CHALLENGES OF REAL TIME GROSS SETTLEMENT IN ETHIOPIA BANKING INDUSTRY

(EVIDENCE FROM SELECTED PRIVATE COMMERCIAL BANKS)

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

BY

ELIAS LAKEW

ADVISOR

ASST. PROF. ABRAHAM G/GIORGIS

JUNE 2020 G.C

ADDIS ABEBA

ETHIOPIA.

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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFULIMENT OF THE REQUIRMENTS FOR MASTER OF BUSINESS ADMINSTRATION IN ACCOUNTING AND FINANCE

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APPROVED BY BOARD OF EXAMINERS

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DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Declared by:	Confirmed by Advisor:
Name: Elias Lakew	Name: Asst. Prof. Abraham G/Giorgis
Signature_____	Signature_____
Date_____	Date August 25,2020.

ENDORSEMENT

This is to certify that Elias Lakew Temesgen has carried out his research work on the topic entitled Assessment on the Challenges of Real Time Gross Settlement in Ethiopia Banking Industry (Evidence from Selected Private Commercial Banks. The work is original in nature and is suitable for the submission for the reward of MBA in Accounting and Finance.

Advisor: Asst. Prof. Abraham G/Giorgis 

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ACRONYMS & ABBREVIATIONS

ACH	Automated Clearing House
AIB	Awash Internal Bank S. Co
ATM	Automatic Teller Machine
DB	Dashen Bank S. Co.
E-Banking	Electronic Banking
E-Payment	Electronic Payment
EFT	Electronic Fund Transfer
FSA	Financial Services Authority
GTP	Growth and Transformation Plan
ICT	Information and Communication Technology
IDT	Innovation Diffusion Theory
IT	Information Technology
NBE	National Bank of Ethiopia
NIB	Nib International Bank S. Co
OECD	Organization for Economic Cooperation and Development
POS	Point of Sale
PIN	Personal Identification Number
RTGS	Real Time Gross Settlement System
SPSS	Statistical Package for Social Science
TAM	Technology Acceptance Model
TOE	Technology-Organization-Environment framework
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
VISA	Visa International Service Association
UN	United Bank S. Co.
WB	Wegagne Bank S. Co.
ZB	Zemene Bank S. Co.
7X24	7 days and 24 hours

ABSTRACT

The study assesses the adoption and development of Real Time Gross Settlement(RTGS) transfer technology in the Ethiopian banking industry. Population of the study consist all 18 commercial banks that currently operated in 2020. The study was conducted based on the data gathered from 6 private commercial banks in Ethiopia using Purposive sampling method. Both quantitative and qualitative research or mixed research approach was employed to answer the research questions that emerge through the review of existing literature and the experiences of the researcher in respect of the RTGS transfer technology in Ethiopia. The study found that high cost of implementation of RTGS, lack of customer awareness, limitation in network infrastructure and internet related support services, low levels of computer literacy, legal and regulatory differences with cross-country security risk and lack of trust are the Challenges of RTGS adoption. The study identified operational benefits from developing of RTGS transfer technology such as increase productivity, reduces paper work, reduce transaction cost, increase reliability, reducing errors, facilitate development of new products reduce long queues in banking halls. Among the different driving forces that initiate Ethiopian banks to adopt and extend RTGS transfer technology; desire to improve performance, desire to improve the relationship with customers, rapidly changing customers' needs and preferences, desire to improve organizational performance, desire to build organizational reputation and desire to reduce transaction cost are among others. The study recommended banks to facilitate proper and continuous training for their employees, increasing security electronic transfers, create deep awareness about RTGS transfer technology to the community while the government should support banking sector by facilitating sufficient ICT infrastructure development and issue clear and workable legal frameworks to ease the adoption and growth of RTGS transfer Technology in Ethiopia.

Chapter One

1. Introduction

As an introduction of the study, this chapter presents, background of the study, statement of the problem, research objective, research questions, scope and limitation of the study and significances of research which about the challenges of Real Time Gross Settlement (RTGS) in Ethiopia banking industry.

1.1 Background of the Study

The development of new technologies, has fundamentally changed the way the banking products and services delivered. With promising fame and competition, most of the banks had to deploy ICT and introduce a branch banking commonly called E-banking in order to meet the challenges of the day. Not only with the willingness to introduce the technology but also the National Bank by a directive mandates every commercial bank to introduce core banking technologies. Through development new banking theologies, now a day, all private and government-owned banks inter-connected through core-banking systems and the inter-bank payment and settlement system which commonly called Real time gross settlement(RTGS) (Equbamariam, 2018).

RTGS is the electronic payment and settlement system for inter-bank transfers operated and owned by the National Bank of Ethiopia. Currently, all banks of the country including the NBE have payment and settlement account within the RTGS, and it is through this account that the large value interbank transfer is settled among banks, government institutions and any other institution to be prescribed by the NBE (Equbamariam, 2018).

RTGS is a service offered by the banks to process high value transactions safely between two accounts in different banks or continents. RTGS is a funds transfer systems where by money or securities are transferred from one bank to another on a real time and on gross basis. Settlement on real time means there is no waiting period and the payment is considered as final and irrevocable. Gross settlement transaction is settled on one to one batching basis without netting with any other transaction it can transfer up to huge amount of currency (Arnety, 2015).

RTGS is a recent introduced in Ethiopia as part of the modernization of the payment system. Currently, this payment system is used mainly for interbank fund transfer as well as for government up to large value fund transfers related with budget. All banks of the country including the NBE have payment and settlement account with in the RTGS, and it is through this account that currencies interbank transfer is settled (Nnaka, 2009).

Therefore, the purpose of this research is to assess the current practice and extent of RTGS service, benefits realized by banks as well as users of the bank services, driving forces, opportunities and challenges for the adoption of RTGS service in Ethiopia.

1.2 Problem of the Statement

RTGS is recently introduced system in Ethiopia as part of modernization of electronic payment system for inter-bank fund transfer and clearance. According to the researcher observation, RTGS currently working with limited site range, it works only in Addis Abeba city and CK-clearance form and to outstanding branches is not available and RTGS work only seven hours per a day from 02:00-09:00 local time with a lot of transaction failures. Those mentioned items challenges the RTGS system to full work at 7x24. Therefore, the need to explore the adequacy and the challenge of the current RTGS operation in the aforementioned problems initiates the researcher to conduct the study. Accordingly, the research analyzes the challenges of RTGS in Ethiopia banking industry.

A lot of researches conducted on the related topics by different researchers in Ethiopia. For example; - (Wondwossen & Tsegai, 2005) studied the main obstacles to the development of E-payments like ATM, mobile and internet banking are lack of customers trust in the initiatives, unavailability of payment laws and controlling system especially for E-payment, lack of skilled manpower and frequent power disruption. (Gardachew, 2010) conducted a research on the opportunities and challenges of E-banking in Ethiopia and he found that lack of suitable legal and regulatory frame works for E-commerce and E payments, political instability in neighboring countries, frequent power interruption, lack of trained personnel's in key organizations, high rates of illiteracy and absence of financial networks that links different banks are the major challenges.

(Bultum, 2014) studied factors that affect adoption of E-banking in the Ethiopian banking industry. The result of the study also indicated the major barriers Ethiopian banking industry faces in the

adoption of electronic banking are: security risk, lack of trust, lack of legal and regulatory frame work, lack of ICT infrastructure and absence of competition between local and foreign banks. And recently (Equbamariam, 2018) studied on limits of e-banking regulation in Ethiopia and found a limit that Ethiopia does not have a comprehensive primary legislation that regulates the E-banking business, but many issues of the e-banking business are regulated by the National Payment System Proclamation and its implementing directives. But the current regulations provided by the National Payment System proclamation and its implementing directives are not full-fledged.

The gap between the previous related studies and this study about challenges of RTGS is that previous researches focused on challenges of electronic banking technological tools like automatic teller machine(ATM), mobile banking, point of sale(POS) and internet banking challenge factors. However, this study focus recently launched payment and settlement system RTGS. Based on the researcher knowledge, there were no research made regard to challenges of RTGS in Ethiopia case. Therefore, the purpose of this paper was to study the challenges RTGS in Ethiopia banking industry.

1.3 Objectives of the Study

1.3.1 General Objective

➔ The main objective of the research is to study the challenges of Real Time Gross Settlement(RTGS) system in Ethiopian banking industry.

1.3.2 Specific Objectives

The specific objectives of the study are: -

➔To assess the challenge related with change encountered in the RTGS in Ethiopian banking industry.

➔To assess challenge related with the benefits realized by the banks in the RTGS system to complement their service delivery channels.

➔To examine the challenge related with the driving forces towards the adoption and development of RTGS service in Ethiopia; and

➔To assess the existing opportunities by relating with challenge of RTGS adoption and development in Ethiopia banking industry.

1.4 Research Questions

Based on the above stated objectives, the following research questions are going to be answered.

➔What are the challenges of adoption and growth of RTGS in the Ethiopian banking industry?

➔What are the challenges related with driving forces towards the adoption and development of RTGS in the Ethiopian banking industry?

➔What are the challenges regard to the benefits and existing opportunities for the adoption and development of0 RTGS in Ethiopia?

1.5 Scope of the Study

The study was limited to surveying, interviewing and documentary analysis of the purposely selected banks. Six private commercial banks were purposely selected and it excluded other banks to explore the intent of the study. Those six banks were selected from the total population based on their familiarity with E-banking technology i.e. long years' services in providing RTGS products to public.

1.6 Limitation of the study

The purposive sampling procedure decreases the generalizability of findings and this study might not be generalizable to all banks. Besides, the study was only to identify the adoption and development RTGS in the Ethiopian banking industry with respect to their challenges, benefits, driving forces and opportunity from the banks perspective. Thus, the study focused on the opinion of bank officials and does not include the customers or public opinion on the subject matter.

