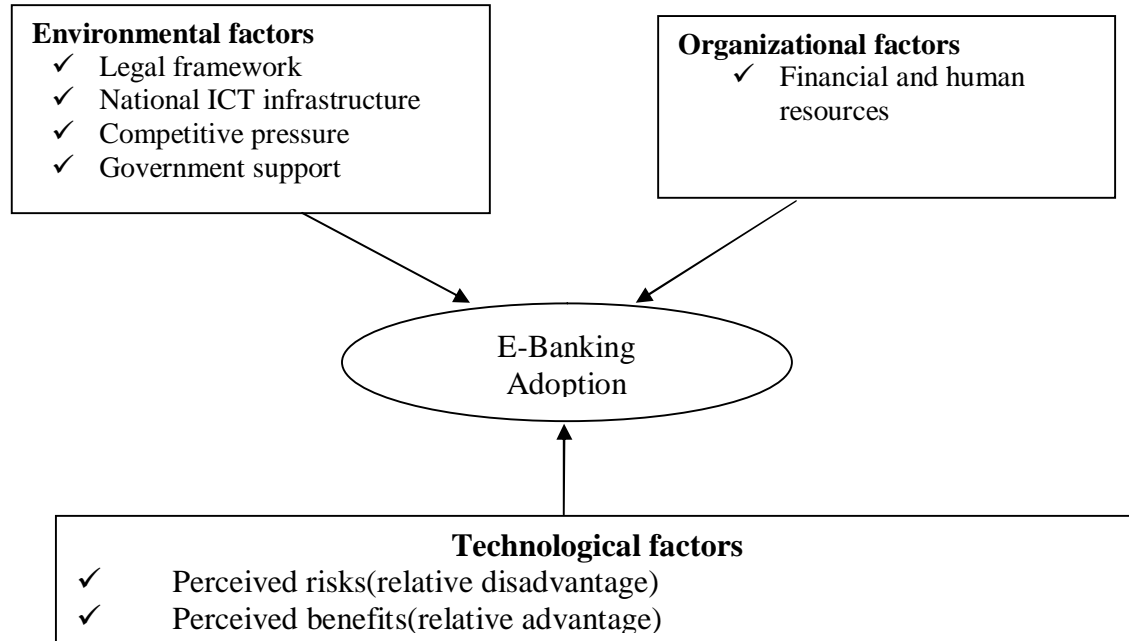


Figure: 2:1. Technology-Organization-Environment framework

Source: Tornatzky and Fleischer (1990)

The *technological factor* refers to adopter's perception of E-banking attributes. Typical characteristics of technology considered in technology adoption studies are based on the assumption of Roger's diffusion of innovation (Rogers 2003), Which include relative advantages (perceived benefits), and relative disadvantages (perceived risks).While the *organizational factor* refers to the organization's characteristics that influence its ability to adopt and use of E-banking system. The *environmental factor* refers to the external environment in which an organization operates and its condition for supporting the development of E-banking services. For each context, various factors have been identified from the literature but only those that are considered relevant for E-banking adoption are included in the framework. Details of factors considered in this study are discussed below.

2.2. Empirical Evidences

Some related studies are conducted by different researchers in different parts of the world. However, there are limited numbers of studies conducted in Ethiopia on the adoption of technological innovation. Specifically, Gardachew (2010) conducted research on the opportunities and challenges of E-banking in Ethiopia. The aim of his study was focused on analyzing the status of electronic banking in Ethiopia and investigates the main challenges and opportunities of implementing E-banking system. The author conducted a survey on the existing operating style of banks and identifies some challenges of using E-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.

Wondwossen and Tsegai (2005) also studied 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, which is contradicting with the finding of the previous study.

On the other hand the study conducted by Daghfous and Toufaily (2007) on the success and critical factors in adoption of E-banking by Lebanese banks. The research was conducted on the factors that can lead to success the adoption of E-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 E-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 makers` international experience and mastery of innovation) are variables which exert significant impact on the adoption of E-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 E-banking, also the result shows that banks which are developing in the international scale are more likely to adopt E-banking innovations. Finally the result of the study indicated that extent of penetration of E-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.

The study of Shah *et al.* (2005) on critical success factors (CSF) in E-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 E-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) were 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.

Factor analysis, which was done to group together, related variables to uncover factors (in terms of factor analyses), found the following factors to be critical for the success in E-banking. Issues related to organizational flexibility and speed of services delivery were found to be at the top of the importance list. Issues related to organizational flexibility and speed of services delivery were found to be at the top of the importance list. Business processes and systems integration and enhanced customer services were next in the list of importance.

