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St. Mary's University, Ethiopia

School of Graduate Studies

DETERMINANTS OF DIGITAL BANKING ADOPTION IN CASE OF FIVE SELECTED COMMERCIAL BANKS IN ETHIOPIA

(COMPANY SIDE ANALYSIS)

Research Submitted to St. Mary's University School of Graduate Studies Master of Business Administration (MBA) Program in Partial Fulfillment for the Requirements for the Degree of Mater of Art (MA)

By Kebadu Muluken

St. Mary's University

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JANUARY, 2023

ADDIS ABABA, ETHIOPIA

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DECLARATION

I hereby declare that the thesis entitled "Determinants of digital banking adoption in five selected commercial banks in Ethiopia: is my original work, prepared under the guidance of Temesgen Belayneh (PHD, MBA. MA, Assistant Professor) **.**All sources of materials used for the thesis have been duly acknowledged moreover, this study has not been submitted for the award to any other higher learning institution for the purpose of earning any degree.

Declared by Kebadu Muluken confirmed by Advisor

Signature: _____ Signature: _____

Date: JANUARY, 2023

ENDORSEMENT

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

_____ _____

Advisor Signature & Date

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Abstract

Many bank customers are still reluctant to conduct their financial transactions online. The aim of this paper is to provide an improved understanding of factors affecting adoption of digital banking in Ethiopia banking industry. The research adopted descriptive and exploratory research design with mixed research approach. Stratified sampling and simple random sampling techniques were employed for this research with 339 sample size. Both primary and secondary data that were collected through questionnaires, interview and document review. Descriptive statistics, correlation analysis, linear regression analyze techniques were used to analysis the data. The study shown the following major determinants of adoption digital banking services among commercial banks in Ethiopia; technological factors, organizational factor, human and financial resources, environmental factors, national ICT infrastructure, lack of legal and regulatory frame work, lack of government support and lack of competition from foreign banks, from demographical factors, gender, age and education level, and finally lack of awareness The study recommended banks to give continues awareness and learning about their digital banking services and focus on technology based competition focusing on customer base expansion, credibility, security, ease of use, and availability to tackle challenges as well as to seize the opportunities offered by digital technology while the government should support banking sector by facilitating sufficient ICT infrastructure development and issue workable legal frameworks to ease the adoption of digital banking service.

Keywords: *Banking industry, Adoption of Digital Banking, Fintech*

List of Acronyms

AB	Awash bank
BOA	Bank of Abyssinia
ANOVA	Analysis of Variance
ATM	Automated Teller Machine
ITM	Interactive Teller Machine
CBE	Commercial Bank of Ethiopia
DB	Dashen bank
E-banking	Electronic Banking
E-commerce	Electronic Commerce
ECX	Ethiopian Commodity Exchange
EFT	Electronic Fund Transfer
E-payment	Electronic Payment
GSM	Global System for Mobile Communication
ICT	Information and Communication Technology
IT	Information Technology
NBE	National Bank of Ethiopia
PC	Personal Computer
POS	Point of Sale
S.C	Share Company
SMS	Short Messaging Service
SPSS	Statistical Package for Social Scientists
TAM	Technology Acceptance Model
TOE	Technology-Organization-Environment
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
DOI	Diffusion of Innovation
ZB	Zemen Bank

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UNIT ONE

1. INTRODUCTION

1.1. Background of the study

For many years, retail banks have been secure, highly profitable businesses. However, recent industry disruption has come knocking at the door of these financial giants. The turning point was the global financial crisis experienced between the years 2007–2009, which not only led to large losses, and even the collapse of a significant number of established banks but shook the trust of financial customers worldwide. These factors, combined with the fact that banking has been relatively undisturbed for centuries, meant it was time for change, and that change has been the rapid rise of financial technology companies, or fintech. (Edwin Carlson)

Emergent innovative financial technologies are profoundly changing the ways in which we spend, move, and manage our money unlike ever before. The digital transformation and its pace of change have been truly astounding, dramatically shifting customer behaviors and expectations of their financial service providers. Retail banks must now become positioned to fulfill their customers' every financial need, especially as the Millennial generation (those born between the early 1980s and early 2000s) is poised to command the most purchasing power of any age group. Banks will need to become more cognizant of this generation for a multitude of reasons. Research undertaken by the Cassandra Report1 into how Millennia's conduct their financial services has shown a defined trend in that they typically do not have the same legacy relationship with their banks as older generations had. The research indicates that Millennia's judge banks based on their digital capabilities and will not hesitate to switch their bank account to another provider if they consider it to offer a better banking service. (Edwin Carlson)

Banks have always fought to gain absolute power and market share, knowing their competition, and serving a marketplace that had relatively few alternative choices. However, the battlefield is changing as financial technology advances and new players emerge. Today, financial customers have become restless, demanding more from their financial service providers than ever before. Many retail banks around the world have now reached a pivotal moment in their history, and they need to transform through financial technological advancements to stay relevant or risk the possibility that agile financial start-ups could confine them to a limited utility role. This

challenge comes at an inopportune time for retail banks just as industry profitability is stagnating and customer loyalty is becoming even more tenuous (Wewege & Thomsett, 2019).

In order to provide efficient and effective services, Banks currently uses latest technology, financial resource and human resources to achieve its predetermined goals and objectives. Among those resources, technology is one of a competitive advantage for the banking industry to ease delivery of the intended service, to make timely decision, exploit resources user friendly, achieve the objectives of the organization as planned and contribute for the enhancement of the overall development (Abebe Zeleke ,2016). In rapidly changing and highly competitive environment success in the banking industry especially depends on having use of the appropriate technology along with retention of well trained and motivated employees who have the capacity to exploit the Bank's existing technology as well as look for better advancement(Abebe Zeleke ,2016).

In today's digital world, winning and retaining customer's hinges on creating value to enhance convenience and quality beyond mere financial transactions. This marketing strategy is embraced by major digital players such as Apple, Amazon, Alibaba, and Google. For retail banks, this requires a dramatic shift in strategic focus from being a provider of financial products and services to becoming a provider of solutions. Banks cannot respond to these threats by simply being more technologically advanced or reducing the number of branches they operate, but by rolling out better mobile and online banking services. (Wewege & Thomsett, 2019)

Information and communications technologies (ICTs) have changed the way of conducting business transactions and meeting the growing demands of customers for most organizations. The promise of ICTs in the banking sector has been seen in terms of its potential to increase customer base, reduce transaction costs, improve the quality and timeliness of response, enhance opportunities for advertising and branding, facilitate self-service and service customization, and improve customer communication and relationship.

The banking industry is constantly responding to changes in customer preferences and needs, increasing competition from non-banks, changes in demographic and social trends, information technology advances, channel strategies, and government deregulations of the financial service sector (Byers & Lederer, 2001).

The rapidly growing information and communication technology is knocking the front door of every bank in the world, where Ethiopian banks would never be exceptional. Electronic Banking has been widely used in developed countries and is rapidly expanding in developing countries. In Ethiopia electronic payment systems are at an evolving stage. In the face of rapid expansion of electronic payment systems throughout the developed and the developing world, Ethiopia's financial sector cannot remain an exception in expanding the use of the electronic banking. In this context, the study would attempt to trace the factors affecting E- banking.

1.2. Background history of E-banking in Ethiopia

The appearance of digital banking in Ethiopia goes back to the late 2001, when the largest state owned, commercial bank of Ethiopia (CBE) introduced the service for local users with its eight ATMs located in Addis Ababa (Gardachew, 2010), and 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 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. This would make Dashen Bank the first private bank in Ethiopia to acquire E-commerce and mobile merchant transactions (Amanyehun 2011). Although Dashen new technology is one step ahead in that it allows transfer of funds from one 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)

United Bank S.C is the first to introduce tele-banking - including text messages or SMS by the end of 2008. Currently, United Bank is starting to deliver E banking services like ATM, internet, mobile and agent banking. (United Bank SC web report, 2015)

Wegagen Bank is introducing a Core Banking System as of July 2000 that helps to connect its Head Office & all branches through a network. Through its versatile ISO Standard Core Banking System, the Bank is now delivering more efficient services to its customers. The system has also enabled the Bank to provide technology-based banking services such as Card payment services (through ATM & POS), internet banking as well as mobile banking services. (Wegagen Bank SC Web report, 2015) Zemen Bank has launched prepaid bank cards which can be used without opening a deposit account at the bank. The cards will have preloaded funds, which can be withdrawn from ATMs or used to make purchases from POS terminal. The prepaid cards will be given to the cardholders with a PIN to withdraw the cash. The prepaid cards can be used as gift cards or employee salary or expense cards, which can avoid the need to carry around a large amount of cash. The cards can be preloaded with a minimum of 100 Br. And a maximum of 50,000.00 Br. and reloaded after the previous funds have been fully utilized. The bank will take a commission each time a card is loaded (Fortune, 2012).

Bank of Abyssinia introduce interactive teller machine (ITM) and launch virtual banking center in 2020 where the banks customer be able to conduct most banking service through video conferencing with the banks experienced customer advisors working at the center so that without being required to go to physical branches customer using the interactive teller machine (ITM) at the center would be able to get the banking service for seven days a week for 24 hours. ITM provide new account opening, cash deposit and withdrawal, cheque cashing and deposit, local money transfer, account to account transfer, foreign exchange, subscribing for digital banking service like mobile banking, card banking, internet banking and mobile money and bill payment. (Bank of Abyssinia Web report, 2021)

Currently, there are only a few agreements in place to share ATM resources. The first was the Premium Switch Solutions (PSS), which was established by three banks in 2009 namely Awash International Bank S.C., Nib International Bank S.C and United Bank S.C., with a capital of 165 million Br, and now has six member banks, including Awash International Bank S.C., United Bank S.C., Nib International Bank S.C., Berhan International Bank S.C., Addis International Bank S.C and the Cooperative Bank of Oromia S.C. It is the first certified Third-Party Payment

Processor by the regulatory party, National Bank of Ethiopia and starts its operations in July 2012. Moreover, PSS has made its system certified by VISA, Master Card and Union pay. Hence, members connected to PSS network can issue and acquire cards with these brands. Per the plan of PSS, 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 (Gardachew, 2010).Now in 2021 ET switch which was monitored by National Bank of Ethiopia enable all bank to share ATM resource and this is good opportunity to increase the accessibility of ATM to customer.

1.3. Statement of the problem

The digital banks today have access to more information about customers than brick and mortar banks ever had in the past. Simply stated, this is a profound competitive advantage. Beyond these market advantages, digital banking will employ robotics and AI to further reduce costs and create even more market advantages. The combined capabilities under this model include analysis of emotional intelligence, logical reasoning, self-supervised learning and training, and pattern recognition that no bank teller will ever be able to duplicate. Infrastructure will also be remodeled and become dominant, through cloud-based processing.

The number of commercial banks in Ethiopia has reached 22, out of which 20 are private, and the remaining 2 state-owned and there are 4 private banks which are officially established to provide banking service and are working their back-office activities to start the operation and also there are more than 10 private banks under establishment which will makes the total number of banks more than double.

The total Branch network in the country reached 7,344 of which 34.5% of branches were located in Addis Ababa. As a result, one bank branch serves 14,000 people in Addis Ababa (NBE annual report, 2020/21). Moreover, the current numbers of population of Ethiopian reached more than 110 million of which 80 percent are living in rural areas where financial institutions have not yet reached to majority of those people. According to NBE 2020/21 annual report, by the year end 2020/21 the total number of Ethio telecom subscribers has reached 56.2 million in 2020/21 depicting a 21.9 percent annual expansion a owing to a 22 percent rise in mobile voice and 52.3

percent increase in internet & data subscribers despite a 6.8 percent decline in fixed voice service subscribers.

The absence of formal banking to the population who live under low-income category makes them vulnerable to traditional modes of parking their savings in land, buildings, bullions, etc. which in turns has its own regressing effect towards capital formation in the Country. Besides, such a population is exposed to the informal channels of credit like family, friends and moneylenders as a result of which entrepreneurial spirit of the masses to increase outputs and prosperity in the countryside would be compromised. Last but not least, a considerable amount of money that is meant to the poor does not actually reach the intended parties as it passes through a large system of government bureaucracy and is exposed to money leakage. Even though E-banking have a lot of benefit in delivering service to customers, in Ethiopia customers were missed to enjoy with the technological advancement in banking sector which has been entertained elsewhere in Africa and the rest of the world. This is due to lack of awareness or competition among the banking industries. The modern E-banking methods like ATMs, Debit cards, Credit cards, Tele banking, Internet banking and Mobile banking are at the infant stage in Ethiopian banking sectors. E-banking which refers to the use of modern technology that allows customers to access banking services electronically whether it is to withdraw cash, transfer funds, and to pay bills, or to obtain commercial information and advice are not well known in Ethiopia (Ayana, 2012).

Considering the low extent of development of ICT infrastructure in developing countries, when compared with the developed countries digital banking has not really been able to diffuse into society given the low rate of internet access (Banji & Catherine 2004). These phenomena have a large effect on e- banking diffusion and lead the population unbanked.

The banking industry in Ethiopia is underdeveloped and therefore, there is an all immediate need to embark on capacity building arrangements and modernize the banking system by employing the state of the art of technology being used anywhere in the world. (Gardachew 2010)

In order to encourage further digital banking adoption in developing countries, a better understanding of the barriers and drivers impacting digital banking adoption is critical (Zhao, 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 digital banking in the developing countries.

Even though there is a beginning in adopting digital banking in Ethiopia it is common to see the crowed of customer in physical branches and lot of customers are still un banked and put their money in traditional way like burying in their house, giving to other person as safe keeping etc. and this practice affects our country economy significantly so this study will assess the determinants of Digital Banking adoption in Ethiopian Banking industry based on the research problems discussed above.

1.4. Research questions

The research has the following sub research questions.

1. To what extent technological factors affect the adoption of digital banking?
2. To what extent do environmental factors affect the adoption of digital banking?
3. To what extent an organizational factor affects the adoption of digital banking?
4. To what extent does lack of awareness affect the adoption of digital banking?
5. To what extent do demographic factors affect the adoption of digital banking?

1.5. Hypothesis

The researcher have the following hypothesis

1. There is a relationship between lack of awareness and adoption of digital banking.
2. There is a relationship between environmental factors and the adoption of digital banking.
3. There is a relationship between organizational factors and the adoption of digital banking.
4. There is a relationship between technological factors and the adoption of digital banking.
5. There is a relationship between demographical factors and the adoption of digital banking

1.6. Aim and Objectives of the study

1.6.1. Aim of the study

The aim of this study is to explore the determinants of digital banking adoption in Ethiopia banking industry.

1.6.2. Objectives of the study

Specific objectives of the study would be.