1.7 Significance of the Study

The purpose of the study is to assess the benefits realized by Banks, driving forces, challenges and opportunities for the adoption and development of RTGS in Ethiopia. In general, the study will have the following significances;

- ⇨ Provide an opportunity for decision-makers and managers of the Bank's to consider and evaluate the opportunities and problems observed in the existing practices, in order to take appropriate corrective measures in the area or to accelerate the positive factors (if any) for the promotion of RTGS practices.
- ⇨ The finding will provide a framework for the Banks for the design of their future directions and to adjust their goals and objectives as per real opportunities and challenges.
- ⇨ Since RTGS technology is in a Beginning or infant stage in Ethiopia, identification of opportunities and challenges for the adoption of RTGS can impact positively on the performance of banks.
- ⇨ The study will enable government organizations and trade associations to develop banks RTGS assistance programs that are designed to address the factors identified by this research. This study would also assist all stakeholders in the banking industry identify and formulate strategies that will promote E-banking.
- ⇨ There is no previous study specifically done on the adoption and challenges of RTGS so the study seeks to address the lack of studies in developing countries like Ethiopia. So it is significant to fill this gap and contributes by providing literature input for the further research.

1.8 Organization of the Study

The research report was organized into five chapters: Chapter one; introduction focuses on the background of the study, problem statement, objectives, questions and significant of the study. In chapter two; a range of literatures review is captured there to gather relevant information concerning RTGS and E-banking. In chapter three; detail of methodology followed to achieve results is outlined. It includes the study design, sampling, sampling technique and data analysis. Chapter four; contained results and discussion from the study supported with findings from other research works. Chapter five; focuses on findings, conclusions and recommendations of the study.

Chapter Two

2. Literature Review

The purpose of this chapter is to review the literature in the area of RTGS transfer adoption and development and mainly focused on the challenges, benefits and drivers of RTGS transfer technology. Since RTGS is one element in the e-banking (Nnaka, 2009), the researcher reviewed said with e-banking themes. So that the review of literature establishes a framework, which can guide the study.

The review has eight sections. Section 2.1, presents the evolution of RTGS followed by the definition of RTGS, in section 2.3. Innovation adoption and 2.5 theoretical review, 2.5 RTGS risk so as to make conceptual frame work used to guide the study. In section 2.6 empirical review, Finally, RTGS challenge and knowledge gap were presented in section 2.7 and 2.8 respectively.

2.1 Evolution of RTGS

In the last two decades National Bank of Ethiopia has made a number of initiatives towards modernization of payments and settlements systems. As part of the modernization of the payment system, the National Bank of Ethiopia introduces a national payment and settlement system called 'Ethiopian Automated Transfer System' (ETATS) on June 07, 2011. This payment and settlement system consists of Real Time Gross Settlement System (RTGS) and Automated Clearing House (ACH). RTGS is the electronic payment and settlement system for inter-bank transfers operated and owned by the National Bank of Ethiopia.44 RTGS is an online real time gross settlement system that processes high value and time-sensitive payment instructions among banks, government institutions and any other institution to be prescribed by the NBE.45 Currently, this payment system is used mainly for interbank fund transfer as well as for government large value fund transfers. All banks of the country including the NBE have 'payment and settlement account' within the RTGS, and it is through this account that the large value interbank transfer is settled (Equbamariam, 2018).

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banks of the country including the NBE have 'payment and settlement account' within the RTGS, and it is through this account that the large value interbank transfer is settled. With regard to electronic clearing system, the NBE has implemented the Automated Clearing House (ACH) system for the cheques clearing system as part of the RTGS. ACH facilitates interbank electronic debit clearing processing by receiving electronic journals and generating settlement entries, netting, and other clearing reports (Ayana, 2017).

2.2 Definition of RTGS

Different authors have defined it in different ways based on their understanding of the application of electronic transfer system like RTGS. The following are few of them.

In developmental study (Peter, 2009), Payment Systems development group of world's bank referred RTGS as settlement that plays an important role in the financial system by settlement of inter-bank financial transactions and holding transfer reserve balances of operating days through central bank's balance sheet deposits and loans account by affecting the size and composition.

Real Time Gross Settlement System (RTGS) is an inter-bank and inter-branch connection that has improved the 'bank-customer' network. In this system, the transactions are made on the real time basis when they occurred and gross based. (Dr. M.Vasan, 2018).

RTGS is the settlement for real-time interbank and customer payments and ancillary systems (AS) transfers. RTGS offers a wide range of features to execute real-time payments and AS transfers in an efficient manner for example reservations for purpose, priorities and optimization algorithms (Matthew, 2019).

RTGS as E-payment systems that used to automate processes of exchanging monetary value among parties in business transactions and transmitting this value in gross base and at real time over the Information and Communication Technology (ICT) networks. (Nnaka, 2009). In general, Real Time Gross Settlement(RTGS) is a term for the automated inter-bank transaction or transfer through reserve deposit of other commercial banks in central bank in real time. Therefore, the purpose of this research is to assess the current practice and extent of RTGS service, benefits realized by banks as well as users of the bank services, driving forces and challenges for the adoption of RTGS service in Ethiopia.

2.3 Innovation Adoption

Today the world is witnessing profound transformations and acceleration as a result of the tremendous development of information technology and steady growth of volume of information that has led to the emergence of new types of activities and transactions in various fields (Joseph, 2005). The banking sector has been one of the first area that adopted different electronic applications to improve performance and gain a competitive advantage strategy. In light of the extensive use of information and communication technologies, the financial services industry and banking has provided new systems and applications that maximizes the use of modern technology and are now available (Francis, 2014).

The rate of adoption is defined as the relative speed with which members of a social system adopt an innovation (Rogers, 1983), therefore, it has become necessary for banks to change the concept of traditional banking service to because of the rapid growth of electronic banking transfer services and ever increasing competition among banks to raise efficiency, reduce costs and attract more customers. (Francis, 2014).

2.4 Theoretical reviews

Researchers have been used different frameworks in the study of adopting new technological innovation. Among frameworks that have been developed in different studies includes, Technology-Organization-Environment (TOE) framework, Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Innovation Diffusion Theory (IDT) and Theory of Reasoned Action (TRA).

2.4.1 Technology- Organization- Environment (TOE) Framework.

TOE framework was developed 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, 2009, Ellis, 2009, Chang, 2007, Zhu & Kraemer, 2006). The technology adoption within an organization is influenced by factors pertaining to the technological context, the organizational context, and the external environment (Tornatzky & Fleischer, 1990).

➔ The technological factor refers to adopter's perception of E-banking attributes. Typical characteristics of technology considered in technology adoption studies are based on the assumption of Roger's diffusion of innovation Which include relative advantages (perceived benefits), and relative disadvantages (perceived risks). Technological factors include complexity, compatibility, relative advantage, ease of use and usefulness. The technological factors are related to challenges to technology adoption and its perceived benefits. The perceived benefits for manager could be direct, such as cost savings or income generation, or indirect, such as potential opportunities in new market, marketing, or publicity (Rogers, 2003).

➔ The organizational factor refers to the organizations characteristics that influence its ability to adopt and use of E-banking system. The organizational factors that have been mostly cited in literature include: Information Technology (IT) users' community; organizational structure; firm's process; firm size; technological capabilities of the organization's members; the technological and financial resources available; process of selecting and implementing the IT; management backing and support for the project (Harrison, 2012).

➔ The environmental factor refers to the external environment in which an organization operates and its condition for supporting the development of E-banking services. Environmental factors relating to IT adoption (and specifically the adoption of internet technologies) includes pressure from competitors, customers or suppliers; the role of government (incentives); partners, alliances; technological infrastructure; technology consultants; image of internet technology; and users expectations (Harrison, 2012).

2.4.2 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was introduced by (Davis, 1986) quoted in (Davis et al., 1989). Technology acceptance model is an adaptation of Theory of Reasoned Action (TRA), developed to specifically deal with modeling user acceptance of information systems. As compared to TRA, Technology Acceptance Model is significantly less general. The model was developed to particularly explain the computer usage behavior. But since, TAM includes findings collected from over a decade of Information System (IS) research, so it is particularly well-suited for modeling computer acceptance.

The Technology Acceptance Model (TAM) defines the casual relationship between perceived usefulness, ease of use, system design features, attitude towards using and actual usage behavior. In general, an informative representation of the mechanisms by which design choices influence user acceptance is provided by TAM. Hence, Technology acceptance model is useful in applied contexts for forecasting and evaluating user acceptance of information technology (Davis, 1993).

According to Technology Acceptance Model (TAM), perceived usefulness (PU) and perceived ease of use (PEOU) are two key beliefs that are mainly relevant for computer acceptance behavior. Theory of Reasoned Action (TRA) is used by TAM as a theoretical basis to specify causal association between these two key beliefs i.e. PU and PEOU. Perceived usefulness (PU) is defined as the degree to which a potential user thinks that using a particular system would increase his/her job performance. The term usefulness is derived from the word 'useful', which means the advantage of using particular IS. Whereas, perceived ease of use (PEOU) is defined as the degree to which a potential user thinks that using a particular system would be free of effort. The word 'ease' means, freedom form difficulty, hardship or effort. In short, ease of use means 'user-friendliness' of IS (Davis, 1989).

2.4.3 Theory of Planned Behavior (TPB)

TPB is developed originally based on the theory of reasoned action (TRA) which explains almost any human behavior. In predicting and explaining human behavior across various application contexts, it has been proven successful. According to TRA, a person's behavioral intention guides his actual behavior of performing some certain action and where subjective norm and attitude toward the behavior determine the behavioral intention (Liao et al., 2007).

According to (Ajzen, 1991) quoted in (Liao et al., 2007), "behavioral intention is a measure of the strength of one's willingness to try while performing certain behaviors". As in the original model of TRA, there are some limitations when dealing with behavior for which there is incomplete volitional control of people. Therefore, TPB is proposed to eliminate these limitations; and in fact, TPB differs from TRA because of the addition of perceived behavior control, which potentially effects behavioral intention.