Gerrard *et al.* (2006) in their study in Singapore identify 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, "Concern about risk was mentioned by all respondents. 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).

The study of Kerem (2003) on the adoption of electronic banking: underlying consumer behaviour 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 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 and foremost better access to the services (convenience), better prices and higher privacy. Better service (i.e. preferring self service over 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.

Also 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 critical success factors (CSFs) in E-banking is important for banking industries because it would potentially help them improve their strategic planning process.

The main obstacles and barriers that oppose E-banking adoption are the concerns of security, privacy of information and technology investment cost. Also the literature indicates that according to the customers there are different factors that influencing the adoption of E-banking such as, perceived advantages and other factors related to the services itself & how to be accepted and used by the customers, which differ from country to country, reflecting the economical and technological development in each country. In this study researcher has identified the main factors influencing adoption of E-banking in Ethiopian banking industries by using survey and interview conducted with managers of the selected banks.

3. Methods Adopted

In order to attain the objective of the study and answer the research questions; researcher adopts both quantitative and qualitative (Mixed) research approach. The rationale of using such a mixed approach is to gather data that could not be obtained by adopting a single method and for triangulation (Creswell 2003). The method of data collection techniques consists of Survey, interviews and document analysis. With regard to survey, questionnaire was distributed to the staff of the 4 purposely selected banks (one state owned bank and three private commercial banks) to identify their intension on the adoption of E-banking systems. The questionnaire was distributed to 160 employees, all staff of E-payment or IT department of each bank was participated in the study. Interviews were conducted with the managers of the purposely sampled banks found in Addis Ababa and with one person (banking supervision department manager) at National Bank of Ethiopia (NBE). Collecting of data by using questionnaire and interview were supported by different documents obtained from records and reports of the industry, from web site, books, articles and Journals.

Finally the data obtained from survey were analyzed by using descriptive statistics, statistical package for social science (SPSS).

4. Finding

Although there are many associated benefits with the adoption of E-banking, there are many reasons which obstruct implementation of the system. In case of Ethiopian banking industries, many private banks still using old banking system and don't have access to take advantage from electronic banking facilities. Wondwossen & Tsegai (2005) observed the following reasons which may be considered as hindrance factors for the use of electronic payment system in Ethiopia. These hindrance factors include, lack of appropriate infrastructure for E-payment, lack of internet facilities with customer and learning how to interact with bank website. Moreover, factors that can affect adoption of E-banking in the country regarding the technological factor, organizational factor and Environmental factor were presented as follows.

Technological Factor

The issues raised in this study in relation with technological factor are the relative advantages (perceived benefit) the firm gained from adoption of E-banking system and the relative disadvantages (perceived risk) which hinder banking industries from the adoption of new technological innovations.

Perceived Risk

One of the basic barrier a firm faces, while adopting technological innovation is the perceived risks. For example the study of Sohail and Shanmugham (2003) suggests that one of the barriers in the adoption of electronic banking is fear of security risks.

Moreover, all of the bank manager's participated in this study were asked whether security issue is raised with the use of technological facility in the banking industries, and all of them stated that security is the main concern that hinders our bank to use technological facilities. These were also supported by the survey result shown on table 5.1, as follows.

Table 5:1, Technological Factor

	Customers fear risk to use ATM	Lack of confidence with the security	In the case of using mobile banking, ATM and others, security risk affect users decision to use the system	Customers do not trust the technology provided by banks	Lack of trust is considered as barriers for the adoption of E-banking system. Ethiopia.
Valid	126	126	126	126	126
Missing	0	0	0	0	0
Median	2.0000	2.0000	2.0000	3.0000	2.0000
Mode	2.00	2.00	2.00	2.00	2.00

Note: N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4-Disagree and 5-Strongly disagree.

Source: survey result, 2012

The result presented in the above table shows that, the respondents asked whether customers of banks fear risk to use ATM, and the descriptive statistics result gives median and mode of 2.00, that means the largest number of respondent were agreed on the issue, therefore fear of risk is one of the factor that hinder adoption of E-banking system in the country. Similarly the result shown on the above table revealed that lack of confidence with the security issue is considered as barrier for the adoption E-banking system, were median and mode value for the second question is 2.00. This result were consistent with the findings of Ghazi and Khalid (2012, p.9); Khalfan *et al* (2006) in which all indicted that, technological barriers, such as security risk as hindrance factor for the adoption of E-banking.