1. To explore the influence of technological factors on the adoption of digital banking and service among commercial banks customer in Ethiopia.
2. To explore the influence of environmental factors on the adoption of digital banking service among commercial banks customer in Ethiopia.
3. To explore the influence of organizational factors on the adoption of digital banking service among commercial banks customer in Ethiopia.
4. To explore the influence of lack of awareness on the adoption of digital banking service among commercial banks customer in Ethiopia.
5. To explore the influence of demographic factors on the adoption of digital banking service among commercial banks customer in Ethiopia.

1.7. Significance of the study

The outcomes and results of this research would have potential value to financial institutions, particularly banks management and employees and National Bank of Ethiopia to identify challenging factors that hinder the adoption of digital banking in order to increase the use of service as well as to encourage the general acceptance of new IT services and to monitor the development and growth of digital banking .In addition, this study expected to help other researchers who will be interested to conduct further study regarding the issue under investigated by providing use full information. Finally based on the factors found to be influencing bankers' decision on digital banking system, the study will provide recommendations for banks about changes needed to accelerate the practice of the system to deliver service to customers through technological innovation.

1.8. Scope of the study

The study was focused to investigate the major determinants of digital banking adoption in Ethiopia banking industry. The study was limited to select five commercial banks namely commercial bank of Ethiopia, Zemen Bank, Bank of Abyssinia, Dashen bank, and Awash bank digital banking department that are located only in Addis Ababa and excluded other banks, other financial institutions other than bank, banks department located out of Addis Ababa & out of digital banking department . The reasons for this are Ethiopia is too large for the researcher to

travel all over the country. From the total population five banks are selected based on banks that are partly implemented digital banking.

There are many determinants of digital banking adoption. But I would try to see the following factors only and other factors will be excluded. From technological factors perceived benefits and perceived risks, from environmental factors legal frame work, national ICT infrastructure, competitive pressure and government support, from organizational factors, financial and human recourses, from demographic factors gender, age, and educational level.

1.9. Limitation of the study

While conducting this study I used nonprobability sampling technique and it have its own drawbacks like Unknown proportion of the entire population will not include in the sample group i.e. lack of representation of the entire population, Lower level of generalization of research findings compared to probability sampling and Difficulties in estimating sampling variability and identifying possible bias. Hence the generalizations may not be applicable to them. However, in order to get a more reliable representation, respondents will be gathered from five banks digital banking employees and managers that use and work to expand digital banking.

1.10. Organization of the paper

The research paper is divided into five units. Unit one presents the introduction part, which contains, back ground of the study, statement of the problem, research questions, objectives of the study, research method adopted, scope & limitations of the study and significance of the research paper. Unit two presents the literature review, unit three presents research methodology, the research results and discussion is presented in unit four. The final part, unit five will summarizes the findings, concludes the paper, and forwards some recommendations.

1.11. Definition of operational terms

1. **Electronic 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).

2. **Digital Banking:** high level of process automation and web-based service and may include Apps enabling cross institutional service composition to deliver banking product and transaction

3. **Internet banking:** refers to systems that enable bank customers to access accounts and general information on bank products and services through a personal computer (PC) or another intelligent device (Booz & Hamilton, 1997).
4. **ATM:** It is a machine where cash withdrawal can be made over the machine without going in to the banking hall. It also sells recharge cards and transfer funds; it can be accessed 24 hours/7 days with account balance enquiry (Fenuga & Oladejo, 2010).
5. **Adoption** is the acceptance and continued use of a product, service, or idea. Consumers go through a process of knowledge, persuasion, decision, implementation, and confirmation before they are ready to adopt a product or services (Rogers & Shoemaker, 1971).
6. **Mobile banking** means performing banking activities which primarily consist of opening and maintaining mobile/regular accounts and accepting deposits; furthermore, it includes performing fund transfer or cash-in and cash-out services using mobile devices (NBE Directive, FIS-01-2012).
7. **POS:** A Point-of-Sale service is an electronic payment type that allows credit/debit cardholders to make payments at sales/purchase outlets. It allows customers to perform the following services: Retail Payments, Cashless Payments, Cash Back Balance Inquiry, Airtime Transaction, Printing mini statement etc. (Kumaga, 2010).
8. **Credit Card:** Credit Card can be called as an equivalent of a loan sanctioned by the bank to its customers. Credit card facilitates and makes it possible to "Use First and Pay Later" the specified amount of credit as per the agreed terms of sanction (Fenuga & Oladejo, 2010).
9. **Virtual Banking**: is the provision of accessing the **banking** and related services online without actually going to the bank branch/office in person. Simply, availing the banking services through an extensive use of information technology without any requirement for the physical walk-in premises. It combines the best aspects of self-service in mobile channels and direct **"**at the window**"** service**.** This is a new channel of communication

with the client**.** The client contacts the bank employee virtually**,** through video**,** audio, and chat channels**,** while maintaining the direct contact option.

10. **Interactive Teller Machine (ITM):** are a teller machine Like ATM interface but with the enhancement of a video screen that allows customers to speak directly to a service representative in a call center in real time.it also called video remote teller. (NCR)

UNIT TWO

2. REVIEW OF RELATED LITERATURE

2.1. Theoretical Review

2.1.1. Types of E-banking /Digital Banking

E-banking can define 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). According to Alghaeband, there are different types of E-banking and some of the basic are discussed as follow:

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 purchases 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 the 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 short text message (SMS).

2.1.2. Benefits of Electronic

Electronic banking services are becoming the preferred way of making transactions in the developed world due to the fact that they understand the benefits very well through long years of

using them in their economy (Dawd, 2004). The benefits of having an electronic banking system can be seen from different perspectives as follows.

A. Benefits to Customers

E-Banking offers substantial advantages to customers in the form of convenience, time saving and easy access to the banking services. The customers can transact their account at anytime and anywhere throughout the country or outside the country. There is no time and place restriction. The customers need not visit a branch for each and every transaction and there is no need to wait in the long queue. By this way they can save time. The customers can avail 24 hours a day and 7 days a week access to banking services anywhere. With the help of e-banking, easy access to the banks will be another advantage to the customers.

Thus, the e-banking provides sophisticated services to the customers (Devamohan, 2002). Dawd (2004) also argued that cardholders can be benefited from the safe and convenient nature of using cards for payment. Moreover, payment cards can make life easy for people who want to travel abroad as they minimize the volume of cash one needs to carry and the associated risk of theft. From merchants' point of view, those merchants who accept cards enable them to increase their sales as card holders prefer merchants who can accept their card for payment. Moreover, by reducing the amount of cash on hand, merchants can manage to reduce risks as well as costs related to cash management.

B. Benefits to Banks

The first benefits for the banks offering electronic banking services are better branding and better responsiveness to the market. In this competitive world, E-banking helps the banks to attract a greater number of customers and tackle the competition from other banks. According to Olga (2003), those banks that would offer such services would be perceived as leaders in technology implementation. Therefore, those banks that provide the service can enhance customer satisfaction through sophisticated services.

By providing secure e-Banking services, the banks can also avoid fraudulent activities. With the help of e-banking, banks can save time and hence they can increase the number of transactions and business (Devamohan, 2002). The other benefits of e-banking are possible to measure in monetary terms. The main goal of every company is to maximize profits for its owners and

banks are not an exception. In this regard, automated e-banking services offer a perfect opportunity for maximizing profits (Olga, 2003).

C. Benefits to the Economy

As e-banking provides an opportunity to the banking sector to enlarge their customer base, it has a consequence to increase the volume of credit creation which in turn results in better economic condition. The positive impacts of electronic banking are immense for the economic development of a nation. Some of the economic benefits of e-banking as identified by Dawd (2009) are as follow:

1. Reduction of the cost for printing cash notes and its related distribution

In a cash-based economy, governments are required to invest a great deal of funds on printing of cash notes and distributing same to the public. In the case of electronic payment systems, the transaction values are transferred from one account to another using electronic means, reducing the need for cash note distribution. Thus, by encouraging acceptance of payment cards, governments can achieve huge cost savings for their economy in terms of reducing cash note printing and related expenditure (Dawd, 2009).

2. Enhancement of Aggregate Deposit

When people start to increase the proportion of their saving compared to their daily consumption, the saved money can be utilized for investment purposes that in turn will create employment opportunities. This is a great benefit for the economy as a whole. However, individual savings could not bring this kind of impact. The benefit can only be obtained when savings are made in a banking system whereby the saved fund can be deployed to the economy in the form of loan to encourage the required investment (Dawd, 2009).

In an electronic payment card infrastructure people do not need to carry cash notes for their day-to-day expenditures as well as contingencies. They rather are encouraged to deposit their fund in the banking system and obtain a single plastic to access this fund at any time of the day when the need arises. This implies that unused funds are always in the banking system that helps to facilitate economic growth (Dawd 2009).

3. Banking the un-banked

While the electronic payment card infrastructure is diversified, payroll for employees can be handled through this system. Besides creating ease and convenience, both for the employer as well as the employee, it enables individuals to enter into the banking system which they may not be interested in otherwise (Dawd, 2009). Such impact of banking the unbanked population also has a benefit in increasing aggregate deposits as indicated above.

4. Increasing the potential for hard currency generation

Especially in developing economies, earning from hard currency is very essential to manage a country's balance of payment. The payment card system can bring a good potential of enabling economies to earn more foreign currency. This can be realized by attracting tourists and by encouraging them to spend more. In today's world, availability of payment card infrastructure is one of the criteria that tourists set while they decide which country to visit. As a result countries that maintain a developed electronic payment card system have a better potential of being visited by tourists than those which do not establish the infrastructure. Hence, more tourists and increased hard currency as a result of diversifying payment card business (Dawd, 2009).

Furthermore, due to the fact that travelers can access their account at home easily while staying in another country, where the payment card infrastructure is established, their chance of spending more is great. Travelers, being outside of their home country, feel more unsafe and uncomfortable carrying bulk amount of cash while on travel. Thus, they can be forced to spend only to the extent of the limited cash on hand during a certain period of stay in another country.

2.1.3. Challenges of Electronic Banking

Electronic banking despite its numerous benefits, there are challenges in the implementation of e-banking applications. Some of the identified challenges as revealed by previous research works include Technological factors, security, infrastructure, regulatory and legal issues, and Socio-Cultural challenges.

2.1.3.1. Technological factors

Successful electronic banking implementation requires effective technology management. The limited access to financial services is attributed to three main challenges: limited scale (outreach), depth and the high cost of providing financial services. Essentially, the provision of

financial services to many more people, especially in the depth of rural areas, using traditional branch networks entails high costs (Helms, 2006). In an attempt to overcome these challenges, financial service providers in a growing number of countries are finding innovative ways of delivering financial services. The use of ICT is indeed providing a means to increasing scale and depth, while reducing costs in the provision of financial services. Studies suggest that technology plays a significant role in improving financial access by taking financial services in a sustainable way to under-served and un-served areas (Stegman. Rocha, & Davis, 2005 Claessens, 2006). Studies also reveal that technologies such as ATMs, mobile phones and points-of-sale (POS) devices are increasingly being used to reduce costs and increase access for low-income clients (Ivatury, 2006). These technologies are providing alternative delivery channels for the delivery of financial services.

2.1.3.2. Security

One of the biggest challenges and the basic requirements of e-banking is ensuring its security. Securing the process in e-banking involves authenticating data of the customer and banker and protecting the information to be transmitted from interception. This authentication can be done using user ID and passwords. In addition, a means must be provided that prevent repudiation both by the merchant and customer once the payment process has taken place (Barnes and Hunt, 2001).

According to Worku (2010), e-banking systems must also take into account the need of multilateral security keys i.e. security needs of all participating parties in the e-banking system. An e-payment system that is not secured may not get trust from its users. Trust is one of the crucial factors to ensure the acceptance of e-banking systems by users. Martina (2005) also indicated that e-banking applications represent a security challenge as they highly depend on critical ICT systems that create vulnerabilities in financial institutions and businesses and potentially harm customers. It is imperative for banks to understand and address security concerns in order to leverage the potential of ICTs in delivering e-banking applications. Software failures can also be considered as security challenges as they destroy entire portions of a network and bring huge losses. According to Tadesse and Kidan (2005), some of the major security challenges include the following.

A. Disclosure of private information

In e-payment there are many ways in which private information may be accessed by attackers. For instance, hackers may intercept network traffic to get confidential data. It is also possible to access private data stored on a computer connected to the internet. This data could be used to make fraudulent transactions that could lead to a loss of money.

B. Counterfeiting

Counterfeiting is the creation of new data or duplication of existing data, which are technically valid but not legally admissible. Cloning e-money for double spending and creation of fake accounts are examples of counterfeiting. One popular form of counterfeiting attacks is duplication of electronic data from payment cards (e.g. ATM card) is creating duplicate cards and withdraw money from the accounts.

C. Illegal alteration of payment data

Illegal modification of payment information may result in loss of money. This may again result in the loss of customer confidence. Alterations could be made to the transaction account numbers resulting in misdirected payments, to the payment amounts or to electronic balances on electronic. Another challenge in e-payment includes usage of a fraudulent web site by an attacker to collect credit card numbers and other personal and/or financial information.

According to Taddesse and Kidan (2005), the most common method of securing e-banking services is using cryptographic based technologies such as encryption and digital signatures. However, applying these technologies will reduce its efficiency by making it slower and as a result some sort of compromising must be made between security and efficiency.

2.1.3.3. Infrastructure

The other challenge for the adoption of e- banking is proper infrastructure. For the effective deployment of e-banking, it is necessary to have a reliable and cost-effective infrastructure that can be accessible to the majority of the population.

The most common communication infrastructure for e-banking is computer networks such as the Internet. Most e-banking systems use the internet to communicate with their customers. The other communication infrastructure available for e-banking users is the mobile network used for mobile phones. Automating the banking activities is another prerequisite for e-banking system. A closed financial network that links banks and other financial institutions is necessary. This

network is usually used between banks or other financial institutions for clearing and payment confirmation.

According to Kumaga (2010), low level of internet penetration and poorly developed telecommunication infrastructure impede smooth development and improvements in e-commerce in developing countries. In this regard, a study made by Microfinance Nigeria (2010) indicated that efforts made by the Nigerian government and other financial and ICT stakeholders to move Nigeria's payment system from a cash-dependent platform to the globally acceptable electronic-driven alternative way is impeded by shortage of well-developed telecommunication infrastructure. Another major problem that relates to this is frequent electric power disruption. This will create a lot of problems in e-banking activities which are basically dependent on power supply. It will force the banks to depend on generators and results in high operational costs. These problems are considered as obstacles for the expansion of e-banking services.

2.1.3.4. Regulatory and Legal Issues

National, regional, or international sets of laws, rules, and other regulations are important prerequisites for successful implementation of e-banking services. Some of the main elements include rules on money laundering, supervision of commercial banks and money institutions by supervisory authorities, payment system oversight by central banks, consumer and data protection, cooperation, and competition issues (European Central Bank, 2002).