According to (Ajzen, 1991), the theory of planned behavior proposes three independent determinants of intention which are attitude towards the behavior, subjective norm and perceived behavioral control. Attitude as defined by (Fishbein and Ajzen, 1975) quoted in (Liao et al., 2007), is "the degree of one's favorable or unfavorable evaluation of the behavior in question". The attitudes are developed reasonably from one's beliefs about object of the attitude. Subjective

Norm refers to "the perceived social pressure to perform or not to perform the behavior" (Ajzen, 1991) quoted in (Liao et al., 2007). It can be said that it is related to the normative beliefs about other people's expectations on either to perform or not to perform the behavior. Perceived behavioral control refers to ''people's perception of ease or difficulty in performing the behavior of interest" (Ajzen, 1991) quoted in (Liao, 2007) and is assumed to reflect past experiences as well as the predicted difficulties and barriers. The construct of the perceived behavioral control in the TPB is added to cope with the situations in which people may lack the complete volitional control over the behavior of interest.

Perceived behavioral Control is directly connected to the beliefs of the control factors that can facilitate or hinder the performance of the behavior (Ajzen, 2002) qouted in (Liao, 2007). Control factors can be referred to as the internal or external constraints where internal constraints are related to self-efficacy and external constraints to the environment (Ajzen, 2002) qouted in (Liao, 2007).

Generally speaking, the more favorableness and un-favorableness of the attitude, subjective norm and the higher perceived behavior control are directly proportional to the strength of one's intention to perform the behavior under consideration (Ajzen, 1991).

2.4.4 Innovation Diffusion Theory (IDT)

Innovation is defined "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995 p. 11), whereas diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995, p. 5). Therefore, Innovation Diffusion Theory (IDT) states how new ideas, concepts or technologies spread or become common in a society and adopted by users.

Innovation Diffusion Theory (IDT) includes fives characteristics. These characteristics as defined by (Rogers, 1995) are: -

➔Relative Advantage: "The degree to which an innovation is perceived to be better than the idea it supersedes".

➔Compatibility: "The degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters".

➔Complexity: "The degree to which an innovation is perceived as relatively difficult to understand and use".

➔Trial ability: "The degree to which an innovation may be experimented with on a limited basis".

➔Observability: "The degree to which the results of an innovation are visible to others".

The above mentioned characteristics, defined by (Rogers, 1995) greatly influence adoption. According to (Chen et al., 2000), among five characteristics of IDT, relative advantage, compatibility and complexity are the only attributes, which are consistently related to innovation adoption.

2.4.5 Theory of Reasoned Action (TRA)

The theory of reasoned action (Ajzen & Fishbein, 1980, Fishbein & Ajzen, 1975) quoted in Belleau (2007) is based on the assumption "that individuals are rational and make systematic use of information available to them".

According to theory of reasoned action, behavioral intention (BI) of an individual is a measure of the strength of one's intention to perform a specified behavior. BI is determined by two factors: 1) Attitude towards the behavior (AB), which is a function of beliefs (bi) that performing the behavior possesses certain attributes and the evaluation of those beliefs (EI) 2) Subjective Norm (SN), which is the perception of social groups i.e. what specific individuals or groups think that a person should or should not perform. (Belleau, 2007). "An individual's Subjective Norm (SN) is determined by a multiplicative function of his or her normative beliefs (NBI), i.e., perceived expectations of specific referent individuals or groups, and his or her motivation to comply (MCI) with these expectations" (Fishbein and Ajzen, 1975) quoted in (Davis, 1989). Apart from the above mentioned factors, (Ajzen and Fishbein, 1980) quoted in (Belleau, 2007) mentioned that some external variables might also have influence on behavioral intention, for instance, demographics, traditional attributes towards targets and personality traits. Some researchers have proposed additional external variables, which could be included in the model for predicting the behavior.

Those variables are: past behavior, past experience or involvement. (Bagozzi, Wong, Abe, & Bergami, 2000; Bunce & Birdi, 1998; Shim, 1989) quoted in (Belleau, 2007).

According to (Fishbein and Ajzen, 1975) quoted in (Sheppard, 1988) "a behavioral intention measure will predict the performance of any voluntary act, unless intent changes prior to performance or unless the intention measure does not correspond to the behavioral criterion in terms of action, target, context, time-frame and/or specificity". TRA model predicts consumers' intention and behavior very well. (Armitage and Conner, 2001) quoted in (Belleau et al., 2007); state that behavior that is comparatively straightforward i.e. under volitional control can be predicted adequately by theory of reasoned action. As it is understood that an intention to buy a product is volitional and few constraints are associated with it, so the usage of theory of reasoned action can lead to valid prediction of purchase intention.

However, there is a constraint associated with the TRA model regarding the distinction between a goal intention and a behavioral intention, which has also been acknowledged by Fishbein and Ajzen. The limitation is that they established their model to cope with behaviors, for example, taking weight loss pill, applying for a loan or purchasing a new car; but not with outcomes that result from behaviors, for example, losing 10 pounds, getting a loan or owning a brand new car. Moreover, only those behaviors are dealt by model that is under an individual's volitional control. The conditions of the model can't be fulfilled, whenever the performance of some action needs resources, knowledge, skills or environmental hurdles need to be overcome (Sheppard, 1988).

In this study, Technology-organization-environment framework was used to have a more precise forecast on the challenges of adopting and developing E-banking technology in Ethiopian banking industry.

2.5 RTGS Risks

Since RTGS is one of electronic banking element (Nnaka, 2009), it involves some financial risks that other electronic transfer face as well. The major electronic banking risks according to (FSA, 2020) include: -

2.5.1 Operational risks

Banks faces three main types of operations risk: such as volume forecasts, management information systems and Outsourcing. Accurate volume forecasts have proved difficult - One of

the key challenges encountered by banks is how to predict and manage the volume of customers that they will obtain. Many banks going on-line have significantly misjudged volumes. When a bank has inadequate systems to cope with demand it may suffer reputational and financial damage, and even compromises in security if extra systems that are inadequately configured or tested are brought on-line to deal with the capacity problems. The second type of operations risk concerns management information systems. Again, this is not unique to E-banking. Banks may have difficulties in obtaining adequate management information to monitor their eservice, as it can be difficult to establish/configure new systems to ensure that sufficient, meaningful and clear information is generated. Such information is particularly important in a new field like E-banking. Finally, a significant number of banks offering E-banking services outsource related business functions, e.g. security, either for reasons of cost reduction or, as is often the case in this field, because they do not have the relevant expertise in-house.

Outsourcing a significant function can create material risks by potentially reducing a bank's control over that function Security risk: Security issues are a major source of concern for everyone both inside and outside the banking industry. E-banking increases security risks, potentially exposing hitherto isolated systems to open and risky environments. Security breaches essentially fall into three categories; breaches with serious criminal intent (e.g. fraud, theft of commercially sensitive or financial information), breaches by 'casual hackers' (e.g. defacement of web sites or 'denial of service' - causing web sites to crash), and flaws in systems design and/or set up leading to security breaches (e.g. genuine users seeing / being able to transact on other users' accounts). All of these threats have potentially serious financial, legal and reputational implications.

2.5.2 Reputational risk

This is considerably heightened for banks using the Internet. For example, the Internet allows for the rapid dissemination of information, which means that any incident, either good or bad, is common knowledge within a short space of time. Internet rumors can easily become self-fulfilling prophecies. The speed of the Internet considerably cuts the optimal response times for both banks and regulators to any incident. Banks must ensure their crisis management processes are able to cope with Internet related incidents (whether they be real or hoaxes). Any problems encountered by one firm in this new environment may affect the business of another, as it may affect confidence

in the Internet as a whole. There is therefore a risk that one rogue e-bank could cause significant problems for all banks providing services via the Internet. This is a new type of systemic risk and is causing concern to E-banking providers. Overall, the Internet puts an emphasis on reputational risks.

In addition, legal risks (e.g. without proper legal support, money laundering may be influenced); Strategic risks; credit risks; market risks; and liquidity risks are also E-banking risks. Therefore, identification of relevant risks, and formulation and implementation of proper risk mitigation policies and strategies are important for banks while performing E-banking. Among these security risk that affects the network system is the major one FSA.

2.5.3 Strategic Risk

E-banking is relatively new and as a result there can be lack of understanding among senior management about its potential and implications. People with technological but not banking skills can end up driving the initiatives. E-initiatives can spring up in an incoherent and piecemeal manner in firms. They can be expensive and can fail to recoup their cost. Furthermore, they are often positioned as loss leaders (to capture market share), but may not attract the types of customers that banks want or expect and may have unexpected implications on existing business lines.

2.5.4 Business Risk

Business risk is also significant in E-banking. Given the newness of E-banking, nobody knows much about whether E-banking customers will have different characteristics from the traditional banking customers. They may well have different characteristics. This could render existing score card models inappropriate, thus resulting in either higher rejection rates or inappropriate pricing to cover the risk. Banks may not be able to assess credit quality at a distance as effectively as they do in face to face circumstances. It could be more difficult to assess the nature and quality of collateral offered at a distance, especially if it is located in an area the bank is unfamiliar with (particularly if this is overseas).

2.5.5 Security Risk

Security issues are sources of concerned for everybody more especially as it concerns banking industry. E – banking is prone to security breaches such as fraud, theft of commercially sensitive or financial information, defacement of web sites or denial of service and flaws in system design and/or set up leading to security breaches. All these security breaches have potentially serious financial, legal and reputational implications.

2.6 Empirical Studies Related with RTGS Adoption and Development

A lot of related studies were conducted by different researchers in different countries. Nevertheless, there are limited numbers of studies were conducted in Ethiopia on the adoption and development of the technological innovation particularly on E-banking services. Specifically, (Gardachew, 2010) conducted research on the opportunities and challenges of E-banking in Ethiopia. The aim of his study was focused on analyzing the status of E-banking in Ethiopia and investigates the main challenges and opportunities of implementing E-banking system. The author conducted a survey on the existing operating style of banks and identifies some challenges of using E-banking system, such as, lack of suitable legal and regulatory frame works for E-commerce and E- payments, political instability in neighboring countries, high rates of illiteracy and absence of financial networks that links different banks. According to Gardachew, Opportunities offered by ICT through e-learning programs and Commitment of the governments on development of ICT infrastructures is considered as drivers of using E-commerce and E-payment systems. Ayana, (2012) also conducted research on factors affecting adoption of E-banking System in Ethiopian Banking industry. The study was conducted based on the data gathered from four banks in Ethiopia. The result of the study indicated that, the major barriers Ethiopian banking industry faces in the adoption of Electronic banking are: security risk, lack of trust, lack of legal and regulatory framework, Lack of ICT infrastructure and absence of competition between local and foreign banks. The study also identified perceived ease of use and perceived usefulness as a driver of adopting E-banking system.