Also the result shown on the above table indicated that lack of trust on the use of technological facility provided by bank is another factor that can hinder adoption of technological innovation by Ethiopian banking industries. This result confirms the finding of Sathye (1999) which suggests; the greatest challenge among the electronic banking sector is winning the trust of customers in the issue of security or perceived security risk as a key inhibitor in the adoption of online banking.

Organizational Factor

One of the basic issue related with organizational factor is, the availability of financial as well skilled human resource to implement the system. In this study costs related with the use of E-banking instrument and technical or managerial skills required to implement E-banking system were considered as organizational factors.

As it is shown in the following table 5.2, regarding the cost incurred on the use of different E-banking system like internet/online banking and mobile banking the largest number of respondents 51 out of the total or 40% did not agreed with the idea. Similarly the descriptive statistics result shows that, median and mode value for the first two questions in the table is 4.00.

On the other hand the result presented on table 5.2. Blow revealed that unfamiliarity with the service provided though ATM, Internet banking, telephone and mobile phone by customers, Lack of technical and managerial skills on the use of technological innovation and Lack of skills to implement E-banking system are considered as barriers for the adoption of E-banking system.

Table 5.2. Organizational Factor

	Using internet banking increases cost to do banking task	Relatively using of Mobile to get banking service is expensive for customers	Customers of our bank were not familiar with service provided though ATM, Internet banking, telephone and mobile phone	Lack of technical and managerial skills on the use of technological innovation.	Lack of skills to implement E-banking system
N Valid	126	126	126	126	126
Missing	0	0	0	0	0
Median	4.0000	4.0000	3.0000	2.0000	3.0000
Mode	4.00	4.00	2.00	2.00	2.00

Note: N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4-Disagree and 5-strongly disagree

Source: survey result, 2012

The above results were also supported by an interview script received from all respondents, which indicated that, ‘compared with traditional banking system, using different technological innovation in banking industry is used to perform banking activities at lower costs. This finding is consistent with the finding of Rasoulina & Javaheri (2006) which suggests, cost, infrastructure, Socio-cultural, time, information, legislation and regulation and economic as the most effective issues affecting the electronic activities. These issues can be either drivers or barriers. For instance, if a country has managed to achieve a cost reduction greater than the investment made in adoption of new technology, then the cost factor can be considered as a driver rather than as barrier.

In general, using of E-banking service such as internet banking, mobile banking and others is not expensive when compared with traditional banking system. On the other hand lack of social awareness/lack of familiarity with different technology and lack of sufficient skills to use and implement E-banking system were considered as barriers to adopt E-banking system in Ethiopia.

Environmental Factor

Another factor which can affect the adoption of technological innovation in banking industry is an external environment: in this study four basic environmental factors are considered, these are legal frame works, national ICT infrastructure, competitive pressure and government support. The result obtained from survey, interview and literature regarding those four issues were presented in the following sections.

Lack of Legal and Regulatory Framework

Electronic payments are not currently covered in Ethiopian legal system. Lack of such legal framework may thus hinder the introduction of cost effective modern electronic payment instrument such as ATMs, credit and debit cards, mobile/telephone/internet banking.

Other policy initiative which is currently under consideration is the development of securities market, particularly, that of long term debt instruments (Getahun 2008). Similarly the study of Gardachew (2010) revealed that lack of legal frame work is one of the challenges for E-banking system in Ethiopia. In contrary the study of Wondwossen and Tsegai (2005) revealed that an adequate legal structure and security framework could encourage the use of E-payments in Ethiopia. However, the result of survey presented in table 5.3 about legal frame work on implementation of E-banking system revealed that lack of legal frame works and cross country legal and regulatory difference is considered as barriers faced by banking industries for the adoption of E-banking system in Ethiopia.

Table 5.3.Environmental Factor(Lack of Legal and Regulatory Frame Work)

	Lack of legal frame works that enforce banking industries to adopt technological innovation	Cross-country legal and regulatory differences will have impact on the adoption of new technological innovation in the banking sector like, ATM, internet banking, mobile banking and Point of sale terminals (POS).
Valid	126	126
Missing	0	0
Median	2.0000	2.0000
Mode	2.00	2.00

Note: N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4-Disagree and 5-strongly disagree

Source: Survey result, 2012

Results reported on table 5.3, shows that the median and mode value for the first questions were 2.00, which means, the largest number of respondents 42 or 33% out of the total respondents were agreed that there is no legal frame works in Ethiopia. Likewise, the median and mode value for the second question in the above table were 2.00, largest number of respondents 67 or 53% were agreed that the differences on banking regulation in different country will have impact on the adoption of new technological innovation. Similarly, An interview conducted with one of the bank supervision manager at national bank of Ethiopia (NBE) also prove that, Ethiopia does not have special rule on the use of E-banking system or it is not yet included in the banking regulation. Since there is no legal frame works on the adoption of technological innovation at central bank, Ethiopian banking industry can not be enforced to implement E-banking system. So lack of legal frame work for the implementation of E-banking system is one basic barrier for Ethiopian banking industry. The finding of this study were also consistent with the study of Tan and Ouyang (2002), they found that lack of legislation is an initial barrier that influence E-banking adoption in china.