According to Mishra (2009), the virtual and global nature of e-payment also raises legal questions such as which jurisdiction will be competent and about applicable laws in disputed cases, validity of electronic data, electronic contracts, and electronic signature.

Moreover, a legal and regulatory framework that builds trust and confidence supporting technical efforts to meet the same is another important issue that needs to be addressed. In this regard legislative support is essential for protecting the interests of customers and banks in various areas relating to e-banking and payment systems. Some of the main issues like liability for loss in case of fraud, allocation of loss in case of insolvency, cheque truncation, evidence and burden of proof, preservation of records, prevention of fraud, etc. are to be cleared in the legislation (ECB, 2002). This can be done by adopting model laws at global level such as UNCITRAL Model law on E-commerce (1996), UNCITRAL Model law on E-signatures (2001) and at regional level such as the SADC Model law on Electronic Transaction and Data protection (Mishra, 2009).

2.1.3.5. Socio-Cultural Challenges

Cultural and historical differences in attitudes and the use of different forms of money (e.g. use of credit card in North America and use of debit cards in Europe) complicate the task of developing an electronic payment system that is applicable at international level. Difference in the degree of the required security and efficiency among peoples of different cultures and level of development aggravates the problem (Tadesse and Kidan, 2005).

There are different factors that affect the practice and adoption of technological innovation in general and specifically E-banking. There are many theories for the adoption of IT. The most used theories for technology adoption are the technology acceptance model (TAM) (Davis F. 1989), theory of planned behavior (TPB) (Ajzen 1985, Ajzen 1991), unified theory of acceptance and use of technology (UTAUT) (Venkatesh *et al.* 2003), diffusion of innovation (DOI)(Rogers & Shoemaker, 1971), technology organization environment (TOE) framework (Tornatzky and Fleischer 1990), institutional theory and (Iacovou et al. 1995) model. From these IT adoption models while TAM, TPB and UTAUT are individual level models, DOI, TOE, institutional theory and (Iacovou et al. 1995) models are at the firm level (Tiago and Maria 2011). The following section will discuss some of the above IT adoption models in detail for the adoption and practice of new technology.

2.1.4. Technology- organization- Environment (TOE) framework

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. Even though theses paper is trying to assess the practice of e-banking it is also including the implementation and adoption of e-banking. Typical characteristics of technology considered in technology adoption studies are based on the assumption of Roger's diffusion of innovation (Rogers & Shoemaker, 1971), 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.

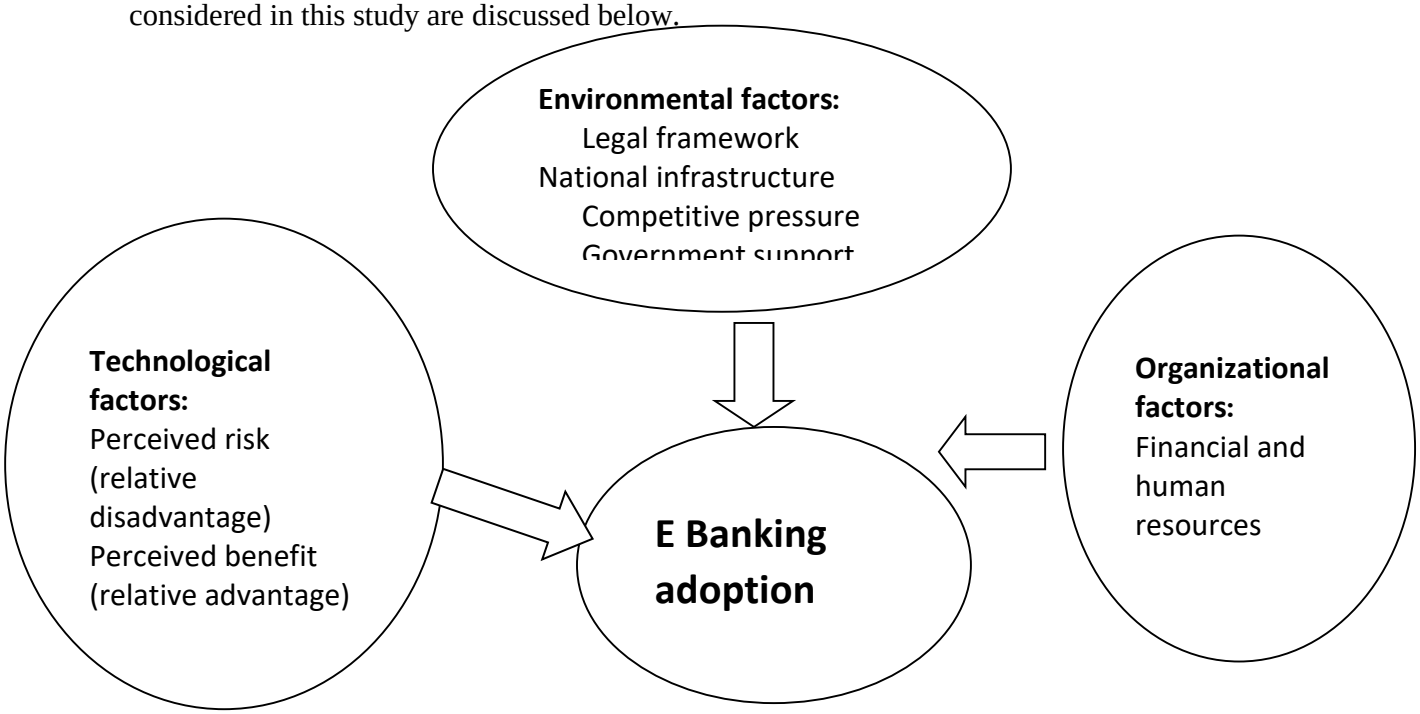


Figure 2-1Technology-Organization-Environment (TOE) frameworks

Source: Ayana (2012)

Technological Factors

It appears that there is a lack of consensus on what factors belong to this context. For example, one study (Salwani 2009) includes technology competence covering existing technology infrastructure and skills to utilize the technology in this context, while other studies (Ellias 2009 & Chang 2007) consider some relevant characteristics of technology. To avoid overlapping between technology and organizational contexts, researcher chooses two basic factors related to technology competence, which have relevant to the organizational factors, i.e., perceived benefits and perceived risks are considered in this study from the technological factors.

1. Perceived benefits: - Perceived benefits of E-banking cover both direct and indirect benefits for the banking industry as well as for the consumers. Direct benefits include the savings on operational cost, improved organizational functionality, productivity gain, improved efficiency, and increased profitability. Indirect benefits include the opportunity or intangible benefits such as improved customer's satisfaction through improved services, improved banking experience and fulfillment of their changing needs and lifestyle (Lu et al. 2005; Kuan & Chau 2001 & Iacovou 1995)

2. Perceived risks: - One of the important risks faced by banking institutions in offering E-banking services is the customers' resistance to use the services which significantly hinder the growth of E-banking (Zhao et al. 2008 and Laforet & Li, 2005). Issues related to security have always been a concern when dealing with technologies related to online transactions such as E-banking (Chang 2007 & Rogers 2003). Therefore, the perception of the risks regarding E-banking is expected to influence its adoption and further growth.

Organizational Factors

Organizations are different in their preference to adopt technological innovation (Iacovou 1995 & Grover 1993) influenced by a number of factors, like firm size, top management support and financial and human resources. In the framework for this study, researchers use one basic organizational factor as discussed below.

Financial and human resources: - Financial resources are an important factor in facilitating innovation adoption for any organization and they are often correlated with the firm size (Kuan 2001 & Iacovou 1995). Therefore, it is expected that the availability of financial resources within the adopting firms is important for E-banking practice. These resources enable banking institutions to obtain human related resources including the required skills and expertise to develop and support the provision of E-banking services.

Environmental factors

Researcher identified factors related to the environmental context that play a crucial role in technology adoption and some factors in this category are arguably more influential than others, especially when countries under study have an authoritative government leadership. The Four factors relevant for E-banking adoptions included in this study are: -

1. Legal Frameworks: - The existence and maturity of E-commerce legal frameworks within a country influence the diffusion of online transactions including E-banking as demonstrated in various studies (Tan & Wu 2002; Martinson &Trappey 2001).

2. The National ICT infrastructure: - National ICT infrastructure is a major factor that supports the adoption of E-banking as the case for other E-commerce initiatives. Without an adequate development level and quality of a nation's ICT infrastructure, E-banking adoption and use cannot do well (Efendioghu 2004 &Scupola 2003).

3. Competitive pressure: - Competitive pressure can strongly influence any bank to develop and adopt E-banking initiatives and it may affect the bank's perception towards E-banking system. As implied in previous studies (Quaddus & Hofmeyer 2007; Gibbs, Kraemer &Dedrick 2003).

4. Government Support: -Government can either directly or indirectly affect the adoption of E-banking in terms of creating a favorable environment and impetus for banking institutions and their customers so that the services can be diffused with the community (Kuan 2001 & Iacovou 1995)

Generally, these theory discuss different variables associated with the adoption of E- banking and i.e. from technological factors perceived benefits and perceived risks, from organizational factors human and financial resources and from environmental factors legal frameworks, national ICT infrastructures, competitive pressure and government support and this theory used to test does this variables affect the adoption of E- banking in Ethiopian banking industry.

2.1.5. Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA), developed by (Fishbein and Ajzen 1975), is probably one of the most influential theories used to explain human behavior (Venkatesh et al., 2003). Simply put, according to this theory, behavioral intentions can be explained by the attitude towards behavior and subjective norm. The attitude towards behavior is defined as "an individual's positive or negative feelings (evaluative effect) about performing the target behavior" (Fishbein and Ajzen, 1975, p. 216). Subjective norm refers to perception that most people who really matter to the individual think that he either should or should not perform the behavior in question" (Fishbein and Ajzen, 1975, p.302). Attitude towards behavior, in turn, can be explained by the salient beliefs in the behavior.

This theory is giving high emphasis to human behavior, norms and beliefs and used to investigate customers behavior, beliefs and norms about the adoption of E- banking in Ethiopian banking industry.

2.1.6. Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) was proposed by (Ajzen 1985) as an extension of TRA (Fishbein and Ajzen, 1975) for situations where people do not have complete control over their behavior. Basically, TPB adds a determinant to the behavioral intention and the attitude towards behavior constructs which is the perceived behavioral control. This construct reflects how people perceive the internal and external limitations to their behavior. On more formal terms, it refers to how easy or difficult people believe it would be to perform certain behaviors (Ajzen, 1985).
In TPB, behavior itself is a function of both the behavioral intention and the perceived behavioral control. Behavioral intention, in turn, is influenced by the attitude towards behavior, the subjective norm and the perceived behavioral control. The determinants of intention (attitude,

subjective norm, and perceived behavioral control) are established by the structure of the underlying (attitudinal, normative and control) beliefs.

Strengths of theory of planned behavior

The theory of planned behavior can cover people's non-volitional behavior which cannot be explained by the theory of reasoned action.

An individual's behavioral intention cannot be the exclusive determinant of behavior where an individual's control over the behavior is incomplete. By adding "perceived behavioral control," the theory of planned behavior can explain the relationship between behavioral intention and actual behavior.

Several studies found that the TPB would help better predict health-related behavioral intention than the theory of reasoned action (Ajzen, 1989). The TPB has improved the predictability of intention in various health-related fields such as condom use, leisure, exercise, diet, etc.

In addition, the theory of planned behavior as well as the theory of reasoned action can explain the individual's social behavior by considering "social norm" as an important variable.

Limitations of theory of planned behavior

Some scholars claim that the theory of planned behavior is based on cognitive processing, and they have criticized the theory on those grounds. More recently, some scholars criticize the theory because it ignores one's needs prior to engaging in a certain action, needs that would affect behavior regardless of expressed attitudes. For example, one might have a very positive attitude towards beefsteak and yet not order a beefsteak because he is not hungry. Or, one might have a very negative attitude towards drinking and little intention to drink and yet engage in drinking as he's seeking group membership.

Also, one's emotions at the interviewing or decision-making time are ignored despite being relevant to the model as emotions can influence beliefs and other constructs of the model. Still, poor predictability for health-related behavior in previous health research seems to be attributed to poor application of the model, associated methods and measures. Most of the research is

correlation, and more evidence based on experimental studies is welcome although experiments, by nature, lack external validity because they prioritize internal validity (Sniehotta, F.F. 2009).

Theory of planned behavior also give high emphasis to human behavior, norms and beliefs and used to investigate customers behavior, beliefs, and norms about the adoption of E- banking in Ethiopian banking industry.

2.1.7. Technology Acceptance model (TAM)

According to (Davis, 1989) TAM assume two sets of beliefs, i.e., Perceived Ease of Use (PEoU) and Perceived Usefulness (PU) to look at individual's technology acceptance. TAM proposes perceived usefulness (PU) and perceived ease of use (PEOU) as fundamental determinants of technological adoption where an individual's intention to use an application is predicted and explained by once perception of the technological usefulness and its simplicity (Hart O. et al, 2012).

Perceived Ease of Use refers to the level of degree where an individual believes that using a particular system would be free of physical and mental effort. It measures the prospective user's assessment of the mental efforts required of the use of the target applications (Davis, 1993). Opia (2008) claimed that innovations with perceived complexities of user interface and steep learning curve, which thought risky to adopt. Empirical findings confirm the positive relationships between attitude towards use and ease of use (Venkatesh & Davis, 2000) and show that PEOU is a proven key determinant of users' intention to accept IT (Venkatesh, 2000). Thus, ease of use is a powerful determinant of intention to accept innovation(s) (Hart O. et al, 2012).

Perceived Usefulness on the other hand is related to users' perception of the degree to which using a system will be beneficial (Alsabbagh & Molla, 2004). It provides diagnostic lenses into how actual use and intention to use or attitude towards using are influenced. The near-term results are synonymous with postulates of PU; and the long-term consequences refer to consequential results in one's career or social image, which reflects Rogers' (1995) important motivation for adoption of innovation. The attainment of perceived near-term usefulness paves way for long-term usefulness (Hart O. et al, 2012). It relates to the cost and time saving and it considered from the perspective of improving service delivery and creating more access to users.

Decomposing PU as (Triandis, 1980) and (Chau, 1996) did explicitly provides more specific lenses into understanding user perception of Information Technology's usefulness.