Study conducted by (Khalfan et al., 2006) on 'Factors influencing the adoption of internet banking in Oman. Data, used in their study were collected using semi structured interviews and survey questionnaire as well as reviewing some bank documents. The results of their study provide a Pragmatic picture about the adoption of E-Commerce applications in the core financial sector

domain of Oman. One of the main findings is that security and data confidentiality issues have been a major challenge. The banking sector was reluctant to use E-commerce applications as they felt that transactions conducted electronically were open to hackers and viruses, which are beyond their control. Lack of top management support is the other inhibiting factor in the adoption of electronic commerce applications as per their finding.

(Siam, 2006) investigated the role of electronic banking services on the profits of Jordanian banks. He investigated the reasons behind providing electronic banking services through the internet and their impact on banking services in general and banks profitability. The study was done in 20 commercial banks operating in Jordan. The sample period was between 2003 to 2006 and they interviewed 98 managers. Accounting data was used to measure banks performance using regression analysis. He concluded that the effect of electronic banking services on banks profitability is negative in the short run because of costs and the investments the bank carry in order to have the technical and electronic infrastructure in place, training the employees to be skilled and competent but will be positive on the long run.

The study conducted by (Daghfous and Toufaily, 2007) on factors affecting adoption of E-banking technology in Lebanese banks. The study was conducted on the factors that can lead to success the adoption of E-banking and the other factors that can constitute as challises to its adoption, it focus on the organizational, structural and strategic factors. Data, used in their study were collected using semi structured interviews and survey questionnaire that was given to E-banking managers all the banks on the official list of institutions operating on the Lebanese market, with a total of 57 banks, 31 of them operate internationally and 26 are strictly local were used to gather data. The results of the study revealed that the organizational variables (bank size, functional divisions, technical staff, technical infrastructure, perceived risks, decision makers` international experience and mastery of innovation) are variables which exert significant impact on the adoption of E-banking, among the structural characteristics, the result revealed that internal technological environment of the bank is a very important factor in determining the adoption of E-banking, also the result shows that banks which are developing in the international scale are more likely to adopt E-banking innovations. Finally, the result of the study indicated that extent of penetration of E-banking in the growth phase of an emerging market has an important correlation with the improvement of commercial performance.

(Njuguna et al., 2009) conducted a study on internet banking adoption in Nairobi County, Kenya between 2010 and 2011. The purpose of the study was to establish the factors that influence adoption of internet banking among the individuals who have accounts with commercial banks in Nairobi County; Kenya. Only 24.82% of the respondents use Internet banking services. This is despite the high rate of internet access recorded. They concluded that internet banking is still at its nascent stages as demonstrated by the length of usage response. The results also revealed that perceived usefulness, perceived ease of use, self-efficacy, relative advantage, compatibility, and result demonstrability have a significant association with intention to use internet banking, while risk, visibility and trialability are not significant. Other study conducted by (Gikandi and Bloor, 2010) on adoption and effectiveness of electronic banking in Kenya. The results showed that there was a drastic shift in the importance attached to some E-banking drivers between years 2005 and 2009. In the 2005 survey, the number of other retail banks adopting E-banking was considered as a driver of medium importance by 70% of the banks, however, in the 2009 survey it was ranked among the extremely important drivers by a 100% of the banks. Similar observations were made in the case of competitive forces. Internet security was identified as the most important future challenge in E-banking while customer trust, privacy and awareness were recognized as challenges of great importance. The study concluded that cost reduction and customer related factors have emerged as the main drivers of E-banking adoption in Kenya. Mobile banking growth is expected to continue.

It would be good to find out if there has been any change with the increase in competition among commercial banks in Kenya and changes in the regulatory environment. E-banking challenges and opportunities in Greece were researched by (Angelakopoulos and Mihiotis, 2011). The main findings demonstrate that banks expand to E-banking services in order to remain competitive, to keep track with technological developments and to benefit from the lower cost of E-banking transactions. The major problems they face are the low response rate from customers and the implementation of security and data protection mechanisms. The relatively low Internet usage, the non-familiarity with technologically advanced devices and problems regarding security and privacy are the main factors that have a negative influence on the adoption of E-banking services by customers in Greece.

(Rasoulian and Safari, 2011) carried out research concerning reasons as to why there was a lack of E-banking achievement; the result of the first chapter of their study showed the importance of Internet use, frameworks and encouraging policies to impress beneficiaries to use electronic banking. The second part introduced cultural elements as the most important challenge followed on by financial elements (the cost of the Internet and commissions) as the second influencing factor. The significance of technical elements is fading away according to their study due to improvements in the banking system. In addition, their study highlighted other parameters such as management obstacles as also playing an important role in electronic banking in Iran.

(Sumra, et al., 2011) carried out a study on the impact of E-banking on the profitability of Pakistani banks. The study was qualitative in nature assessing the qualitative factors in determining the impact of E-banking. It also discussed the effect of customers' literacy on provision of services from banks' perspective. The study was conducted in 12 Pakistani banks from three cities. The results showed that E-banking has increased the profitability of banks; it has enabled the banks to meet their costs and earn profits even in the short span of time. The illiteracy of customers is not regarded as a major impediment in provision of their products and services. For banks, the main motive to adopt Electronic banking is to increase their clientage and to retain their customers. The profitability of banks has augmented in transitioning to E-banking medium. It would be important to carry out a similar qualitative research in Kenya to determine whether similar results would be obtained.

(Simeon and Bamidele, 2012) "Cashless Banking in Nigeria: Challenges, Benefits and Policy implications", have studied the challenges, benefits and policy implications towards the creations of cashless society in Nigeria and have found that the shift towards a cashless Nigeria seems to be beneficial though it comes with high level of concerns over security and management of cost savings resulting from its implementation. Its objective is to examine the implication of cashless banking with a view to exposing the possible challenges and prospects it poses to the Nigerian economy whilst employing aggregated approach. Vis-à-vis the rising doubts with regard to the effectiveness of various economic policies in achieving developmental goals of Nigeria, the study presented significant recommendations: availability of sufficient and well-functioning infrastructural facilities (notably electricity), harmonization of fiscal and monetary policy, regular assessment of the performance of cashless banking channels (individually and collectively),

consideration of the present state and structure of the economy, redesign of monetary policy framework and greater efforts towards economic growth whilst managing inflation.

The following section, reviews empirical studies related with challenges, benefits and drivers of E-banking technology adoption.

2.6.1 Challenges of RTGS

According to (Harrison, 2012), it is hypothesized that many of the factors affecting the successful adoption of new technologies such as e-commerce and E-banking are generic in nature and that the successful adoption of internet technologies in part depends on how these are used in conjunction with the other technologies and management practices that form a technology cluster. However, the most critical challenges can be ascribed to the very limited information and communication infrastructure available in most developing countries. Reasons vary widely among sectors and countries and are most commonly related to lack of applicability to the business, preferences for established business models, (OECD, 2004). Common challenges include; - enabling factors (availability of ICT skills, qualified personnel, network infrastructure); cost factors (ICT equipment and networks, software and re-organization); security and trust factors (security and reliability of ecommerce systems, uncertainty of payment methods, legal frameworks and intellectual property right); and challenges in areas of management skills, technological capability, productivity and competiveness. Lack of reliable trust and redress systems and cross country legal and regulatory differences was also impeding e-commerce adoption (OECD, 2004). It is however important to note that challenge to e-commerce adoption work differently according to organizational type and culture. Areas of training and people development need to be addressed (Harrison, 2012).

The study that was conducted by (Isaac, 2005) indicated that the challenges for the adoption of E-banking in Africa are security, human face i.e. customers still value personalized and responsive services from their bankers, poor and/or lack of technological infrastructure especially in the rural areas, lack of proper legislation governing e-transactions and preference to paper money, as opposed to "virtual" cash in transactions etc.

(Ziad et al., 2009) also analyzed E-commerce challenges in terms of three categories: economic, socio-political and cognitive. The economic obstacles include several factors that affect the diffusion of e-commerce such as slow internet diffusion, unavailability of credit cards, unavailability of a physical delivery system, and low bandwidth availability.

The socio-political challenges take account of government regulations like privacy and security, lacks of business laws for e-commerce, lacks of legal. Finally, the cognitive hindrances contain a number of factors which lead to a negative cognitive assessment of E-commerce of individuals and organizations like inadequate awareness, knowledge, skills, and confidence; a lack of awareness and understanding of potential opportunities; lack of confidence in service providers and the postal network and computer illiteracy (Ziad et al., 2009)

(Japhet and Usman, 2010) identified the following specific challenges hindering the adoption of e-commerce in developing countries.

➔ Lack of convenient payment means, poor distribution system, imperfect legal system, and lack of large scale telecommunication transmission capability (broadband), Internet security are problems face these countries.

➔ Another most pressing limitations are access to technology (computers, connectivity, and gateway to Internet), limited bandwidth, which reduces the capacity to handle audio and graphic data; poor telecommunications infrastructures and unreliable electricity supply.

➔ The cost of the Internet access makes it inaccessible to most users in developing countries. The cost of accessing the infrastructures also influences the growth of ecommerce. The priority for most developing countries is to put in place the necessary infrastructure and a competitive environment and regulatory framework that support affordable Internet access. The monthly connection cost of the Internet far exceeds the monthly income of a significant portion of the population.