Lack of Adequate ICT Infrastructure

Despite the recent improvements made by Ethiopian government on the national infrastructure, the overall ICT infrastructure in Ethiopia remains inadequate. Card-based payment systems in Ethiopia have been growing fast in recent years. Four commercial banks in the country (including the state owned Commercial Bank of Ethiopia), Dashen bank, Zemen bank and Wegagen bank have introduced wider use of debit or ATM cards. Commercial banks in Ethiopia also cited plans to use new technologies for remittance transfers, including mobile-phone transfers and remittance-linked financial products such as prepaid cards.

However, significant challenges to these plans include, lack of adequate financial and telecommunications infrastructure for the new technologies (Alemayehu & Jacqueline 2011). Similarly the study of Wondwossen and Tsegai (2005) stated that lack of sufficient telecommunication infrastructure is one of the basic challenges in the development of E-payment in Ethiopia. More over the questionnaire result in this study presents four questions to examine the perception of bank staff on the issue.

Table 5.4.Environmental Factor(Lack of Adequate ICT Infrastructure)

	Using internet banking is difficult due to low internet access in Ethiopia	Internet connection was not good enough to perform online transactions in Ethiopia	Lack of available ICT infrastructure	Mobile banking services may not perform well because of network problems
N Valid	126	126	126	126
Missing	0	0	0	0
Median	2.0000	2.0000	2.0000	2.0000
Mode	2.00	2.00	2.00	2.00

Note: N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4-Disagree and 5-strongly disagree

Source: Survey result, 2012

The above table 5.4 shows that ICT infrastructure in Ethiopia for internet access is not sufficient to use online banking service, were the median and mode value for the first question is 2.00. Similarly the median and mode value of the rest three questions is 2.00, which indicated that lack of available ICT infrastructure in the country inhibits to use E-banking system. Similarly, an interview script received from the CBE E-payment manager indicates that ‘the poor quality of telecommunication network service is a major obstacle for all banks in Ethiopia to effectively deliver some services such as internet banking, mobile banking and others.

Moreover, the IT manager of Zemen bank, indicated that: ‘Our bank were aggressively doing on the provision of high quality service to customers by employing different technological innovation, for example the bank purchase CORE banking system soft ware, which offers service to customers more than the sophisticated ATM machine. It would enable banks to provide Internet banking to deliver product/service to customers. It helps customers to view their balances, transfer funds, and pay bills online. Banks could also offer mobile banking services through which customers can check their balance and transfer funds by short message service (SMS), as well as phone banking to check balances and make account inquires by phone. However, some experts in the banking industry speculate that underdeveloped telecommunications infrastructure may hinder the visibility and practicality of the CORE banking system.

Therefore, one of the major obstacle factor identified in this study is lack of ICT infrastructure, to use E-banking service, such as internet banking, mobile banking, ATM and others.

Lack of Competition

As it is stated in different E-banking literature, competitive pressure is considered as driver for the adoption of E-banking in developed country.

For example, the study of Laforet & Lu (2005) and Salwani (2009) suggests that, the foreign funded banks are more competitive in securing corporate clients over the Chinese banks because they are perceived to offer better services and more stringent security measures given their longer experience in E-banking development. However, lack of competition in Ethiopia among local and foreign bank hinders Ethiopian banking industries to adopt E-banking system. Respondents were asked whether lack of competition among local and foreign banks influence adoption of E-banking and the result obtained from survey is shown on the following table.

Table 5.5.Environmental Factor(Lack of Competition)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	20	15.9	15.9	15.9
	Agree	59	46.8	46.8	62.7
	Neutral	13	10.3	10.3	73.0
	Disagree	29	23.0	23.0	96.0
	Strongly disagree	5	4.0	4.0	100.0
Total		126	100.0	100.0	

Note: N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4-Disagree and 5-strongly disagree.