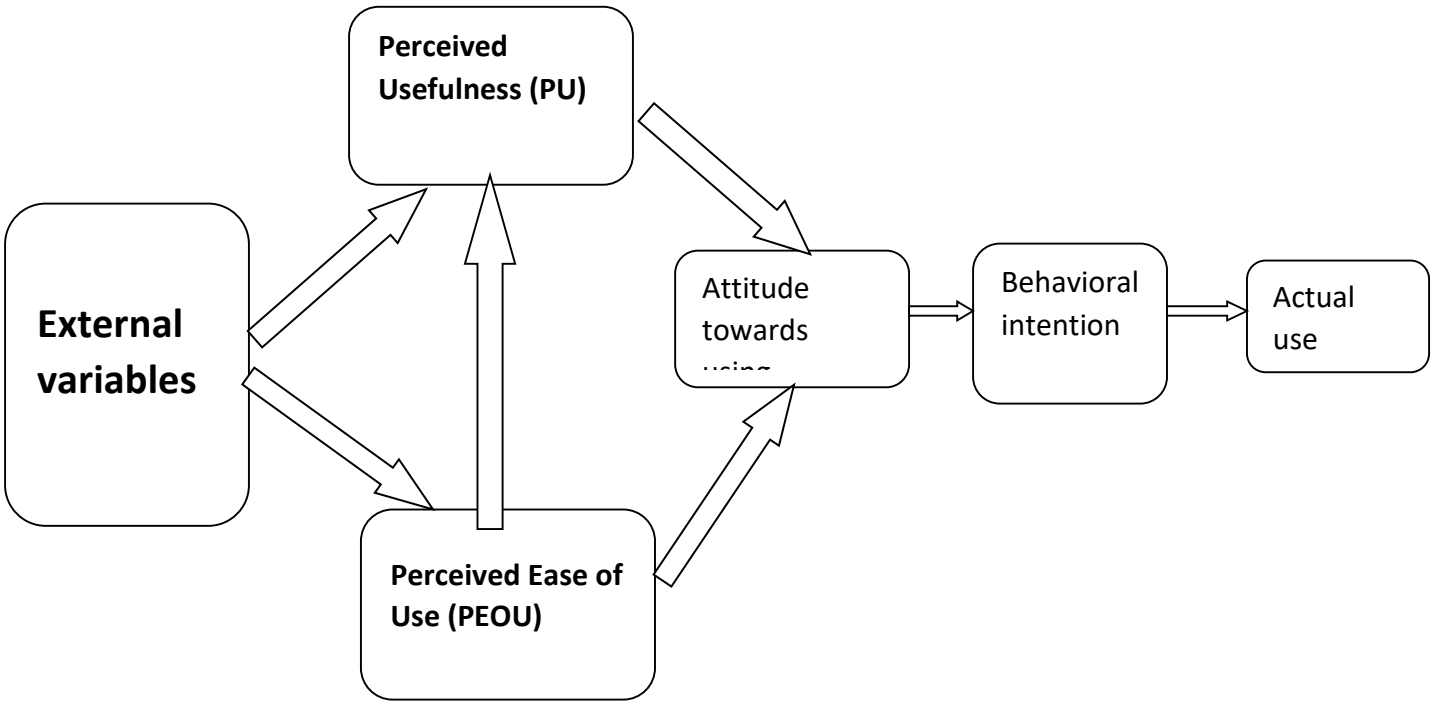


Figure 2-2 Technology Acceptance Model (TAM)

Source: Davis & Venkatesh (1996)

The reason for the popularity of TAM as the theoretical framework is that, TAM is a theory specifically developed for ICT implementation and adoption research. It is a theory owned by the IS research community, a field, in which theories are scarce Lee, Y., Kozar, K. A., & Larsen, K. R. T., (2003). TAM provides a clear and tested framework for ICT adoption and implementation research Yousafzai, S. Y., Foxall G. R., & Pallister, J. G., (2007). The other strength of TAM is its simplicity Davis, F. D. (1989) which has been achieved by leaving social and organizational factors outside the scope of the theory.

On the other hand, looking at the weaknesses, TAM has left out social and organizational factors in its construct, which are very instrumental in influencing technological innovation and ICT adoption. Also, extending TAM to achieve other variations of TAM such TAM2 or other

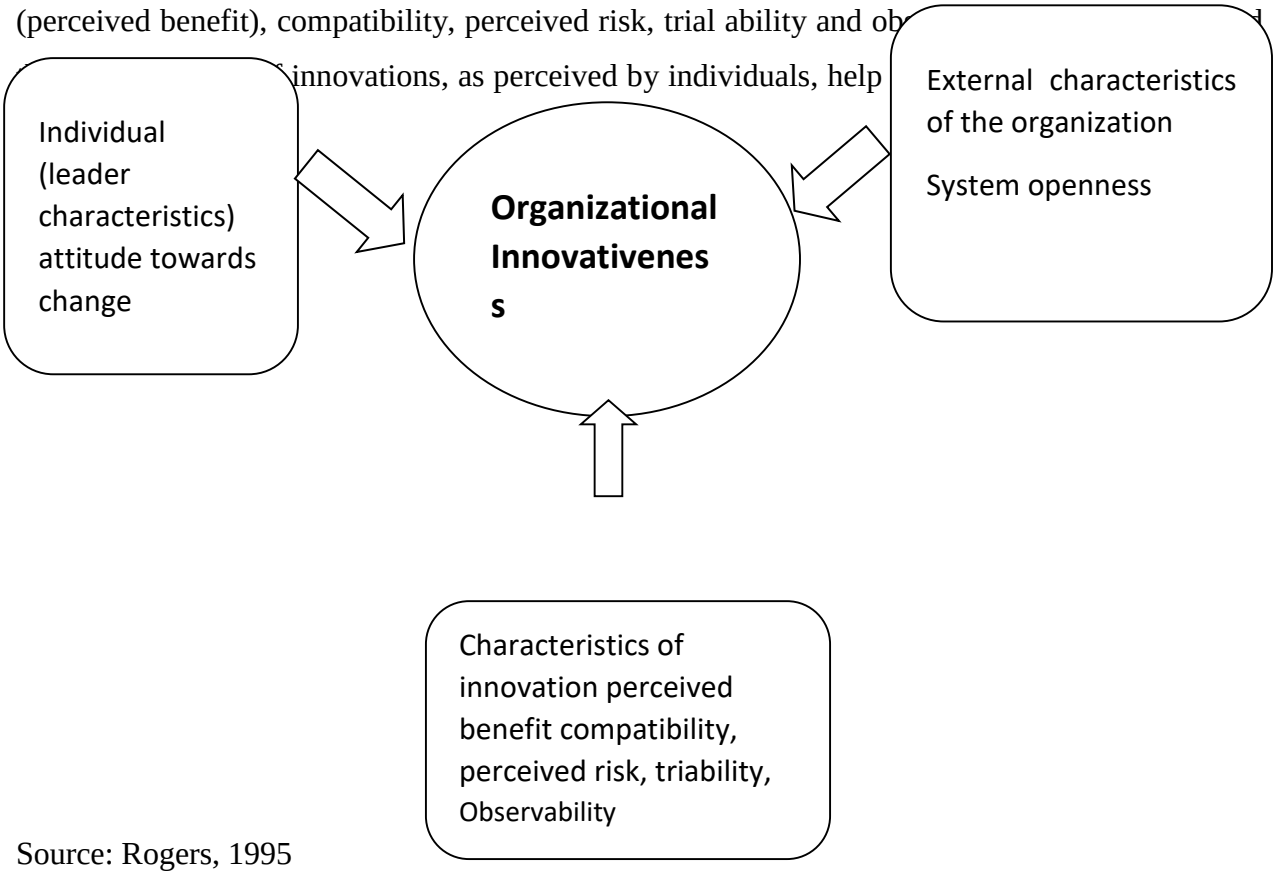
different models and independent variables may cause a theoretical confusion in which, it may become unclear which version of the many iterations of TAM is the commonly accepted one (Benbasat, I. & Barki. H. 2007). Also, the many extensions of TAM did not succeed in deepening the theory in the sense of explaining the essential concepts in greater depth (Whetten, D. A., 1989), for example, by explaining exactly what perceived usefulness or ease of use means (Bagozzi, R. P., 2007). Criticisms of TAM as a "theory" include its questionable heuristic value, limited explanatory and predictive power, triviality, and lack of any practical value (Chuttur 2009). Benbasat and Barki suggest that TAM "has diverted researchers' attention away from other important research issues and has created an illusion of progress in knowledge accumulation. Furthermore, the independent attempt by several researchers to expand TAM in order to adapt it to the constantly changing IT environments has led to a state of theoretical chaos and confusion (Benbasat and Barki 2007). This is the reason why this study found TAM and its extension unsuitable.

This model is associated with the adoption of e- banking because using of technology have its own advantage and disadvantage (risk) i.e., perceived usefulness and perceived ease of use and TAM is used to elaborate perceived usefulness and perceived ease of use associated with the use of IT technology in general and adoption of E- banking in Ethiopian banking industry.

2.1.8. Diffusion of Innovation (DOI)

As Rogers explained, DOI is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. DOI theory sees innovations as being communicated through certain channels over time and within a particular social system. Individuals are seen as possessing different degrees of willingness to adopt innovations, and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time. Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of individual innovativeness (from earliest to latest adopters): innovators, early adopters, early majority, late majority, laggards (Rogers 1995). The innovation process in organizations is much more complex. It generally involves a number of individuals, perhaps including both supporters and opponents of the new idea, each of whom plays a role in the innovation-decision (Rogers 1995).

Based on DOI theory at firm level, Rogers stated innovativeness is related to such independent variables as individual (leader) characteristics, characteristics of innovation, and external characteristics of the organization. As shown in Figure 2, individual characteristics describe the leader's attitude toward change. Characteristics of innovation include relative advantage (perceived benefit), compatibility, perceived risk, trial ability and ob[illegible] innovations, as perceived by individuals, help



Source: Rogers, 1995

Figure 2-3 Innovation of diffusion

Rogers explained the independent variables as follows:

Relative advantage (perceived benefit) is the degree to which an innovation is perceived as better than the idea it supersedes. The degree of relative advantage may be measured in economic terms, but social-prestige factors, convenience, and satisfaction are also often important components. It does not matter so much whether an innovation has a great deal of "objective" advantage. What does matter is whether an individual perceives innovation as advantageous. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is going to be.

Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. An idea that is not compatible with the prevalent values and norms of a social system will not be adopted as rapidly as an innovation that is compatible. The adoption of an incompatible innovation often requires the prior adoption of a new value system...

Perceived risk is the degree to which an innovation is perceived as difficult to understand and use. Some innovations are readily understood by most members of a social system; others are more complicated and will be adopted more slowly.

Trial ability is the degree to which an innovation may be experimented on a limited basis. New ideas that can be tried on the installment plan will generally be adopted more quickly than innovations that are not divisible.

Observability is the degree to which the results of an innovation are visible to others. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt. Such visibility stimulates peer discussion of a new idea, as friends and neighbors of an adopter ask him or her for innovation-evaluation information about it. External characteristics of organization refer to system openness.

Strength and weakness

DOI theory has the following strengths: DOI represents important advancement over earlier limited effects theory. It drew from existing empirical generalizations and synthesized them into a coherent, insightful perspective. It was consistent with most findings from effects surveys and persuasion experiments, and above all, it is very practical. It laid the foundation for numerous promotional communication and marketing theories and the campaigns they support even till today.

The weakness of DIO theory is linear, and source dominated because it sees communication process from the point of view of elite who has decided to diffuse information or an innovation. This theory also underestimates the power of media. They mainly create awareness of the new innovations. It assigns a very central role to different types of people critical to the diffusion process. The theory simply says that the media influence innovators or early adopters who

influence opinion leaders who in turn influence everyone else. Rogers failed to realize that the media can also be used to provide a basis for group discussions led by change agents. Another fall out of this theory is that it stimulates adoption by groups that do not want the innovation.

In the adopters' categories of this theory, it is noted that the category of a set of adopters is omitted. Rogers didn't realize that some adopters may have the features of innovators/early adopters but may not quickly adopt an innovation.

Diffusion of innovations theory is often simplified to focus solely on a product or innovation, disregarding the complex societal, cultural, economic, and other factors that determine how the product is adopted into society. Diffusion research focusing on a few select innovations often fails to advance and draw important conclusions on the larger theory.

Finally, Diffusion of innovation theory discuss factors affect the adoption of information technology in general and E- banking adoption in particular factors like relative advantage, compatibility, perceived risk(complexity), trial ability and observability and this theory used to test does this factors affect the adoption of E- banking in Ethiopian banking industry.

2.1.9. Rational Choice Theory

The basic idea of rational choice theory is that patterns of behavior in societies reflect the choices made by individuals as they try to maximize their benefits and minimize their costs. In other words, people make decisions about how they should act by comparing the costs and benefits of different courses of action. As a result, patterns of behavior will develop within the societies that result from those choices. Rationality, interpreted as wanting more rather than less of a good, is widely used as an assumption of the behavior of individuals in microeconomic models and analysis. It attaches wanting more to instrumental rationality, which involves seeking the most cost-effective means to achieve a specific goal without reflecting on the worthiness of that goal (Blume & Easley 2008). Rational choice theory uses a specific and narrower definition of rationality simply to mean that an individual acts as if balancing costs against benefits to arrive at action that maximizes personal advantage. In rational choice theory, all decisions, crazy or sane, are postulated as mimicking such a rational process. Thus, rationality is seen as a property of

patterns of choices, rather than of individual choices. According to the Rational Choice Theory, human beings are prompted by their own goals and preferences. Human actions are regulated primarily by the information regarding the conditions under which a particular individual is going to work and would try to achieve his or her goal. It is almost impossible for human beings to get what they desire. According to the Rational Choice Theory, an individual should have a proper understanding of his or her own selection of goals and the consequences of that selection. Rational people always choose only those options that can offer good results (Peter, 2004).

Rational choice theory mainly focuses on human behavior of choice in order to maximize benefit and minimize risk of choice decision. This is the main input for the study of factors affecting the adoption of E- banking in Ethiopian banking industry because it investigates the behavior of customers and their choice decision.

2.2. Empirical Review

2.2.1. Technological factors and adoption of E- banking

It appears that there is a lack of consensus on what factors belong to this context. For example, one study (Salwani 2009) includes technology competence covering existing technology infrastructure and skills to utilize the technology in this context, while other studies (Ellias 2009 & Chang 2007) consider some relevant characteristics of technology. To avoid overlapping between technology and organizational contexts, researcher chooses two basic factors related to technology competence, which have relevant to the organizational factors, i.e., perceived benefits and perceived risks are considered in this study from the technological factors.

1. Perceived benefits: - Perceived benefits of E-banking cover both direct and indirect benefits for the banking industry as well as for the consumers. Direct benefits include the savings on operational cost, improved organizational functionality, productivity gain, improved efficiency and increased profitability. Indirect benefits include the opportunity or intangible benefits such as improved customer's satisfaction through improved services, improved banking experience and fulfillment of their changing needs and lifestyle (Lu et al. 2005; Kuan&Chau 2001 &Iacovou 1995)
2. Perceived risks: - One of the important risks faced by banking institutions in offering E-banking services is the customers' resistance to use the services which significantly

hinder the growth of E-banking (Zhao et al. 2008 &Laforet 2005). Issues related to security have always been a concern when dealing with technologies related to online transactions such as E-banking (Chang 2007 & Rogers 2003). Therefore, the perception of the risks regarding E-banking is expected to influence its adoption and further growth.