➔ Confidence and trust is also an essential requirement for secure electronic trading. The geographical separation of buyers and sellers, often coupled with a lack of real-time visual or oral interaction, creates a barrier to ecommerce adoption in developing countries. Language is another important hindrance to ecommerce adoption. Most people in developing countries are illiterates and uneducated. Moreover, English is a primary language used in many Western countries where

new technologies originate. It is the predominant language for development of IT and ecommerce and it is the main language used on the Web.

➔ Finally, the study identified various socioeconomic characteristics as barriers hindering ecommerce adoption in developing countries. The most common are unfavorable economic condition, the poor state of educational system, Lack of ICT skills and business skills, unreliable and non-secure payment infrastructures, the inefficient logistics and distribution system and the lack of good transport.

Exploratory study conducted by (Alhaji Ibrahim H., 2009) the following are among the critical challenges for the adoption of E-banking in Nigeria: -

➔Lack of Technological Infrastructure – the implementation of e-payment is being impeded by unavailability of ICT infrastructure. Most rural areas where majority of small and medium scale industries are concentrated have no access to internet facilities

➔ ICT Equipment Costs – where available, the cost of ICT is a critical factor relative to per capital income. This makes the cost of entry higher compared to developed countries.

➔ Regulatory and Legal Issues – inexistence of proper legal and regulatory framework.

➔ Non-readiness of banks and other stake holders (acceptability) – even though some have shown impressive willingness, some banks are still not fully ready to for this new payment regime.

➔ Resistance to changes in technology among customers and staff due to: · Lack of awareness on the benefits of new technologies,

- ✓ Fear of risk among banks
- ✓ Lack of trained personnel in key organizations and
- ✓ Tendency to be content with the existing structures

➔ People are resistant to new payment mechanisms;

➔ Security – where disclosure of private information, counterfeiting and illegal alteration of payment data may be rampant.

➔ Frequent connectivity failure in telephone lines.

➔ Frequent power interruption.

In addition, a research conducted by (Eze and Nwankwo, 2012) stated that the following as major challenges for adoption and development of E-banking technology in Nigeria: -

➔ Legal and Regulatory framework: - The absence of a proper legal and regulatory framework for internet constitutes one of the major challenges of E-banking. The existing banking laws do not address the issue of E-banking as a new banking system.

➔ Consumer Protection: - Another major challenge of the development of E-banking is the issues of adequate protection for consumers of banking products from the various risks to which they are exposed to. The risks include financial loss, malfunctioning of terminals or cards as well as the possibility of unauthorized disclosure of information without the consent of the consumer. The challenges here range from customer details being stolen from the vendors files to the selling up of a fraudulent website by fake customer to deceive other innocent customers.

➔ Loss of Audit Trail: - Another challenge of E-banking is the loss of audit trail as business processes continue to change with internal banking, personal computer and telephone banking. Audit trail basically allows for the tracing of transactions through banking environment facilitates the work of supervisors in ascertaining the reliability or otherwise of the information contained in the master file.

➔ Security of Financial Transactions: - There are numerous threats to the security of internet banking. One of such threats is the fear of insecurity and trust associated with on-line banking which can only be tackled by a good online developer that can put in place the required firewalls whereby only the authentic users can gain access. Security breaches in E-banking are most frequently discussed in terms of the dangers that hackers may intercept messages, misuse the information on modify the content of the message.

➔ Money Laundering and other Financial Crimes: - Another major challenge is that under E-banking the financial system is prone to criminal abuse such as money laundering and other financial crimes. Money laundering and other financial crimes are easily facilitated through E-banking. This has given a lot of work to monetary authorities which have continued to work to see that the activities of the money launderers and fraudsters are brought under control.

➔ Systems and Infrastructure Failure: - Systems and infrastructural failure have also a lot of effect on E-banking. Failure results to loss of data. System failure can be caused by software failure either at the entity or at an organization used for outsourced functions. Infrastructure failures are mainly caused by power failure. The system and infrastructural really given a lot of setback to development E-banking.

➔ The Potential Risks of E-banking: - Electronic delivery and payments systems involve a wide range of potential risks. The use of an electronic channel to deliver products and services introduces unique risks due to the increased speed at which systems operate and the broad access in terms of geography, user group, applications database and peripheral systems. The potential risks bring by the e –banking has a lot of implications for the safety and soundness of the nations banking system.

A research conducted by (Vaithianathan, S., 2010) stated that lack of technology infrastructure, lack of awareness, lack of skilled human resources, and the lack of government initiatives, including various economic and social factors are cited as hurdles that prevent pervasive e-commerce adoption in Indian.

2.6.2 Benefits of RTGS

Banks just like other businesses are tuning to information technology to improve business efficiency, service quality and attract new customers. (Farshad et al., 2013) aver that the most important factors encouraging consumers to use online banking are lower fees followed by reducing paper work and human error. Subsequently electronic channels can lead to lower transaction costs which are very competitive. (Claessens and Kliengbiel, 2000; Farshad et al., 2013) is of the view that disputes can be minimized between the employees as there is a clear flow of processes. Conducting business outside the normal branch working hours has also been a factor that has been considered convenient for bankers, inexpensive access to the bank 7x24 and seven days a week. Increased availability and accessibility of more self-service distribution channels help bank administration in reducing the expensive branch network and associated staff overheads. A reduction in the percentage of customers visiting the banks with an increase in alternative channels of distribution will also minimize the queues in branches (Thornton and White, 2001). According to (Thornton and White, 2001) this ultimately leads to improved customer satisfaction.

(Jayawardhena and Foley, 2000) observe that electronic banking increases competition within the banking system and also from non-bank financial institutions.

Electronic banking also increases the power of the customer to make price comparisons across suppliers quickly and easily and as a consequence this pushes prices and margins downward. (Kerem, 2003) observed that banks are responding to electronic banking differently and that those which see electronic banking as a complement and substitute to the traditional channels achieved better communication and interactivity with the customers. Other benefits that have accrued because of the adoption of electronic banking in developed countries include the ability to attract new customers and widening the customer database, improving bank marketing and communication, and having the ability to retain high profit customers (Farshad, 2013).

According to (Harrison, 2012), companies can gain two fundamental types of benefits from E-banking. These are generally described as: Value creation or value enhancement for one or more of a company's stakeholder's groups, and lower cost of providing goods and services to the market place. Value creation includes; improvement in internal and external communication through effective e-marketing, increment of sales through an ecommerce website integrated with a back office systems and improvement in supplier relations and productivity through collaborative work spaces. Lower costs are: reduction in communication and travel cost using online meeting tools; shared workspaces and; benefit from license free open source alternatives to proprietary software.

Businesses also see tremendous opportunities for cost saving, revenue generation, increased market share, marketing and market access, and improving customer service through direct links that facilitate speedy enquiry and feedback. Similarly, consumers can inter alia, access the world market through the virtual economy on the internet, choose from a wider variety of products, and shop in the comfort of their homes. Globalization and specifically liberalization of communication networks have all facilitated this breakthrough that further presents a massive boost for international trade (Ibid, 2012)

(Harrison, 2012) suggested that the commercial benefits of E-banking lie in five areas; firstly, firms are able to expand their geographical reach. Secondly, important cost benefits lie in improved efficiency in procurement, production and logistics processes. Thirdly, there is enormous scope for gaining through improved customer communications and management. Fourthly, the internet reduces barriers to entry for new market entrants and provides an opportunity for small firms to

reorient their supply chain relationships to forge new strategic partnership. Finally, e-commerce technology facilitates the development of new types of products and new business models for generating revenues in different ways as well as different revenue streams.

(Humphrey et al., 2001) stated that the introduction and use of E-payment instruments holds the promise of broad benefit to both business and consumers in the form of reduced costs, greater convenience and more secure, reliable means of payment and settlement for a potentially vast range of goods and services offered worldwide over the internet or other electronic networks. Electronic Payments as argued by (Cobb, 2005) have a significant number of economic benefits apart from their convenience and safety. These benefits when maximized can go a long way in contributing immensely to economic development of a nation.

In general, E-banking service is important for several stakeholders, since it helps them to derive benefits from it. Many Banks have already implemented or are planning to implement E-banking because of the numerous potential benefits associated with it. Benefits of adoption E-banking for banks and customer are described below.

2.6.3 Benefit of RTGS for Banks

According to (Jayawardhena & Foley, 2000) the primary benefits of E- Banking are as follow: -

Price- In the long run a bank can save on money by not paying for tellers or for managing branches. Plus, it's cheaper to make transactions over the Internet.

Customer Base- the Internet allows banks to reach a whole new market- and a well off one too, because there are no geographic boundaries with the Internet. The Internet also provides a level playing field for small banks who want to add to their customer base.

Efficiency- Banks can become more efficient than they already are by providing Internet access for their customers. The Internet provides the bank with an almost paper less system.

Customer Service and Satisfaction- Banking on the Internet not only allow the customer to have a full range of services available to them but it also allows them some services not offered at any of the branches. The person does not have to go to a branch where that service may or may not be offer. A person can print of information, forms, and applications via the Internet and be able to

search for information efficiently instead of waiting in line and asking a teller. With better and faster options, a bank will surely be able to create better customer relations and satisfaction.

Image- A bank seems more state of the art to a customer if they offer Internet access. A person may not want to use Internet banking but having the service available gives a person the feeling that their bank is on the cutting image.

2.6.4 Benefit of RTGS for Customers

The main benefit from the bank customers' point of view is significant saving of time by the automation of banking services processing and introduction of an easy maintenance tools for managing customer's money. The main advantages of E-banking for corporate customers as per (BankAway, 2001) and (Gurău, 2002) are as follows: -

- ⇨ Reduced costs in accessing and using the banking services.
- ⇨ Increased comfort and timesaving — transactions can be made 7x24, without requiring the physical interaction with the bank.
- ⇨ Quick and continuous access to information: Corporations will have easier access to information as, they can check on multiple accounts at the click of a button.
- ⇨ Better cash management: E-banking facilities speed up cash cycle and increases efficiency of business processes as large variety of cash management instruments are available on internet sites. For example, it is possible to manage company's short term cash via internet banks (investments in over-night, short- and long term deposits, in commercial papers, in bonds and equities, in money market funds). Private customers seek slightly different kind of benefits from E-banking.