Source: Survey result, 2012

The above table 5.5 shows that the largest number of respondents 59 or 46.8%, were agreed with the idea that lack of competition between Ethiopian banking sector and foreign bank is considered as barrier for the adoption of E-banking system. Similarly, an interview result revealed that, Ethiopian government did not allow foreign banks to operate in the country, these is due to protecting of local banks from the well developed foreign bank competition. Therefore, Ethiopian banking industry did not consider about competition with foreign banks and such policies could discourage banking sector of the country from the adoption of E-banking system.

Government Support

In addition to the competitive pressure, the study of Chong and Pervan's (2007) survey of Australian SME suggest that, government initiatives are the most significant factor determining the extent and deployment of E-business adoption. Similarly the study of Sherah *et al* (2009) noted that government support is the major driver for the adoption of E-banking in china. The questionnaire result about government support was shown on table 5.6 as follows.

Table 5.6, Environmental Factor (Government Support)

	Lack of sufficient government support will affect customers willingness to use technological innovation	Customers may not willing to accept E-banking service
Valid	126	126
Missing	0	0
Median	3.0000	4.0000
Mode	4.00	4.00

Note: N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4-Disagree and 5-strongly disagree

Source: survey result, 2012

As it is depicted on the above table, respondents were asked whether, lack of government support is an inhabiting factor for the adoption of E-banking in Ethiopia and the median and mode value gives 3.00 and 4.00 respectively. by looking the mode value of 4.00, it is possible to say that the largest number of respondents did not agreed with the idea that lack of government support affect adoption of E-banking system in Ethiopia. For the second question the median and mode value is 4.00, it implies that unwillingness of customers to accept E-banking system is not considered as barrier for the adoption of technological innovation.

On the other hand an interview conducted with IT managers /E-payment managers confirms that, Ethiopian government were doing on improvement of national infrastructure, it will encourage our bank to adopt different technological innovation.

5. Conclusion

This study aims at investigating the main factors affecting adoption of E-banking in Ethiopia. To achieve the proposed objective Technology-organization-Environment (TOE) frame work were used. On the other hand both quantitative as well as qualitative (mixed) research approach was employed in the study.

E-banking system, such as ATM, mobile banking, internet banking and others were not well adopted by Ethiopian banking industry. This is due to low level of ICT infrastructure and lack of legal frame works at NBE, which can initiate banking industry to implement the system. In addition to the above two basic factors affecting adoption of E-banking in Ethiopia, Result of the study also shows that security risk and lack of trust on the use of technological adoption are other major barriers for the system. The level of security risk associated with E-banking product or service, such as ATM, internet banking, mobile banking and others, pose different challenges to different banks. Improvements are required to ensure client confidence. Lack of competition among local and foreign banks is also another challenge for the adoption of E-banking in the country.

Technical and managerial skills available in Ethiopian banks for the adoption of E-banking are also limited. This is influencing the choice of technology in Ethiopian banks.

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 barriers to 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.

Therefore, *Ethiopian government should establish a clear set of legal frame work on the use of technology in banking industry, support banking industry by investing on ICT infrastructure and banks needs to be focused on technological innovation competition rather than traditional bases of retail bank competition.*

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Banking industry is one of the critical economic institutions in the economic development of a country. However, the majority of Ethiopians do not have access to the banking services. Even most of the existing banks operate in cities and towns where significant customers exist to secure financial viability since all commercial banks operate for profit. According to the library and internet search I conducted about mobile banking adoption in Ethiopia, except some researches in the general electronic banking in Ethiopia (senait, 2007) to identify the challenges of e-banking, I could not find research work conducted specifically with regard to mobile banking. The banking industry of most developed and developing countries have started to offer electronic banking services to improve the effectiveness of distribution channels through reducing the transaction cost and increasing the speed of services. The adoption of electronic banking services from Ethiopian bank customers perspective is still low; most bank customers continue to conduct most of their banking transactions using traditional methods [12]. Studies related to the factors that affect customers e-banking usage behavior have been at the forefront of several research works in the developed and developing countries. Thus, the main objective of this paper is to examine the impact of demographic factors on users e-banking adoption behavior in Ethiopia. E-banking is the most recent delivery channel of banking services in developing nations. The objectives of the paper is tried to address the challenges in E-banking Services and its impact on the profitability of the Public Sector Bank in Ethiopia particularly Commercial Bank of Ethiopia (CBE) before and after introduction of e-banking services. The Internet and Telecommunication systems, enables the development of electronic commerce at a global level. The nearly universal connectivity which the Internet offers has made it an invaluable business tool. of e-banking and its challenge and opportunities in Ethiopian banking industry (i.e Ayana G. (2010) on adoption. of E-banking in Ethiopia; Barriers and Drivers; Gardachew Worku (2010) on electronic banking in Ethiopia