2.2.2. Environmental factors and adoption of E- banking.

Environmental factors mainly relate to different facilitating and inhibiting factors in areas of operations (Al-Qirim, 2006). The arena in which a firm conduct its business in adopting technological innovations; its industry, competitors, access to resources supplied by other externals and dealings with government are claimed to be covered under environmental contexts (Kvin Z. et al. 2004). Legal frameworks, the National ICT infrastructure, Competitive pressure, and Government support are amongst significant factors to be considered in the study (Ayana, 2012) as described here under.

1. **Legal Frameworks: -** The existence and maturity of legal frameworks on e-commerce within a country to influence the diffusion of online transactions including electronic banking as indicated in various studies (Tan & Wu, 2002 and Martinson, 2001).
2. **National ICT Infrastructure: -** National ICT infrastructure is a major factor that supports the adoption of an e-banking system as the case for other initiatives. Without adequate development and quality of a national ICT infrastructure, e-banking adoption and use cannot do well (Efendioghu 2004 & Scupola 2003).
3. **Competitive pressure: -** Competitive pressure can strongly influence any bank to develop and adopt e-banking initiatives and it may affect the bank's perception towards innovation (Quaddus & Hofmeyer 2007). Intense competition stimulates the adoption of innovation (Mansfield et al. 1977).
4. **Government Support: -**Government can either directly or indirectly affect the adoption of E-banking in terms of creating a favorable environment and momentum for banking institutions and their customers so that the services can be diffused with the community (Kuan 2001 & Iacovou 1995)

2.2.3. Organizational factors and adoption of E- banking

Organizational factor captures firm's business scope, organizational culture, top management support, complexity of organizational structure measured in terms of centralization, vertical differentiation, and formalization, the quality of human resource, and size related issues such as specialization and internal slack resources (Jeyaraj A. Et al, 2006). Iacovou (1995) and (Grover 1993) also argued that organizations influenced by a number of factors, like firm size, top management support and financial and human resources in their preference to adopt technological innovation. As per Kvin Z. et al. (2004) and Tornatzky and Fleisher (1990) it is defined in terms of several descriptive measures: firm size and scope; the formalization, centralization, and complexity of its managerial structure; the quality of its human resources and the amount of internally available slack resources. Accordingly, the researcher considered financial and human resources as the organizational factor in the framework for the study as discussed below.

Financial and Human Resources: - Financial resources are an important factor in facilitating innovation adoption for any organization and they are often correlated with the firm size (Iacovou 1995 and Kuan 2001). The availability of financial resources and costs related to the adoption of innovations has paramount importance and deserves consideration. Human resources that enable banks to obtain the required technical and managerial skills and expertise to adopt and implement technological innovations like electronic banking system are also found important to consider as factors without disregarding the customer sides.

2.2.4. Lack of awareness

Octovian and Daniela (2006) mentioned that Romanian customers were not adopting internet banking services because of unawareness and sufficient information about internet banking. In a parallel the study by Octovian and Daniela (2006) and Omar et al. (2011), it was discovered that most of the bank customers are still not aware of internet banking services, although customers would possibly adopt internet banking due to their willingness to accept change and innovation, and to appreciate ease of navigation on banks website with resulting time savings.

Devadevan V (2013) conducted a survey on 65 respondents and found that 84.6% of the same had tested the mobile banking facility while the rest were unaware of the same. Laforet S, Xiaoyan Li, (2005) points out a low level of awareness in China as far as mobile banking was concerned. In view of the same, Laukkanen T, Kiviniemi V (2010) tested the impact of information and guidance offered by the bank. They found that the information and guidance offered by a bank has the most significant effect on perceived functional usability of mobile banking and significantly increases the positive image associated with the innovation. The results also suggested that information and guidance significantly increase the perceived value added provided by mobile banking and decreases the perceived risks related to the innovation. However, information and guidance have no significant impact of psychological barriers like tradition.

2.2.5. Demographic factors and adoption of E- banking

Demographic factors have a great impact on consumer attitudes and behavior towards new technology acceptance such as e-banking. Age, gender, educational level, income, and occupation are among the most influential demographic variables affecting e-banking usage. The empirical studies related to these important demographic factors from the perspective of e-banking usages are discussed.

Gender

Gender refers to the difference in the adoption and usage of new technology such as e-banking between male and female. The impact of gender on customers' e-banking usage behavior has been validated by a number of scholars as explained below.

A study conducted by Alagheband (2006) to identify factors affecting the adoption of e-banking services indicated that men represent the segment with the highest use of e-banking. Similarly, Alafeef et al. (2011) on their study regarding the influence of demographic factors on e-banking adoption discovered that gender has strong effects on the adoption level of e-banking applications in which males have greater e-banking usage experience as compared to females. Azouzi (2009) also discovered that gender is a crucial variable impacting the customers, attitude towards the adoption of e-banking. Similarly, Muzividzi et al. (2013) on their study shown that e-banking is popular with men than women. This may be because men have the courage to take up new technology even with little information about it. Men usually are keen to experiment than

women. However, Ismail et al. (2012) And Izogo (2012) found that there is no significant association between e-banking usages with gender. Besides, Sheshadri et al. (2014) Found that gender does not have an effect on the customer adoption of electronic banking. Both genders have equivalent levels of adoption of these services as now a day's both genders are employed and so they have their individual bank accounts and have their own practice of these technological services. Both genders have a diverse knowledge of these services presented by their banks. Therefore, they conclude that gender does not play a role in link with the technology adoption as both males and females are qualified in today's situation.

Age

A study conducted by Abenet (2010) concerning the determinants of e-banking adoption in Ethiopia revealed that the young age group is more computer literate and finds it easy to accept and use new technologies. Poon WC (2008) and Azouzi D (2009) on their study also supports that young and computer literate respondents are using or are willing to use electronic banking. The hypothesis tested to diagnose the relationship between age and e-banking preference by Yitbarek et al. (2013) shows a gradual but steady decline in the percentage preference of e-banking as the age group increases. This means that the percentage preference for e-banking for the 18 to 25 years age group is greater than the percentage preference for e-banking for the above 60 years age group. This makes it quite clear that the younger the age group, the greater their preference for electronic banking.

Educational Level

The impact of education on bank customers' e-banking usages practice is discussed below by reviewing various previous studies. For example, a study conducted by Abenet (2010) in Ethiopia found that e-banking usage practice is greater among those peoples who are in a better educational level as compared to others, so educational level has positive impact on e-banking adoption. This finding is in line with Edwin et al. (2014) who found that consumers' level of education and ICT knowledge impacts their acceptance of e-banking services. A number of the respondents were ICT literate and used it in their everyday transactions, which shows a fair amount of ICT knowledge. Further a study conducted by Izogo (2012), Alafeef et al. (2011) and Margaret et al. (2013) concerning the impact of demographic factors on e-banking adoption

among bank customers using Chi-Square Test found that educational status has significant effect on customers' adoption and usage of e-banking. They discovered that the education level is the strongest positive factor that influences the adoption level of e-banking whereby the younger generations are highly educated. In line with this Tater et al. (2011) on their study identified that customers with post-graduate and graduate qualifications are mostly adaptors of IT banking services such as e-banking. This implies that higher qualification is associated with bringing attention towards new technology banking services and qualification is a factor found to be relevant.

UNIT THREE

3. METHODOLOGY

3.1. Introduction

This section presents the detail methodology that was applied to obtain representative data from sampled banks and contains seven major components: research design, definition of target population, sampling technique and size, inclusion and exclusion criteria, data collection methods and sources, method of data analysis and presentation and ethical consideration.

3.2. Research approach

The used quantitative method of research approach due to the type of data I need to respond the research questions.

3.3. Research Design

The researcher employed both descriptive and exploratory research design methods in order to gather as much information as possible concerning the determinants of digital banking the adoption. According to Yin (1994) exploratory research is designed to allow a researcher to just look around with respect to some phenomenon, with the aim to develop suggestive ideas. An exploratory research design was considered the most suitable approach in view of the nature of the problem being investigated. According to Zikmund, W.G. (2000), exploratory research is conducted to clarify and research a better understanding of the nature of the problem. Consequently, it is appropriate to use it when there is little prior knowledge of the problem being researched. Saunders & Thornhill (2003) argue that exploratory research is advantageous because it is flexible and adaptable to change. To do that, an exploratory type of study was selected, because it gives valuable insight of the problem and provides suggestive ideas through reviewing information from problem area.

3.4. Definition of target population

The target population of the study is five commercial banks digital banking department employees located in Addis Ababa. As there are 22 banks in Ethiopia, the researcher selected 5

banks. Based on the preliminary investigation there are 2,230 digital banking employees in the five banks and the questionnaire was distributed to 339 of them.

3.5. Sample size

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 represents the total group (Leedy, 1989). Commercial banks have been operated and the additional banks which make an initial public offering to begin their operation were taken as population, and purposely draw a sample from the total to get rich evidence. The total number of Commercial Banks which are operated in the year 2022 is 20 private banks and 2 state-owned banks. The population for this study is digital banking employees selected from one government owned and four private banks. These categories are chosen because members of each category significantly contribute to the use and provision of electronic banking services. Commercial bank of Ethiopia (CBE), Dashen Bank (DB), Awash Bank (AB), Zemen bank (ZB) and Bank of Abyssinia was selected. In addition, these banks are purposely selected for the reason that the researcher has got willing and cooperative individuals who can assist in providing the relevant information on electronic banking services. Moreover, the researcher selected commercial bank of Ethiopia for the reason that he is x staff of CBE; and employee of Bank of Abyssinia where he has enough experience, information obtained from personal observation.

Yamane (1967) suggested another simplified formula for calculation of sample size from a population which is an alternative to Cochran's formula. According to him, for a 95% confidence level and p □□0.5, size of the sample should be.

$$n = \frac{N}{1 + N(e^2)}$$

Where N is the population size is sample size and e is the level of precision.

Let this formula be used for our population, in which N =2,230 with ±5% precision.

Assuming 95% confidence level and p =0.5, we get the sample size

$$n = \frac{2{,}230}{1+2{,}230(.05^2)} = 339$$

Based on the above formula, three hundred thirty-nine (339) digital banking employees are included in the sample as respondents for the questionnaire.

The proportional allocation method was originally proposed by Bowley (1926). In this method, the sampling fraction $\frac{n}{N}$ is same in all strata. This allocation was used to obtain a sample that can estimate the size of the sample with greater speed and a higher degree of precision. The allocation of a given sample of size *n* to different stratum was done in proportion to their sizes. I.e. in the i^{t} stratum, $\boldsymbol{n_i = n\frac{Ni}{N}}$ i =1, 2, 3.

Where *n* represents sample size, *Ni* represents population size of the ith strata and *N* represents the population size. In our study, *N* = 2,230; *n*= 339.Based on the above assumption the sample from each bank should be.

1. Commercial bank of Ethiopia

$$\boldsymbol{N_1 = n\frac{N1}{N}} = 339\,\frac{\mathbf{1365}}{\mathbf{2{,}230}} = \mathbf{208}$$

2. Bank of Abyssinia

$$\boldsymbol{N2 = n\frac{N2}{N}} \quad 339\,\frac{\mathbf{262}}{\mathbf{2{,}230}} = \mathbf{40}$$

3. Dashen bank s.c.

$$\boldsymbol{N3 = n\frac{N3}{N}} \quad 339\,\frac{\mathbf{238}}{\mathbf{2{,}230}} = \mathbf{36}$$

4. Awash bank s.c.

$$\boldsymbol{N4 = n\frac{N4}{N}} \quad 339\,\frac{\mathbf{259}}{\mathbf{2{,}230}} = \mathbf{40}$$

5. Zemen bank.

$$\boldsymbol{N5 = n\frac{N5}{N}} \quad 339\,\frac{\mathbf{101}}{\mathbf{2{,}230}} = \mathbf{15}$$

3.6. Sampling Technique

Digital banking employees was selected convenient sampling techniques to distribute and collect questionaries' to all of the sample.

3.7. Data collection method

In order to collect sufficient data that can answer the research questions, researchers designed two surveys; the first was a questionnaire to get quantified results. The second survey was interviews aimed at collecting data from digital banking managers. In addition to questionnaires and interview, data collected from different published and unpublished materials has been also used.

3.7.1. Questionnaires

As indicated above, the digital banking employees of the purposely sampled five commercial banks was included in the survey. A questionnaire was distributed to all 339 samples of five purposely sampled commercial banks digital banking employees. Questions was presented in the form of affirmative statements, relating to the concepts on digital banking to identify their intention on the factors affecting the adoption of digital banking, in such a way to enable measurement of the respondent's opinions. The questionnaires were structured in close-ended type and responses to the questions measure a five Likert rating scale where: Strongly Agree (SA) = 5; Agree (A) = 4; Neutral (N) =3, Disagree (D) = 2; and Strongly Disagree (SD) = 1; the use of Likert scale is to make it easier for respondents to answer question in a simple way. In addition, this research instrument permits an efficient use of statistics for the interpretation of data. Moreover, the central issue to argue that likert scales is that can produce ordinal data. Johns (2010) noted that in statistical terms the level of measurement of the likert response scale is ordinal rather than interval: that is, we can make assumptions about the order but not the spacing of the response options. Thus, the permissible descriptive statistics that can perform on ordinal data are mean (or average response) and mode (or more frequent responses) (Hole 2011).

3.7.2. Interviews

In the qualitative strategy, semi-structured interview was conducted with one digital banking department managers from each of the five chosen banks to have sufficient information regarding the research problem and with the relevant body at National Bank of Ethiopia (NBE). The major purpose of this interview is to corroborate certain facts that the investigator already thinks have been established (Yin, 1989). Therefore, the semi-structured interviews were conducted to enhance and supplement the results of questionnaires.

3.8. Data Source

I used both primary and secondary data sources. Primary data sources from questionnaires and interviews and secondary data from books, previous research, internet, financial institutions web site etc.

3.9. Method of data analysis and presentation

Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence, to address the initial proposition of a study (Yin, 1989). I tried to analyze the data through descriptive statistics using statistical package for social scientists (SPSS 26).

Wolcott (1994) cited in 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 interview and reviews of documents were interpreted qualitatively. The qualitative type of data analysis technique will be used based on the data gathered from experts of various institutions mentioned above with narration and systematic summary. Analyzing qualitative data typically involves immersing oneself in the data to become familiar with it, then looking for patterns and themes, searching for various relationships between data that help the researchers to understand what they have, then visually displaying the information and writing it up (Westbrook, 1994).

In analyzing the data from interviews, narrative approaches were employed. Moreover, linear regression analysis will be used to test the developed hypotheses.