The main benefits from E-banking for private customers are as per (BankAway, 2001) are as follows: -

- ⇨ Reduced costs: This is in terms of the cost of availing and using the various banking products and services.
- ⇨ Convenience: All the banking transactions can be performed from the comfort of the home or office or from the place a customer wants to.
- ⇨ Speed: The response of the medium is very fast; therefore, customers can actually wait till the last minute before concluding a fund transfer.

- ⇨ Funds management: Customers can download their history of different accounts and do a "what-if" analysis on their own PC before affecting any transaction on the web. This will lead to better funds management.

Electronic Banking as already stated has greatly serviced both the public and the banking industry. This has resulted in creation of a better enabling environment that supports growth, productivity and prosperity. Besides many tangible benefits in the form of reduction of cost, reduced delivery time, increased efficiency, reduced wastage, banking electronically controlled and thoroughly monitored environment and discourage many illegal and illegitimate practices associated with banking industry like money laundering, frauds and embezzlements. Further E-banking has helped banks in better monitoring of their customer base. This is a useful tool in the hand of the bank to device suitable commercial packages that are in conformity with customer needs. As E-banking provide opportunity to banking sector to enlarge their customer base, a consequence to increase the volume of credit creation which results in better economic condition. Besides, E-banking has also helped in documentation of the economic activity of the masses (Mahdi Salehi, 2004).

2.6.4 Drivers for Adoption of RTGS Technology

An exploratory research conducted by (Mahdi Salehi, 2004) in Iran indicated that the adoption status of E-banking is the transition of pre-development to development phase and the main drivers for adopting E-banking are downsizing, gaining competitive advantage, increasing market share and improving bank's image. In addition to the above factors, the case study that was conducted in china by (Sherah Kurnia, Fei Peng & Yi Ruo Liu, 2005) suggested that the government support is also a strong driver for E-banking adoption. The government support is manifested in two ways. Firstly, the Government is establishing an electronic commerce (EC)-friendly environment in the country. The government in recent years to revamp the national ICT and logistic infrastructures has committed heavy investments. New EC laws and regulations have also been passed and adjusted to provide legal protections for EC activities in general. Secondly, the government also directly offers financial incentives to promote E-banking adoption.

The study that was conducted by (Isaac, 2005) indicated that the drive forces for the adoption of E-banking in Africa are rapidly changing customers' needs and preferences, government support, competitive forces and product differentiation strategies and pressure to reduce transactional and

operation costs. In the study on online banking drivers (Aladwani, 2001) has found, that providing faster, easier and more reliable services to customers were amongst the top drivers of E-banking development.

2.7 RTGS Challenges in Ethiopia

Banking and Finance is an important sector for establishing e-commerce. There are some roles of banking sector in ecommerce such as, online corporate banking, electronic fund transfer, automated teller machines (ATM), debit card, credit card etc. Bank is the only authorized organization which can store and transact money. Technological developments in banking sector make trading activities much easier and cheaper for customers. It provides convenience in terms of the capital, labor, time and all the resources needed to make a transaction (Uppal, 2008). Banking in Ethiopia faces numerous challenges to fully adopt E-banking. Research result studied by (Wondwossen & Tsegai, 2005) forward the following challenges:

- ⇨ Low level of internet penetration and poorly developed telecommunication infrastructure:
- ⇨ Lack of infrastructure for telecommunications, Internet and online payments impede smooth development and improvements in e-commerce in Ethiopia.
- ⇨ Lack of suitable legal and regulatory framework for e-commerce and e-payment: Ethiopian current laws do not accommodate electronic contracts and signatures. Ethiopia has not yet enacted legislation that deals with ecommerce concerns.
- ⇨ Political instabilities in neighboring countries: Political and economic instabilities in Somalia, Southern Sudan, and Eritrea are threatening traits that do not provide a very conducive environment for E-banking in Ethiopia.
- ⇨ High rates of illiteracy: Low literacy rate is a serious impediment for the adoption of E-banking in Ethiopia as it hinders the accessibility of banking services. For citizens to fully enjoy the benefits of E-banking, they should not only know how to read and write but also possess basic ICT literacy.
- ⇨ High cost of Internet: The cost of Internet access relative to per capita income is a critical factor. Compared to the developed countries, there are higher costs of entry into the e-commerce market in Ethiopia. These include high start-up investment costs, high costs of computers and telecommunication and licensing requirements.

- Absence of financial networks that links different banks (Banks are not yet automated): Most of the banking-transactions currently taking place use credit and debit cards supplied by Visa and MasterCard. For conducting E-banking, the use of credit or debit cards is mandatory thus requiring the need for specialized systems which are not currently available.
- Frequent power interruption: Lack of reliable power supply is a key challenge for smoothly running E-banking in Ethiopia.

2.8 Knowledge Gap

The previous studies focused on factors influencing adoption of other E-banking technologies other than RTGS i.e internet banking, ATM, mobile banking and point of sale (POS). Much documentation on those E-banking services has been carried out elsewhere. However, in developing countries like Ethiopian, there is little evidence concerning RTGS. As far RTGS is concerned, a lot of researches on modern service delivery channels have been done in different countries in the world. As per the knowledge of the researcher only a very limited number of researches have been done on RTGS in Ethiopian Banking industry like that of (Equbamariam, 2018) and (Gardachew, 2010). Therefore, since RTGS is one of modernized element in E-banking. (Nnaka, 2009), more studies are still required to assess challenges of RTGS in the country to identify areas in which the country lags behind their RTGS adoption and diffusion. So this study focused on different factors affecting adoption and development of RTGS technology in Ethiopian Banking industry and aim at to contribute literature for other related research on the topic of real time gross settlement (RTGS).

Chapter Three

3. Research Design and Methodology

This chapter will present the methodological framework applied to solve the research problem and to answer the research questions. The chapter starts with the chosen research design, sample and sampling method. Afterwards, source of data, method of collection and analysis method will be presented

3.1 Research Design

Research design should provide the overall structure and orientation of an investigation as well as a framework within which data can be collected and analyzed. In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Bryman & Bell, 2007).

According to (Robson, 2002), the three purposes of conducting research are generally the following: explorative, descriptive and explanative. Explorative research is characterized as the seeking of new insights, the looking around, and the asking of questions or the bringing of some phenomenon into new light. Explanative research aims at gaining an explanation of a specific situation or problem, generally in the form of causal relationships. Finally, Descriptive research is a type of research that is mainly concerned with describing the nature or condition and the degree in detail of the present situation. (Creswell, 2003) stated that the descriptive method of research is used to gather information about the present or existing condition.

This study was focused on describing the current situation of the problem and answer the research questions which are in the form of ''what'', and to highlight the most important factors that can affect the adoption and development of RTGS in Ethiopia. Moreover, this research aims to explain the phenomenon and assess challenges RTGS in current practice. Therefore, Descriptive research is being used to achieve the research objectives.

3.2 Research Approach

In order to achieve the objectives of the research both quantitative and qualitative approach will adopt by the researcher. The purpose of using such a mixed methods approach was to be used to gather data that should not be obtained by adopting a single method. The quantitative approach was utilizing to examine the effect of tax holiday in stimulating manufacturing sector in Bole Lemi I industrial park particular, whereas the qualitative approach was employ to assess the attitudes, Opinions and behaviors from the primary data.

3.3 Target population and Sampling

In the research methods, population is the entire aggregation of items from which samples can be drawn. (Yahiya, 2011). The population of the present study consists of both private and public commercial banks that have operated. Hence, according to National Bank of Ethiopia Quarterly (Bulletin, 2019), the total number of Commercial Banks which operating is 18, of which 16 commercial banks owned privately.

Purposive or Judgmental sampling is a strategy that is used in particular settings persons or events are selected deliberately in order to provide important information that cannot be obtained from other choices. It is where the researcher includes cases or participants in the sample because they believe that they warrant inclusion (Hamed T., 2016), So, in order to undertake this study, the researcher purposely sampled six private commercial banks, which are adopted RTGS technological. Those banks are Awash International Bank S.C., Dashen Bank S.C., United Bank S.C., Zemen Bank S.C., Wegagne Bank S.C. and Nib International Bank S.C.

The procedure used for drawing the sample from the available lists was based on their familiarity with RTGS technology i.e. long years' services in providing RTGS product to public. The researcher chooses to take six private commercial banks as a sample, because it is often impossible or too much expensive to collect data from all the potential units.

Thus, this research paper used purposive sampling method to draw the sample from the population. Samples are chosen to represent the relevant attributes of the population. The researcher also notes the caution by (Graziano and Raulin, 1997) where the samples are not perfect representative of the population from which they are drawn, therefore the researcher unlikely to be able to generalize

the conclusions to the entire population. The area chosen for this study is Addis Ababa because head office of all commercial banks that represents the whole branches in the country and the central bank of the country are located there and also RTGS experts of each commercial bank are located at head offices which found in the capital city of the country, Addis Ababa.

3.4 Sources of Data

The study was conducted by collecting data from both primary and secondary sources. Primary data was collected from the staffs of the selected commercial banks based on a structurally designed questionnaire which included both closed ended and open-ended questions. Because closed ended question together with open ended type of questions gives the respondents an opportunity for adequate expression of their view on the questions (Ranjit, 2011).

In addition, semi-structured interview with the higher official of each commercial banks electronic transfer managers were conducted. In order to get sufficient and reliable data that represents the whole branch of the selected commercial banks both primary and secondary data was collected from each bank at the head office level. Secondary data: different published documents, records and reports of the industry, Regulatory organ reports, from web site, books, annual reports and magazines, articles and journals were also analyzed.

3.5 Method of Data Collection

In order to collect sufficient data so as to answer the research questions, researcher designed two surveys; the first was a questionnaire to get quantified results. The second survey was interviews aimed to collect data from electronic inter-bank transfer (RTGS) managers. In addition to questionnaire and interview secondary data source has been also used.