3.10. Ethical consideration

Ethical clearance will be primarily obtained from Saint Merry University and then permission from each target organization. Finally informed written and verbal consent will be obtained from the study subjects and data collection was undertaken on the basis of their voluntarily participation. Participating respondents were ensured that information obtained will be strictly confidential.

UNIT FOUR

4. RESULTS AND DISCUSSIONS

4.1. Introduction

This chapter contains the findings and analysis of the research study based on interpretation of the data collected. The researcher distributed a total of 339 questionnaires to five purposely sampled commercial bank digital banking employees: Commercial bank of Ethiopia (208 questionnaires), Bank of Abyssinia (40 questionnaires), Dashen Bank (36 questionnaires), Awash bank (40 questionnaires) and Zemen bank (15 questionnaires). Out of the total 339 questionnaires, 305 valid and usable questionnaires were obtained to enable a meaningful analysis of the data with 90% response rate. The research findings relate to the results of the effects of awareness, organization factors, environmental factors, technological factors, and demographic factors variables in the adoption of digital banking.

Additionally, the effects of awareness, organization factors, environmental factors, technological factors, and demographic factors with respect to adoption of digital banking are determined and scrutinized based on detailed elements of the measurements. Furthermore, the study findings are subjected to statistical analysis, which are discussed in more detail. For example, linear regression analysis was used for test of the hypothesis to indicate the extent to which the relationship of the determinants in the adoption of digital banking services were explained through the use of the mentioned factors in the survey questionnaires under each determinant. Hence, the research results that were collected through the survey questionnaires were analyzed using descriptive statistics and linear regression inferential statistics with the help of SPSS 26 software and the results are presented and discussed in the following sections.

4.2. Respondent Demographic Profile

The study participants on the survey questionnaire have different personal information; besides these differences they introduce different responses towards digital banking usage, and the factors that Influence digital banking adoption. The following discussion shows these differences. The demographic profile of respondents, participated in this study was shown in table 4.1 as follows.

Table 4.1 Respondents demographic profile

Variable	Classification of variable	Frequency	Percentage
Gender	Male	**171**	**56.1**
	Female	**134**	**43.9**
Age	Below 20	**0**	**0**
	20 to 30 years	170	55.7
	31 to 40 years	109	35.7
	41 to 50 years	26	8.5
	Above 50 years	-	-
Educational level	Grade 12 and below	**0**	**0**
	Diploma holder	**0**	**0**
	First Degree holder	199	65.2
	Master's Degree	106	34.8
	Above Master's Degree	-	-

As it is shown on the above table, the highest percentage of participants in this study was males who represent 56.1% of respondents. In the case of classification of respondents by age 55.7% of the respondents are young (20-30 years old). Regarding the educational level of the study 65.2% of the respondents are BA degree holders.

4.3. Factors affecting adoption of digital banking in Ethiopia.

Questionnaires were distributed to identify perceptions of the sampled digital banking employees with respect to factors affecting the adoption of digital banking services. Result obtained from survey respondents of five sampled banks digital banking employees regarding their perception towards awareness associated with adoption of digital banking service using descriptive statistics are depicted below.

Table 4.2 Lack of awareness

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
I have enough knowledge and skills about digital banking services.	-	-	38	140	127	4.3	0.7
	-	-	12.5%	45.9%	41.6%		
The bank provides support (on its website) to its customers	131	97	22	22	33	2.1	1.3
	43%	31.8%	7.2%	7.2%	10.8%		

Source: own survey result computed in SPSS 26, 2022

Results depicted in the above table indicates that the respondents were strongly agree and agree on the statement as they have enough knowledge and skills about digital banking services with the mean score of 4.3 and standard deviation of 0.7 Similarly respondents were strongly disagreeing and disagree on the statement the bank provides web based digital banking support to its customers with the mean score of 2.1 and standard deviation of 1.3 Based on the survey result majority of the employees have enough knowledge and skills about digital banking services and the bank does not provide web based digital banking support to its customers to use digital banking services. The study results are consistent with the findings of **(Amola Bahatt 2016); and (Alex Alecheni O. Peter 2015**) who found lack of awareness has an effect in adoption of digital banking services.

4.3.1. Environmental Factors

Results obtained from survey respondents of five selected bank digital banking employees regarding factors affecting the adoption of digital banking under determinant environmental factors that focus mainly on ICT infrastructure, legal frameworks, government support and competition are depicted below using descriptive statistics: -

4.3.1.1. National ICT infrastructure

Despite the recent improvements made on the national infrastructure, the overall ICT infrastructure in Ethiopia remains inadequate. Table 4.3 shows the study results.

Table 4.3 National ICT infrastructure

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
My bank has adequate ICT infrastructure to conduct digital banking.	131 43%	86 28.2%	16 5.2%	48 15.7%	24 7.9%	2.17	1.34
The quality of internet connection and mobile network significantly affects e- banking.	19 6.2%	49 16.1%	17 5.6%	110 36.1%	110 36.1%	3.8	1.25
Ethio Telecom provided high speed internet and mobile connection.	114 37.4%%	109 35.7%	16 5.2%	36 11.8%	30 9.8%	2.21	1.32

Source: own survey result computed in SPSS 26, 2022

As indicated in the above table 71.2% of respondents Disagree as their bank has adequate ICT infrastructure to conduct digital banking (Mean 2.17 and std.dev. 1.34) and 73.1% of respondents disagree as Ethio Telecom provided high speed internet and mobile connection (Mean 2.21 and std.dev. 1.32s).72.2% of respondents agree and strongly agree with the question of the quality of internet connection and mobile network significantly affects e- banking (Mean 3.8and std dev 1.25). So, the response of the respondents implies that national ICT infrastructure is back bone of both digital banking services.

On the other hand, an interview conducted with digital banking managers of sample banks stated that, lack of well-functioning ICT infrastructure and poor internet and mobile connection significantly affect the smooth functioning digital banking service.

4.3.1.2. Legal and regulatory framework

Table 4.4 shows the response of study participant regarding the legal and regulatory framework for adoption of digital banking service.

Table 4.4 Legal and regulatory framework

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
My bank has regulatory guidelines on digital banking	105 34.4%	111 36.4%	26 8.5%	37 12.1%	26 8.5%	2.24	1.28
It is difficult to perform digital banking because of absence of suitable legal and regulatory framework for e-commerce and e-payment.	14 4.6%	18 5.9%	22 7.2%	136 44.6%	115 37.7%	4.05	1.05

Source: own survey result computed in SPSS 26, 2022

As the above table show 70.8% of the respondent disagree and strongly disagree as their bank has regulatory guidelines on digital banking (Mean 2.24 and std dev.1.28 and 82.3% the participants agree and strongly agree as it is difficult to perform digital banking because of absence of suitable legal and regulatory framework for e-commerce and e-payment (Mean 4.05 and std 1.05.). As the survey result shown in the above lack of legal and regulatory framework affect the adoption of digital banking. Similarly, an interview conducted with one of the selected bank digital banking managers also prove that Ethiopia does not have encouraging digital banking policy.

4.3.1.3. Government support

Government can either directly or indirectly affect the adoption of digital banking in terms of creating a favorable environment and impetus for banking industry and their customers so that the services can be diffused with the community. The below table shows the questionnaire results about the government support.

Table 4.5 Government support

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
The Government promotes digital banking for its citizens.	125 41%	91 29.8%	17 5.6%	38 12.5%	34 11.1%	2.23	1.39
The government providing necessary infrastructural facilities (road, electric power, telecommunication and etc) to remote area of the country in order to facilitate digital banking adoption.	131 43%	93 30.5%	20 6.6%	35 11.5%	26 8.5%	2.12	1.31
The government institution's public agencies, share companies, plc's can easily accept digital banking payment advices generated by digital banking users	186 61%	79 25.9%	23 7.5%	17 5.6%		1.58	0.86

Source: own survey result computed in SPSS 26, 2022

Majority of the respondents disagree with the Government promotes digital banking services for its citizens (Mean 2.23 and std dev. 1.39) and also disagree with the statement the government providing necessary infrastructural facilities (road, electric power, telecommunication and etc) to remote area of the country in order to facilitate digital banking adoption (Mean value of 2.12 and std dev. 1.31) and 76% of the respondents disagree and strongly disagree as government institution's public agencies , share companies, plc.'s can easily accept digital banking payment advices generated by digital banking users(mean value of 1.58 and Std.Dev 0.86) . Based on the survey result, lack of government support has a significant effect on adoption of digital banking.

4.3.1.4. Competitive pressure

The competition from both foreign and domestic private banks appears to be the most important driver for the banking industry to adopt and develop digital banking. Table 4.6 shows the questionnaire response on lack of competitive pressure between local and foreign banks.

Table 4.6competitive pressure

Factors	**SD** **1**	**D** **2**	**N** **3**	**A** **4**	**SA** **5**	**Mean**	**Std** **Dev.**
There is high competition between local banks on digital banking services.	43	39	16	111	96	3.58	1.41
	14.1%	12.8%	5.2%	36.4%	31.5%		
Absence of competition from foreign banks has influence on digital banking.	25	40	19	132	89	3.72	1.24
	8.2%	13.1%	6.2%	43.3%	29.2%		

Source: own survey result computed in SPSS 26, 2022

As the above table shows the participants agreed as there is high competition between local banks digital banking services with the mean value of 3.58 and std dev. 1.41 The respondents also agreed that absence of competition from foreign banks has influence on digital banking with the mean value of 3.72 and std dev. 1.24. This implies that the absence of competition from foreign banks has an effect on adoption of digital banking services.

4.3.2. Organizational Factors

Results obtained from survey respondents of five selected sample bank digital banking employees regarding factors affecting the adoption of digital banking under determinant organizational factors that focus mainly on finance and human aspects of the service are depicted below using descriptive statistics: -

4.3.2.1. Financial resource

Financial resources are an important factor in facilitating innovation adoption for any organization and they are often correlated with the firm size (Kuan 2001 & Iacovou 1995). Table 4.7 shows the response of study participants regarding unavailability of financial resources.

Table 4.7 financial resources

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
Implementing technological innovation requires high investment cost.	21	24	31	132	97	3.85	1.16
	6.9%	7.9%	10.2%	43.3%	31.8%		

Source: own survey result computed in SPSS 26, 2022

As the above table shows, the majority of the respondents agree (44.6%) and strongly agree (38.4%) as implementing technological innovation requires high investment cost having the mean score of 3.85 and standard deviation of 1.16. The finding result of the study shows that the lack of financial resources hinders the adoption of digital banking services.

4.3.2.2. Human resources

In addition to financial resources, human resources also important factors in adoption of new technology. The results of the study presented in table 4.8 regarding human resources on adoption of e- banking services.

Table 4.8 Human resources factors

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
Banks require skilled human resource in order to implement digital banking.	-	8	5	168	124	4.34	0.64
	-	2.6%	1.6%	55.1%	40.7%		
Banks require skilled IT personnel's in implementing technological innovation.	-	11	19	154	121	4.26	0.73
	-	3.6%	6.2%	50.5%	39.7%		
Technical and managerial skills of staffs on using technological innovation have influence on adoption digital banking.	-	-	9	146	150	4.46	0.56
	-	-	3%	47.9%	49.2%		

Unavailability of competent and skilled employee in related with digital banking is the challenge for banks to practice digital banking.	10	14	17	134	130	4.18	0.96
	3.3%	4.6%	5.6%	43.9%	42.6%		

Source: own survey result computed in SPSS 26, 2022

Result reported on the above table shows that more than 90% of the respondent agree as banks require skilled human resource in order to implement digital banking (mean score of 4.34 and standard deviation of 0.64) and Banks require skilled IT personnel's in implementing technological innovation with the mean of 4.26 and standard deviation of 0.73 .similarly more than 90% of the respondent agree as technical and managerial skills of staffs on using technological innovation have influence on adoption digital banking (mean of 4.46 and standard deviation of 0.56) and unavailability of competent and skilled employee in related with digital banking is the challenge for banks to practice digital banking with the mean of 4.18 and standard deviation of 0.96

As the above survey indicates that human resource has a significant impact on adoption of digital banking.

4.3.3. Technological factors

Results obtained from survey respondents of five selected bank digital banking employees regarding factors affecting the adoption of digital banking under determinant technological factors that focus mainly on perceived risk and perceived usefulness aspects of the service are depicted below using descriptive statistics: -

4.3.3.1. Perceived risk

The perception of the risks regarding e-banking is expected to influence adoption and further growth. Table 4.- shows participant responses on perceived risk of e-banking service.

Table 4.9 perceived risk.

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
Security aspects considered as barrier for implementing of digital Banking.	12 3.9%	9 3%	10 3.3%	140 45.9%	134 43.9%	2.17	1.34
Customers do not trust the technology of digital banking.	38 12.5%	20 6.6%	9 3%	172 56.4%	66 21.6%	3.8	1.26
Customers fear risk of new technology innovation.	30 9.8%	33 10.8%	8 2.6%	131 43%	103 33.8%	2.21	1.32
Customers do not trust the technology provided by the banks	31 10.2%	21 6.9%	12 3.9%	187 61.3%	54 17.7%	2.24	1.28

Source: own survey result computed in SPSS 26, 2022

As the above table indicates that the respondents were agree and strongly agree with Security aspects considered as barrier for implementing of digital banking with the mean score of 2.17 and standard deviation of 1.34, Customers do not trust the technology of digital banking is also barrier for proper digital banking adoption with mean of 3.8 and standard deviation of 1.26, Customers fear risk of new technology innovation is barrier for adoption of digital banking with mean of 2.21 and standard deviation of 1.32 and similarly the response of respondents as shown on the above table Customers do not trust the technology provided by the banks is another factor for digital banking adoption with the mean of 2.24 and standard deviation of 1.28. Moreover, interview with digital banking department manager also support the result of questionnaires and indicate that all factors in this category have significant impact on adoption of the digital banking service. Accordingly, they also suggest that creating good awareness to the customer of the bank on how the risk associated with digital banking adoption is mitigated may build their trust and confidence that ultimately reduce perceived risk towards digital banking services provided by the bank.

Therefore, this study find out that Lack poor physical security are the major factors faces the banking industry in adopting digital banking service. The study result appeared to be somehow consistent with the findings of **Sathye (1999); Howcroft et al. (2002); Poon (2008); Aldas-Manzano et al. (2009); and Chong et al. (2010), who found security concerns to be the major factor discouraging the adoption of E-banking services. Moreover, the result is consistent with the findings of Khalfan et al. (2006), Wondwossen and Tsegai (2005), Atinkut (2018) Zhao et al. (2010), and that of Laukkanen (2008).**

4.3.4. Perceived Usefulness

Perceived usefulness has long been found to have a significant influence on attitude and intention to use or adopt an innovation (Yuttapong et al., 2009; Sheikhshoaei and Oloumi, 2011; Zhou, 2011). It is the extent to which a user believes that a particular system would improve their performance (Hosein, 2010). Table 4.12 shows the result of the study with regards to perceive usefulness of e- banking.

Table 4.10Perceived usefulness.

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
E- Banking services are convenient in terms of time saving.	13	16	17	199	60	3.91	0.92
	4.3%	5.2%	5.6%	65.2%	19.7%		
E-banking services are accessible without time limit.	16	25	9	148	107	4	1.09
	5.2%	8.2%	3%	48.5%	35.1%		

Source: own survey result computed in SPSS 26, 2022

Results reported in the above table the respondents agree and strongly agreed as e- banking service is convenient in terms of time saving mean 3.91 and standard deviation value of 0.92 and similarly they agree and strongly agree E-banking services are accessible without time limit mean 4 and standard deviation of 1.09. This result implies, that using e- banking system helps to perform banking activities within a short period of time. This was in line with the study of Karjaluoto et al. (2002), which identifies time saving as a major benefit of adopting online banking system (Ayana, 2012).

4.3.5. Demographical factors

Results obtained from survey respondents of five selected sample bank digital banking employees regarding factors affecting the adoption of digital banking under determinant demographical factors that focus mainly on age, gender and educational level are depicted below using descriptive statistics: -

Table 4.11 Demographical factors

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
Relatively Male customers of the bank use E- banking services than female.	36	28	14	125	102	3.75	1.32
	11.8%	9.2%	4.6%	41%	33.4%		
High rates of illiteracy affect the easy practice of E-banking.	12	14	20	144	115	4.1	0.99
	3.9%	4.6%	6.6%	47.2%	37.7%		
Young customers of the bank use e- banking services than old customers.	10	16	22	139	118	4.11	0.98
	3.3%	5.2%	7.2%	45.6%	38.7%		
Customers level of education affect the adoption of e-banking.	7	10	18	127	143	4.28	0.89
	2.3%	3.3%	5.9%	41.6%	46.9		

Source: own survey result computed in SPSS 26, 2022

Result obtained from the above table shows that, the respondents asked on the demographical factors Relatively Male customers of the bank use E- banking services than female and 74.4 % of the respondents agree and strongly agree as male customers of the bank use e-banking product than females with mean value of 3.75 and standard deviation of 1.32 , 84.9% of the respondents agree and strongly agree as high rates of illiteracy affect the easy practice of E-banking with mean value of 4.1 and standard deviation 0.99 , 84.3% of the respondents agree and strongly agree as Young customers of the bank use e- banking services than old customers with the mean value of 4.11 and standard deviation of 0.98 and 88.5% of the respondent agree and strongly agree as Customers level of education affect the adoption of digital banking service with the

mean value of 4.28 and standard deviation value of 0.89 , therefore demographic factors is found to be one of the major factor that hinder adoption of digital banking in the country. The study results are consistent with the findings of **Tater et al. (2011), Izogo (2012), Alafeef et al. (2011) and Margaret et al. (2013), Abenet (2010), Atinkut (2018) Poon WC (2008) and Azouzi D (2009), Muzividzi et al. (2013) and Azouzi (2009)** who found demographical factors such as gender, age, and education level have an effect in adoption of E banking in Ethiopian industry.

4.4. Likelihood of digital banking Adoption

The respondents were asked to state to what extent their use of digital banking to consider adopting digital banking. The results are shown in table.

Table 4.12 likelihood of adopting digital banking.

Factors	SD 1	D 2	N 3	A 4	SA 5	Mean	Std Dev.
I have used electronic banking.	-	3	6	155	141	4.42	0.59
	-	1%	2%	50.8%	46.2%		
I strongly recommend the use of electronic banking.	8	17	21	130	129	4.16	0.96
	2.6%	5.6%	6.9%	42.6%	42.3%		
I will increase my use of electronic banking.	5	11	24	133	132	4.23	0.87
	1.6%	3.6%	7.9%	43.6%	43.3%		

Source: own survey result computed in SPSS 26, 2022

As the above table show that more than 95% of digital banking employees have used electronic banking with mean value of 4.42 and standard deviation 0.59 and 84.9% of the respondent strongly recommend the use of electronic banking with mean of 4.16 and std dev. Of 0.96.

Moreover, the majority of the respondents agree they will increase their use of e- banking with the mean of 4.23 standard deviation of 0.87. The study results shows that majority of digital banking employees use e- banking due to their awareness on the benefits of digital banking services.

4.5. Normality test

Table 4.13 summary of Normality test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Lack of awareness=MEAN(AWBS1,AWDB2)	.245	305	.000	.891	305	.000
Environmental factors=MEAN(EFs1,EFs2,EFs3,EFs4,EFs5,EFs6,EFs7,EFs8,EFs9,EFs1'N++0)	.068	305	.002	.990	305	.032
Organizational factors=MEAN(OF1,OF2,OF3,OF4,OF5)	.138	305	.000	.960	305	.000
Technological factors=MEAN(TF1,TF2,TF3,TF4,TF5,TF6)	.123	305	.000	.956	305	.000
Demographical factors=MEAN(DF1,DF2,DF3,DF4)	.152	305	.000	.950	305	.000

Source: own survey result computed in SPSS 26, 2022

Lilliefors Significance Correction

The above table presents the results from two well-known tests of normality, namely the Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. We Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 samples) but can also handle sample sizes as large as 2000. For this reason, we will use the Shapiro-Wilk test as our numerical means of assessing normality. If $p < 0.05$, reject the H0 because the test is significant. In our survey result $p < 0.05$ due to these we reject H_0 and accept HA.

4.6. Multicollinearity test

Multicollinearity is viewed here as an interdependency condition. It is defined in terms of a lack of independence, or of the presence of interdependence – signified by high inter correlations within a set of variables, and under this view can exist quite apart from the nature, or even the

existence of a dependency relationship between X and a dependent variable Y. Multicollinearity is not important to the statistician for its own sake. Its significance, as contrasted with its definition, comes from the effect of interdependence in X on the dependency relationship whose parameters are desired. Multicollinearity constitutes a threat -- and often a very serious threat -- both to the proper specification and to the effective estimation of the type of structural relationships commonly sought through the use of regression techniques.

Table 4.14 Summary of Multicollinearity test

Coefficients[a]

		Unstandardized cofficents		standardized coffiecents	t	sig	Collinearity Statistics	
Model		B	Std error	Beta			Tolerance	VIF
1	constant	4.961	.502		9.877	.000		
	Lack of awareness	-.064	.040	-.091	-1.583	.115	.994	1.006
	Environmental factors	.011	.076	.009	.147	.883	.983	1.017
	Organizational factors	-.070	.072	-.056	-.964	.336	.994	1.006
	Technological factors	-.039	.060	-.037	-.646	.519	.986	1.014
	Demographical factors	-.017	.059	-.017	-.290	.772	.987	1.013

Source: own survey result computed in SPSS 26, 2022

a. Dependent Variable: Adoption of e-banking

If tolerance is more than 0.2 and variance inflation factor (VIF) less than 10 there is no Multicolinarity problem. So, the result of the above table results show tolerance greater than 0.2 and VIF less than 10 and it is no Multicolinarity problem.

4.7. Kurtosis and Skewness

As Field (2009) and Garson (2012) noted, many statistical procedures assumed that the sampling distribution is normally distributed and so, if the sample data are approximately normal then the sampling distribution will be also. In this regard, it is useful to test for normality of the sample data. Therefore, it was checked for the data to see if they are normally distributed through quantified aspects of a distribution (i.e., skewness and kurtosis) and presented as follows.

Table 4.15 Tests of Kurtosis and Skewness

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Lack of awareness	305	.816	.140	.064	.278
Environmental factors	305	-.059	.140	-.266	.278
organizational factors	305	-.457	.140	-.246	.278
Technological factors	305	-.737	.140	.735	.278
demographical factors	305	-.684	.140	-.798	.278
Adoption of e banking	305	-.608	.140	.693	.278
Valid N (list wise)	305				

Source: own survey result computed in SPSS 26, 2022

According to Garson (2012), as a rule of thumb, for normality skew should be within the +2 to -2 range, when the data are normally distributed. Some statisticians also prescribe +1 to -1 as a more stringent criterion when normality is critical. In this regard, as shown in the above table, the skew value is perfectly fit within the limit and ranges between -0.059 and .816 Thus, in this research, is said to be within an acceptable range from normally distributed.

Furthermore, as Garson (2012) suggests, kurtosis should be within the +2 to -2 range when the data are normally distributed, while some statisticians prescribe +1 to -1 as a more stringent criterion when normality is critical. Taking both options in to consideration, when we look at table 4.15, the kurtosis value is perfectly fit within the limit and ranges between -0.798 and 0.698 Therefore, it can be explained that data distribution can be within acceptable range or normally distributed.

4.8. Correlation Analysis

Correlation Analysis is a measure of association between two continuous variables. Correlation measures both the size and direction of relationships between two variables. The squared correlation is the measure of the strength of the association (Tabachnick and Fidell, 1989). Correlation analysis is the relationship between two variables. The value of correlation “r” value is always in between minus one and plus one (-1 and +1). The sign of the correlation coefficient

determines whether the correlation is positive or negative. The magnitude of the correlation coefficient determines the strength of the correlation.

Correlations

correlations							
		AW	EF	OF	TF	DF	AD
AW	Pearson Correlation	1	-.046	.012	.044	-.015	-.048
	Sig. (2-tailed)		.423	.838	.448	.800	.408
	N	305	305	305	305	305	305
EF	Pearson Correlation	-.046	1	-.014	-.130*	.108	-.033
	Sig. (2-tailed)	.423		.809	.023	.059	.568
	N	305	305	305	305	305	305
OF	Pearson Correlation	.012	-.014	1	.016	.041	-.108
	Sig. (2-tailed)	.838	.809		.785	.478	.060
	N	305	305	305	305	305	305
TF	Pearson Correlation	.044	-.130*	.016	1	-.050	-.083
	Sig. (2-tailed)	.448	.023	.785		.388	.149
	N	305	305	305	305	305	305
DF	Pearson Correlation	-.015	.108	.041	-.050	1	.033
	Sig. (2-tailed)	.800	.059	.478	.388		.566
	N	305	305	305	305	305	305
AD	Pearson Correlation	-.048	.330	.708	.830	.033	1
	Sig. (2-tailed)	.408	.568	.060	.149	.566	
	N	305	305	305	305	305	305

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.16 Correlation Analysis

correlations							
		AW	EF	OF	TF	DF	AD
AW	Pearson Correlation	1	-.046	.012	.044	-.015	-.048
	Sig. (2-tailed)		.423	.838	.448	.800	.408
	N	305	305	305	305	305	305
EF	Pearson Correlation	-.046	1	-.014	-.130*	.108	-.033
	Sig. (2-tailed)	.423		.809	.023	.059	.568
	N	305	305	305	305	305	305

OF	Pearson Correlation	.012	-.014	1	.016	.041	-.108
	Sig. (2-tailed)	.838	.809		.785	.478	.060
	N	305	305	305	305	305	305
TF	Pearson Correlation	.044	-.130*	.016	1	-.050	-.083
	Sig. (2-tailed)	.448	.023	.785		.388	.149
	N	305	305	305	305	305	305
DF	Pearson Correlation	-.015	.108	.041	-.050	1	.033
	Sig. (2-tailed)	.800	.059	.478	.388		.566
	N	305	305	305	305	305	305
AD	Pearson Correlation	-.480	.330	.708	.830	.033	1
	Sig. (2-tailed)	.408	.568	.060	.149	.566	
	N	305	305	305	305	305	305

*. Correlation is significant at the 0.05 level (2-tailed)

Source: own survey result computed in SPSS 26, 2022

Correlation is significant at the 0.05 level (2-tailed).

There are no hard and fast rules for describing correlation strength; hesitatingly offer these guidelines:

$0 < |r| < 0.3$ weak correlation

$0.3 < |r| < 0.7$ moderate correlation

$|r| > 0.7$ strong correlation

From the above correlation matrix adoption of digital banking have positive and negative correlation with the entire variables i.e. adoption of digital banking positive moderately correlate with demographic factors and environmental factors and positive and significant relationship with technological factors and organizational factors but lack of awareness have negative correlation with adoption of digital banking

4.9. Regression Analysis

Regression analysis is a mathematical measure of the average relationship between two or more variables in terms of the original units of the data. Regression clearly indicates the cause-and-effect relationship between the variables. In regression, the variable corresponding to cause is taken as an independent variable and the variable corresponding to effect is taken as dependent variable. The results of data analysis are presented in the thesis. Regression analysis is the

relationship between dependent variable and independent variable. The regression equation is y = a0 + b1 X, where y is the dependent variable, a0 is constant, b1 is slope of the regression line, X is independent variable. Below are the results of the several tests conducted with the help of regression analysis.

Regression Analysis: Lack of awareness factors

Hypothesis 1: there is a relationship between lack of awareness and adoption of digital banking services is not supported.

Model Summary

Table 4.17 Regression Analysis Lack of awareness factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.048[a]	.002	.001	.73003

Source: own survey result computed in SPSS 26, 2022

Predictors: Adoption of digital banking

The result summary table 4.17 shows that value of R=0.048 which is less than 0.50 indicates that there is poor correlation between the dependent variable and the independent variable (Awareness) with effect on the dependent variable 0.048% (R-Square=.002).

The ANOVA table here below shows that there is no relationship between adoption of E Banking and awareness factors as the result of significant value or P value is less than 0.05.

Table 4.18 ANOVA Lack of awareness factors

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3067.586	1	3067.586	4235.684	.000[c]
	Residual	220.164	304	.724		
	Total	3287.750[d]	305			

Source: own survey result computed in SPSS 26, 2022

Dependent Variable: lack of awareness

Predictors: Adoption of digital banking

Regression Analysis: Environmental factors

Hypothesis 2 there is the relationship between environmental factors and adoption of digital banking services is supported.

Model Summary

Table 4.19 Regression Analysis Environmental factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.984a	.968	.967	.50433

Source: own survey result computed in SPSS 26, 2022

Predictors: Adoption of digital banking

The result summary table 4.19 shows that value of R=0.984 which is greater than 0.50 indicates that there is a good correlation between the dependent variable and the independent variable (Environmental factors) with effect on the dependent variable 0.984% (R-Square=.968).The ANOVA table here below shows that there is a relationship between adoption of E Banking and environmental factors as the result of significant value or P value is less than 0.05.

Table 4.20 ANOVA Environmental factors

ANOVA a						
1	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	2308.869	1	2308.869	9077.713	.000[c]
	Residual	77.321	304	.254		
	Total	2386.190[d]	305			

a. Dependent Variable: environmental factors
b. Predictors: Adoption of digital banking

Regression Analysis: Organizational factors

Hypothesis 3 there is the relationship between organizational factors and adoption of digital banking Services is supported.