3.5.1 Questionnaires

According to (Yin, 2003), structured questioners are important method for collecting primary data and that it further allows the researcher to be well focused on the specific research topic. The questionnaire was used because the researcher considered it to be more convenient respondents could answer at their convenience (See Appendix 1). The questionnaire was developed by the researcher based on the research questions and the objective settled. The researcher used open and closed-ended type of questionnaires, which gives the respondents an opportunity for adequate expression of their view on the questions. The questionnaire began with an introductory statement, which specified the purpose of the research as purely academic. Respondents were encouraged being objective in their responses since they were assured of confidentiality.

To determine the probable usefulness of the questionnaire and whether further revision is needed prior to conducting the survey, the questionnaire was pilot tested. The researcher circulated the questionnaire to four postgraduate students and six professional staffs of each sampled private commercial banks directly engaged in RTGS technology. The subjects were asked if they had any problems understanding the questionnaire or have specific comments regarding the questionnaire. The format for responding was through both open-ended and close-ended questions. The subjects were encouraged to be very free with their responses, make suggestions for improvement and outline any difficulties they found. After each questionnaire was accomplished, every question was asked what he/she meant in checking various answers. Comments were solicited on the intelligibility of the questions and what the changes should be done in order to make the questions simpler.

These respondents also gave their comments on understanding the instructions about the scaling and the time taken to answer the questions. The test found no grave problems and minor modifications were made to the survey questions based on the response obtained. In addition, the pilot study was conducted to ensure the validity, sequence and relevance of the questionnaire to this study.

Despite in the above, six purposely sampled private commercial banks were included in the survey. The target respondents were professional experts who are in charge of the RTGS technology makers and checkers in sampled six private commercial banks. As per the primary data (through phone interviews made with RTGS mangers of each sampled banks) the total number of professional expert directly engaged in RTGS technology in six purposely sampled banks are 201. A questionnaire is floated to 140 professional staffs which selected by simple random sampling calculation of (yamane's, 1966) (for more see Appendix 1) of six private commercial banks selected from Head Offices that directly involved in the delivery of the RTGS Services. The respondents are considered as they are deemed to be knowledgeable in due course of implementing and running RTGS system in their line of work and could provide important perspectives on its adoption as they are involved in implementation of the project. The survey is to be used through distributing self-administered questionnaires. A Stratified sampling technique is employed to select respondent from each of the six private commercial banks. (for more see appendix 1).

Questions present in the form of affirmative statements, relating to the concepts on RTGS and to identify their intention on the challenge and opportunities for adoption and development of RTGS technology, in such a way to enable measurement of the respondent's opinions. The respondents were asked to indicate their level of agreement on a five point Likert scale with the following ratings. Strongly agree (SA; or 5), agree (A; or 4), neutral (N; or 3), disagree (DA; or 2), and strongly disagree (SD; or 1). The numbers were indicated in the questionnaires to provide a feel of ordinal scale measurement and to generate data suitable for quantitative analysis. The questionnaire was a close ended questionnaire to elicit guided responses and for easy analysis and to obtain additional information, the respondents were requested to provide open-ended responses if they have opinions which they feel the researcher would find useful.

3.5.2 Interviews

In addition to questionnaires, semi-structured phone interviews were conducted with managers that concern RTGS of each sampled commercial banks to have sufficient information regarding the research problem and with the relevant bodies of the National Bank of Ethiopia (Banking Supervision directorate). (See Appendix 2). The major purpose of this interview was to corroborate certain facts that the investigator already thinks have been established. (Yin, 2005). Therefore, Thus, semi-structured interviews were conducted so as to substantiated and improve the results of questionnaires.

3.5.3 Secondary data Sources

The secondary sources of data constituted data gathered from records and reports of the industry, of the respective commercial banks, literature on books and journals, and published theses. The most important use of this secondary data source will be to corroborate and augment evidence from other sources. (Yin, 2005). Thus, the document examination helps to substantiate the patterns that evolved from the data collected via questionnaires and interview, so that the validity of the findings could be enhanced through secondary sources.

3.6 Method of Data Analysis

In order to meet the stated research objectives, the collected data was analyzed based on the nature of the objective. Accordingly, the data collected via questionnaires was analyzed with descriptive statistics using statistical package for social scientists (SPSS) V. 20.0. Furthermore, (Creswell, 2003) suggested that qualitative research is fundamentally interpretative i.e. the researcher makes an interpretation of the data. Thus, the data that was collected from the interview and reviews of documents were interpreted qualitatively. To sum, the analysis of quantitative data and interpretation of qualitative data combines to seek convergence among the results. (Creswell, 2003).

The study is a descriptive type of research and used both quantitative and qualitative research method to analyze the gathered data. Data is analyzed using different Qualitative statistical procedures and methods. The statically tools that is used to analyze the data includes simple descriptive statistics such as mean, median, mode and percentage that help to make qualitative interpretation of the analysis.

3.7 Reliability and Validity

Reliability refers to the degree to which one can expect relatively constant deviation scores of individuals across testing situations on the same, or parallel testing instruments, this can be the split-half method, alternate-form method, or Cronbach's alpha method. The most common method of assessing reliability estimates is through the use of coefficient alpha, though there are different measures of coefficient alpha, the most widely used measure is Cronbach's coefficient alpha that measures inter-item reliability or the degree of internal consistency/homogeneity between variables measuring one construct/concept. In the social sciences, acceptable reliability estimates ranges from .70 to.80. Accordingly, the Cronbach's alpha of the variable used in the study was .70. This shows that there is an adequate reliability for group comparisons. Validity on the other hand refers to the extent to which a test measures what it claims to measure. A measure is valid if measures what it is supposed to measure. Accordingly, in this study was the inferences made from scores were appropriate, meaningful, and useful.

3.8 Ethical Considerations

Efforts were made to make the research process professional and ethical. To this end, the researcher tried to clearly inform to the respondents about the purpose of the study i.e. purely for academic. In addition to this, they were informed that their participation in the study was based on their consents. The researcher also did not personalize any of the response of the respondents during data presentations, analysis, and interpretation. Furthermore, all the materials that were used for this research were duly acknowledged. In addition to this, the researcher told the respondents the existence of anonymity and confidentiality.

Chapter Four

4. Results and discussion

This chapter deals with the presentation, interpretation and analysis of data gathered from both primary and secondary sources. The chapter has seven sections. Section.4.1 presents introduction of this chapter, section 4.2 general information of selected private banks, section 4.3 presents the result and discussion regarding the challenges of RTGS in Ethiopia banking industry. Results and discussions regarding the benefits realized and driving factors that initiate for adoption RTGS in Ethiopia are presented in section 4.4 and 4.5, respectively.

4.1 Introduction

Data collected through different techniques were analyzed in this chapter. In the analysis, a total of one hundred forty (140) questionnaires were distributed to professional staff or RTGS expert of six purposely sampled private commercial banks. Out of the one hundred forty (140) questionnaires distributed, one hundred twenty-eight (128) were successfully completed, returned and used for the study. The response rate was approximately 91 % of the total questionnaires distributed. The researcher was also conducted phone interviews with each concerned Department Mangers (IT and RTGS or cheaquepoint Managers) of sampled banks and Banking Supervision Department Manager at NBE. Accordingly, the presentation, analysis and interpretation of the interviews and questionnaires were done simultaneously whereby the findings obtained from the interviews were presented in parallel by substantiating against the results obtained from the questionnaires. In order to analyze the research results, SPSS V. 20.0 tool software was used. Descriptive measures of each questions response and phone interview conducted with concerned managers of selected banks results are presented in the following sections.

4.2 General Information of the Banks

This section shows the demographic details of financial institutions based on the respondents' response to the question asked to indicate the name of the institution, establishment date, commencement date of offering RTGS services, type channels or tools use in providing RTGS services and number of employees and professional staff/ expert involve in providing RTGS services available in each organization. The results are illustrated in the subsequent tables below.

Banks' profile was asked with the intention of associating the overall profile of each bank with the subject matter of the study under consideration.

Name of the Bank	No. of Questionnaire		Established Date	Commencement Date of Offering RTGS Services	RTGS/Cheaque point providers Services Provided	Total Number of Employee	Number of Professional Staff/Expert Involve in Providing RTGS Services
	Distributed	Returned					
AIB	20	20	1994	2011	Cheaque clearance, Inter-bank transfer, And clearance of international CKs	9046	30
DB	40	34	1995	2012		9733	60
WD	15	15	1997	2012		4524	21
UB	20	18	1998	2012		6123	27
NIB	20	16	1999	2011		4972	28
ZB	25	25	2008	2011		794	35
Total	140	128					201

Source: Field survey report 2020, Interview and the respective banks web site.

As shown in the above table six private commercial banks were involved in the study and 140 questionnaires were floated to experts or professional staffs of sampled private banks who are directly engaged in RTGS technology and all the banks have already commenced RTGS services. Out of one hundred forty (140) questionnaires distributed, one hundred twenty-eight (128) were successfully completed, returned and used for the study. The response rate was approximately 91.4% of the total questionnaires distributed.

As revealed in the above table almost all sampled banks have an age of more than seven years. And Zemen bank is a former in introducing RTGS from the sampled private commercial banks and it is also the first bank that introduced RTGS to NBE since Zemen bank's strategy was to operate in one branch (based Phone interview made on Zemen's RTGS manger). Besides, an interview script received from other banks like Wegagen Bank, Awash International Bank, NIB International Bank, United Bank and Dashen Bank were started RTGS services later to Zemen bank in 2011. Hence, more than ten years elapsed since RTGS technology introduced in Ethiopia banking industry and it also show that the sampled private commercial banks have an experience of providing RTGS services more than ten years.

In addition, four banks named Dashen Bank, Zemen Bank, Awash international Bank and NIB International Bank are providing RTGS services to their customer through other E-banking channels or tools such as Point of Sale (POS) Terminals, debit card, Mobile Banking and Internet Banking. Nevertheless, an interviews scripts received from Cheaquepoint Manager confirm that they are on the way to adopt others E-banking channels in order to provide efficient banking services to their customers.