Model Summary

Table 4.21 Regression Analysis Organizational factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.988[a]	.976	.976	.65981

Source: own survey result computed in SPSS 26, 2022

a. Predictors: Adoption of digital banking

The result summary table 4.21 shows that value of R=0.988 which is greater than 0.50 indicates that there is a good correlation between the dependent variable and the independent variable (Organizational factors) with effect on the dependent variable 0.988% (R-Square=.976).

The ANOVA table here below shows that there is a relationship between adoption of E Banking and organizational factors as the result of significant value or P value is less than 0.05.

Table 4.22 ANOVA Organizational factors

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5346.453	1	5346.453	12280.778	.000[c]
	Residual	132.347	304	.435		
	Total	5478.800[d]	305			

Source: own survey result computed in SPSS 26, 2022

Regression Analysis: Technological factors

Hypothesis 4 there is the relationship between technological factors and adoption of digital banking services is supported.

Model Summary

Table 4.23 Regression Analysis Technological factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985[a]	.969	.969	.68700

Source: own survey result computed in SPSS 26, 2022

Predictors: Adoption of digital banking

The result summary table 4.23 shows that value of R=0.985 which is greater than 0.50 indicates that there is a good correlation between the dependent variable and the independent variable (Technological factors) with effect on the dependent variable 0.985% (R-Square=.969).

The ANOVA table here below shows that there is a relationship between adoption of E Banking and organizational factors as the result of significant value or P value is less than 0.05.

Table 4.24 ANOVA Technological factors

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4534.829	1	4534.829	9608.444	.000[c]
	Residual	143.477	304	.472		
	Total	4678.306[d]	305			

Dependent Variable: technological factors

Predictors: Adoption of digital banking

Regression Analysis: Demographic factors

Hypothesis 5 there is the relationship between demographical factors and adoption of digital banking services is supported.

Table 4.25 Regression Analysis Demographic factors

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985[a]	.971	.971	.70047

Source: own survey result computed in SPSS 26, 2022

[a] Predictors: Adoption of digital banking

The result summary table 4.25 shows that value of R=0.985 which is greater than 0.50 indicates that there is a good correlation between the dependent variable and the independent variable (Demographical factors) with effect on the dependent variable 0.985% (R-Square=..970).

The ANOVA table here below shows that there is a relationship between adoptions of E Banking And Demographical factors as the result of significant value or P value is less than 0.05.

Table 4.26 ANOVA Demographic factors

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4954.653	1	4954.653	10098.019	.000[c]
	Residual	149.159	304	.491		
	Total	5103.813[d]	305			

Source: own survey result computed in SPSS 26, 2022

a. Dependent Variable: demographical factors

b. Predictors: Adoption of digital banking

Table 4.27 Regression Analysis summary

Regression Analysis: Summary of variables that affect adoption of digital banking

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate
1	.991[a]	.982	.981	.58617

Source: own survey result computed in SPSS 26, 2022

a. Predictors: (Constant), technological factors, environmental factors, demographical factors, organizational factors, lack of awareness

b. Dependent Variable: adoptions of digital Banking

The result summary table 4.27 shows that value of R=0.991 which is greater than 0.50 indicates that there is a good correlation between the dependent variable and the independent variable with effect on the dependent variable 98.2% (R-Square=.982).

The ANOVA table here below shows that there is a relationship between adoption of digital banking and independent variables as the result of significant value or P value is less than 0.05.

Table 4.28 ANOVA summary

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5545.143	5	1109.029	3227.702	.000[c]
	Residual	103.079	300	.344		
	Total	5648.222[d]	305			

Source: own survey result computed in SPSS 26, 2022

a. Dependent Variable: Adoption of digital banking

b. Predictors: demographical factors, lack of awareness, environmental factors, technological factors organizational factors.

Table 4.29 Digital Banking Adoption Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.961	.502		9.877	.000
	lack of awareness	.044	.045	.034	.999	.319
	Environmental factors	.334	.079	.217	4.224	.000
	Organizational factors	.338	.069	.333	4.930	.000
	Technological factors	.229	.062	.209	3.716	.000
	Demographical factors	.215	.062	.205	3.490	.001

Source: own survey result computed in SPSS 26, 2022

Dependent Variable: Adoption of digital banking

The above coefficient model table reports coefficients for technological factors, environmental factors, and organizational factors, lack of awareness, and demographic factors along with the significance value. The model Coefficients are used in the construction of regression equation. A low significance value of less than 0.05 for technological factors, environmental factors, organizational factors, and demographic factors indicates that there is a strong relationship

between independent factors and adoption of digital banking. The regression equation for the above data is: Adoption of digital banking = 4.961-0.044 (0.034) -+0.334 (0.217) +0.338 (0.333) +0.229 (0.209) + 0.215(0.205). The above equation is the calculated contribution for the tested elements to adoption of digital banking. From the regression equation it is observed that all the factors have a negative impact on adoption of digital banking.

Questionnaires and interviews collected and analyzed from the sample population on the five main factors that affect digital banking adoption in Ethiopian banking industry show as all factors (lack of awareness, environmental factors, organizational factors, technological factors and demographical factors) affect adoption of digital banking in Ethiopian banking industry.

Even though all factors (lack of awareness, environmental factors, organizational factors, technological factors, and demographical factors) affect adoption of digital banking in Ethiopian banking industry the effect of environmental factors and organizational factors is higher than the other factors.

UNIT FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary of Findings

The purpose of this study was to assess factors affecting adoption of digital banking in Ethiopian banking industry in case of five selected commercial banks; Awash Bank (AB), Bank of Abyssinia (BOA), Dashen Bank (DB), Commercial Bank of Ethiopia (CBE) and Zemen Bank (ZB).The researcher used questionnaires and interviews to collect data on factors affecting adoption of digital banking in Ethiopian Banking industry and the detail of this data was analyzed in chapter four.

Most factors in adopting digital banking system in this study come from the external environments like; lack of ICT infrastructure , poor network and internet connectivity, lack of legal framework that enforce banking industries to adopt such technological innovation, lack of sufficient government support and absence of competition from foreign banks.

Organizational factors like financial and human resources lack of skilled human resource is also affect adoption of digital banking.

The researcher employed exploratory and descriptive methods of data analysis and the result of the study was described in table by using percentage, mean and standard deviation.

The correlation analysis revealed that, adoption of digital banking positive moderately correlate with demographic factors and environmental factors and positive, significant, and strong correlation with technological factors and organizational factors however lack of awareness has negative correlation with adoption of digital banking.

The regression analysis showed that the independent variables had a significant effect on digital banking adoption except lack of awareness factors and all hypothesis is supported except lack of awareness factors.

5.2. Conclusion

Based on the results discussed in chapter four even though the national ict infrastructure development is poor, mobile and internet data connection is poor , regulatory policies on digital banking is not good and supportive , the literacy level of the society is poor, lack of foreign bank competition, adoption of digital banking requires huge investment and government support for digital banking adoption is minimal, the banking sector in our country is slowly adopting the digital banking system to tackle the challenges as well as to seize the opportunities offered by digital technology to quickly shape and conquer the market.

In general, the findings of the study identified factors affecting the adoption of digital banking in Ethiopian Banking industry. Digital banking adoption barriers identified in this study may help the bank to easily know the best alternative course of actions to enhance the development of digital banking adoption.

5.3. Recommendations

Based on the above conclusion the researcher reached the researcher recommends the following key points that will help the Ethiopian banking industry to minimize the factors that affecting adoption of digital banking.

- The Bank should have to discuss with Ethio telecom and the new entrant telecom company to launch and expand the proper telecom (ICT) infrastructure which enables the bank to properly deliver their digital banking services in particular and to create digital society in general.
- The bank should have to discuss with different public agencies, government institutions, corporations, share companies and plcs' to receive digital receipt and to collect their payment through in noncash way.
- Banks should continuously perform digital banking awareness creation to different target customers and make their digital banking service simpler and easily adaptable to the customer.
- Banks should have to provide proper training and development to their digital banking employees to easily adopt and nurture digital banking products.
- Banks should aggressively work on digital banking services to take advantage on technology-based competition focusing on, customer expansion, cost reduction, awareness creations, credibility, security, ease of use, and availability in their endeavor.

- Banks should promote their digital banking services in different media which are convenient to reach their customers.
- Banks should have to push NBE for comprehensive regulatory framework on the adoption and use of current digital banking

5.4. Limitations and directions for future study

This research project was conducted of factors affecting adoption of digital banking in Ethiopian banking industry in five selected banks digital banking employees found in Addis Ababa. The major limitations include:

- Exclusion of other banks
- Exclusion of other employees out of digital banking department
- Exclusion of digital banking employees out of Addis Ababa
- Exclusion of digital banking customers
- Exclusion of banks customers that don't use digital banking services.

Thus, future researchers should consider these limitations as an opportunity and should, therefore, include the views of other banks digital banking employees, non-digital banking employees, digital banking employees out of Addis Ababa and digital banking customers and non-digital banking customers.

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APPENDICES

Questionnaire

Dear Respondent,

I am a graduate student at Saint Merry University. I am undertaking a survey on **factors affecting the Adoption of Digital Banking in Ethiopian Banking Industry**, in partial fulfillment of the requirement for the award of a Master of Art (MA) in Master of Business Administration (MBA).

Therefore i kindly request your kind assistance in completing the attached questionnaire to the best of your knowledge. The information you give will be treated confidentially and is solely will be used for academic purposes. A copy of the final report will be availed to you upon request. I would like to express my sincere appreciation for your time, honest and prompt responses.

Thank you.

Kebadu Muluken

For further information please contact me.

Telephone **0910452130**

Email **kebemuluken@gmail.com**.

General Instructions

- *no need of writing your name.*
- *for questions that demand your opinion, please try to honestly describe your responses on the space provided.*

Part I: Demographic Details

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

1. Gender:

Male ☐ Female ☐

2. Age:

Below 20 ☐

20 to 30 years ☐ 31 to 40 years ☐

41 to 50 years ☐ above 50 years ☐

3. Educational level:

Grade 12 and below ☐ Master's Degree ☐

Diploma holder ☐ Above Master's Degree ☐

First degree holder ☐

Part II: Factors affecting adoption of digital banking in Ethiopian banking industry.

Below are lists of statements pertaining to factors affecting adoption of digital banking? Please indicate by circling your choices from the options that range from strongly agree to strongly disagree.

1 Strongly Disagree (**SD**) **2**-Disagree (**D**) **3**- Neutral (**N**) **4**- Agree (**A**) **5**- Strongly Agree (**SA**)

	1. AWARNESS	**SD**	**D**	**N**	**A**	**SA**
		1	**2**	**3**	**4**	**5**
AW1	I have enough knowledge and skill about digital banking services.	**1**	**2**	**3**	**4**	**5**
AW2	The bank provides help (demo) on its website to use digital banking.	**1**	**2**	**3**	**4**	**5**
	2. ENVIROMENTAL FACTORS					
EF1	My bank has adequate ICT infrastructure to conduct digital banking.	**1**	**2**	**3**	**4**	**5**
EF2	The quality of internet connection and mobile network significantly affects digital banking.	**1**	**2**	**3**	**4**	**5**
EF3	Ethio Telecom provided high speed internet and mobile connection.	**1**	**2**	**3**	**4**	**5**
EF4	My bank has regulatory guidelines on digital banking.	**1**	**2**	**3**	**4**	**5**
EF5	It is difficult to perform digital banking because of absence of suitable legal and regulatory framework for e-commerce and e-payment.	**1**	**2**	**3**	**4**	**5**
EF6	The Government promotes digital banking for its citizens.	**1**	**2**	**3**	**4**	**5**
EF7	The government providing necessary infrastructural facilities (road, electric power, telecommunication and etc) to remote area of the country in order to facilitate digital banking adoption.	**1**	**2**	**3**	**4**	**5**
EF8	The Government institutions, public agencies, share companies, plc.'s can easily accept digital banking payment advices generated by digital banking users	**1**	**2**	**3**	**4**	**4**

EF9	There is high competition between local banks on digital banking services.	**1**	**2**	**3**	**4**	**5**
EF10	Absence of competition from foreign banks has influence on digital banking.	**1**	**2**	**3**	**4**	**5**
	3. ORGANIZATIONAL FACTORS					
OF1	Implementing technological innovation requires high Investment cost.	**1**	**2**	**3**	**4**	**5**
OF2	Banks require skilled human resource in order to implement digital banking.	**1**	**2**	**3**	**4**	**5**
OF3	Banks require skilled IT personnel's in implementing technological innovation.	**1**	**2**	**3**	**4**	**5**
OF4	Technical and managerial skills of staffs on using technological innovation have influence on adoption digital banking.	**1**	**2**	**3**	**4**	**5**
OF5	Unavailability of competent and skilled employee in related with digital banking is the challenge for banks to practice digital banking.	**1**	**2**	**3**	**4**	**5**
	4. TECHNOLOGICAL FACTORS					
TF1	Security aspects considered as barrier for implementation of digital Banking.	**1**	**2**	**3**	**4**	**5**
TF2	Customers do not trust the technology of e- banking.	**1**	**2**	**3**	**4**	**5**
TF3	Customers fear risk of new technology innovation.	**1**	**2**	**3**	**4**	**5**
TF4	Customers do not trust the technology provided by the banks	**1**	**2**	**3**	**4**	**5**
TF5	E- Banking services are convenient in terms of time saving.	**1**	**2**	**3**	**4**	**5**
TF6	E-banking services are accessible without time limit.	**1**	**2**	**3**	**4**	**5**
	5. DEMOGRAPHIC FACTORS					
DF1	Relatively Male customers of the bank use E- banking services than female.	**1**	**2**	**3**	**4**	**5**
DF2	High rates of illiteracy affect the easy practice of E-banking.	**1**	**2**	**3**	**4**	**5**
DF3	Young customers of the bank use e- banking services than old Customers.	**1**	**2**	**3**	**4**	**5**
DF4	Customers level of education affect the adoption of e- banking.	**1**	**2**	**3**	**4**	**5**

6. ADOPTION			**1**	**2**	**3**	**4**
AD1	I have used electronic banking.	**1**	**2**	**3**	**4**	**5**
AD2	I strongly recommend the use of electronic banking.	**1**	**2**	**3**	**4**	**5**
AD3	I will increase my use of electronic banking.	**1**	**2**	**3**	**4**	**5**

Any Suggestions that you would like to give on digital banking?

Interview

Interview questions designed for the digital banking managers of the five selected banks.

1. In your opinion what are the major factors in your institution to practice digital banking.
2. From the factors you explained above which factors do you think highly affect the adoption of digital banking?
3. Do you think that government policy have impact on the practice of E- banking system? (Please Specify/explain)
4. What sort of support would you expect from the government in relation to the digital banking improvement in Ethiopia?
5. If you have a comment

_____

_____

_____

_____.