In general, the Ethiopia banks offered different type of banking products or services to their customers except credit, international and prepaid cards and telephone Banking, this can be show that almost all type of banking tools or channels are adopted in Ethiopia banking industry. The above table also shows that respondents' banks have total employees ranging from 794 up to 11,458. This can show to what extent banks are investing on human resources which has its own repercussion on branch expansion strategy of banks. Thus, New banking technology like RTGS has just evolved as a way out as one strategic approach to reduce the investment cost in human resources associated with branch expansion. Out of the total employees professional staffs technology experts who are directly involved in adopting and running of RTGS services ranging from 20 to 85. This implies that on average 1% of the institutions' employees are involved in providing RTGS services. The following section discusses the challenges, prospect, driving forces and opportunities of adopting and extending of RTGS technology in Ethiopia banking industry.

4.1 Challenges of Adoption and Development RTGS

As cited in chapter two, there are so money challenges that negatively affect adoption and growth of the RTGS technology. The factors affecting the successful adoption and growth of new technologies, such as RTGS are common in nature. Such as cost factors, security and trust factors and lack of adequate ICT infrastructure (particularly in developing countries like Ethiopia). However, reasons vary widely among banks and countries and also important to note that challenges to RTGS technology adoption and development work differently according to organizational type and culture.

A total of 21 questions on challenges of adopting and extending of RTGS technology obtained from different literatures were asked to indicate the extent to which each respondent agrees to corresponding closed ended statements rated on a five-point Likert type scales ranging from '1'

"Strongly Disagree" to '5' "Strongly Agree". Statistical results are presented under each section of the factors considered using the table including the number of frequencies, the Mean, Mode and Standard Deviation of the data points. The "Valid" column shows the number of respondents who provided answer for each corresponding variables. On the other hand, the "Missing" column depicted the variables which were not answered by respondents. The mean tried to tell the average where the data points fall for each specific variable, Mode indicated most frequently answered points for each specific variable while the standard deviation column showed the variability of the data points for each variable under consideration. Accordingly, the researcher tried to interpret the Mean and the Mode of the data points. The researcher tried to triangulate and complement the result obtained from the interview and open ended questions with the results obtained from the Likert type statements pertaining to similar variables, when found appropriate. For analysis purpose challenges are categorized in to organizational, environmental and technological factors according to (Tornatzky and Fleisher, 1990).

4.1.1 Organizational Factors

Most cited organizational factors in the different literature are; IT users' community; organizational structure; firm's process; firm size; technological capabilities of the organization's members; the technological and financial resources available; process of selecting and implementing the IT; management backing and support for the project (Harrison, 2012). In this study costs related to implementation and running of RTGS technology, resistance to changes in technology, customer awareness, technical and managerial skills required to implement RTGS technology are considered as organizational factors and the survey result is shown on table 4.2.

Table 4.2 Organization Factors Affecting Adoption and Growth of RTGS transfer Technology.

Challenges	N		Mean	Mode	Std. Deviation
	Valid	Missed			
High cost of implementation of RTGS	**128**	**-**	**3.89**	**4**	**0.84**
Lack of customer awareness with RTGS	**128**	**-**	**3.84**	**4**	**0.84**
Lack of technical and managerial skills in implementation and development of RTGS technology;	**128**	**-**	**3.68**	**4**	**0.94**
Resistance to changes in technology among by Board, top Management and staff;	**128**	**-**	**3.63**	**4**	**0.89**

Source: Field survey report 2020.

Tables 4.5 shows that high cost of implementing of RTGS technology such as cost of ICT equipment and network, software and re-organization is the major organizational challenge for implementation and growth of RTGS technology in Ethiopia, in which the mean score and mode were found 3.89 and 4.00 respectively. This is in line with finding (OECD, 2004) where high cost of ICT equipment and network, software and reorganization is a factor that hinders adoption of new RTGS transfer technology i.e RTGS. The respondent also agreed that lack of social awareness regarding RTGS provided by banks is considered as a factor that negatively affecting the successful adoption and growth of RTGS technology as the average result in the Likert scale is found 3.84. Similarly, an interview script received from Managers of sampled banks indicates that communities are not aware of the benefits of RTGS technology to the individual as well as to the society as whole. As a result, they are not provoked enough to use RTGS services. The finding is in line with (Vaithianathan, S., 2010) and (Angelakopoulos and Mihiotis, 2011) in which all indicted that, the non- familiarity with banking technology products and services by customers is the main factor that has a negative influence on the adoption and growth of RTGS transfer technology.

The result further revealed that most respondents (16% strongly agree and 51% agree, please refer Appendix C) are agreed that lack of technical and managerial skills in implementation and development of RTGS technology is considered as factor that has a negative influence on the adoption and growth of RTGS technology in Ethiopia with a mean score of 3.68. Besides, an

interview conducted with Zemen Bank's project manager confirmed new technology like RTGS requires high level of understanding and knowledge on banking experience and ICT. On other hand limited knowledge of about RTGS and how they operate by the banks worker on the other hand create a great obstacle for implementation and growth of RTGS technology. The finding is in line with (Vaithianathan, S., 2010) where lack of skilled human in RTGS context is considered as hurdles that prevent pervasive e-commerce adoption in developing countries. The respondent also agreed that resistance to changes in technology by Board, Top Management and staff is considered as challenge for the adoption and growth of RTGS technology as the average result in the Likert scale is found 3.63. In general, the result revealed that high cost of implementation of RTGS technology, customer's unfamiliarity with the RTGS and their benefits, lack of technical and managerial skills in implementation and development of RTGS technology and resistance to changes in technology by are considered as organizational factors that hinders Ethiopia banks to adopt and develop RTGS transfer technology.

4.1.2 Environmental Factors

According to (Tornatzky and Fleischer, 1990) another factors influencing technology innovation is environmental factors. The issues raised in this study in relation with environmental factors are infrastructure, role of government, regulation and law, computer literacy and other are considered as organizational factors and the survey result is shown on table 4.3 as follows: -

Table 4.3 Environmental Factors Affecting Adoption and Growth of RTGS transfer Technology.

Challenges	N		Mean	Mode	Std. Deviation
	Valid	Missed			
Limitation in network infrastructure and internet related support services;	128	-	4.27	5	0.815
Customer low levels of computer literacy	128	-	4.09	4	0.834
Limitation in ICT infrastructure	126	2	4.06	4	0.823
Lack of sufficient government support affect customers' willingness	128	-	4.03	4	0.862
Cross-country legal and regulatory differences;	127	1	4.01	4	0.834
Lack of legal framework for Banking;	128	-	3.98	4	1.001

Lack of law mandating the bank to adopt RTGS technology.	128	-	3.80	4	0.97
Lack of adequate coordination, interaction and cooperation between banks and other decision making centers in RTGS context;	128	-	3.70	4	1.082
Absence of financial networks that links different banks	127	1	3.70	4	0.994
Frequent power disruption;	128	-	3.63	4	1.112
Tight foreign currency regulation;	128	-	3.58	4	1.068
Lack of Uniform Platform by Banks i.e. lack of law mandating the banks to use common software platform;	128	-	3.55	4	0.933
Relative high cost of internet;	128	-	3.08	4	1.007

Source: Field survey report 2020.

The above table 4.3 highlighted that limitation in network infrastructure and internet related support services is the basic external challenge for adoption and growth of RTGS technology in Ethiopia, were the median and mode value are 4.27 and 5.00, respectively as per the response of the sampled participants. Likewise, an interview conducted with all managers of sample commercial banks indicates that limitation in network infrastructure and internet related support services is a major obstacle to effectively deliver of RTGS services to their customers. This result is consistent with the findings reported earlier by (OECD, 2004) and (Wondwossen and Tsegai, 2005). The respondent also agreed that a low level of customer computer literacy in the country is considered as basic challenge for implementation and growth of RTGS in Ethiopia in which the mean score was found 4.09. For citizens to fully enjoy the benefits of RTGS, they should not only know how to read and write but also possess basic ICT literacy. Let alone the adaptability to new technology, in a country like Ethiopia where the adult literacy rate (only read and write in Amharic) is only 39.0% (unicef, 2018) and the rate of technology adoption is low, this factor is a challenge for financial inclusion in Ethiopia.

The top third challenge stated by respondents was low level ICT infrastructure development in the country having a mean score of 4.06 since the RTGS requires a generally good infrastructure in terms of communication and information technology. Unless there is a transformation in infrastructural development in Ethiopia, RTGS technology would not serve its purpose as a successful propagator for financial inclusion.

The average responses of the participants agreed that lack of sufficient government support will affect customers' willingness to use RTGS technological innovation (mean=4.03). And also cross-country legal and regulatory differences (Mean=4.01) is external challenge for implementation and growth of RTGS technology in Ethiopia. This result is consistent with the findings reported earlier by (OECD, 2004) where cross country legal and regulatory differences is one factor that impede e-commerce adoption.

As per the response of the sampled participants, lack of legal framework for RTGS technology is considered as a challenge that will have a negative impact on the implementation and growth of RTGS technology in Ethiopia with the Mean value of 3.98. Besides, interviews conducted with each bank manager of sampled banks and Banking Supervision Directorate Manager at NBE also confirmed that, Ethiopia does not have special rule on the use of RTGS technology or it is not yet included in the banking regulation. Therefore, lack of legal frame work for RTGS technology is one challenge for Ethiopian banking industry. This result is consistent with the findings reported earlier by (Ziad et al., 2009) and (Equbamariam K. 2018) studied on limits of e-banking regulation in Ethiopia and found a limit that Ethiopia does not have a comprehensive primary legislation that regulates the E-banking business.

The result further revealed that most respondents agreed lack of law mandating the bank to adopt RTGS transfer technology innovation (Mean = 3.80), absence of financial networks that links different banks (Mean = 3.70), lack of adequate coordination, interaction and cooperation between banks and other decision making centers in RTGS context (Mean = 3.70), frequent power disruption(Mean =3.63) and lack of law mandating the banks to use common software platform (Mean = 3.55) are another external factors that hampered adoption and growth of RTGS transfer technology in Ethiopia banking industry. Regarding with lack of adequate coordination, interaction and cooperation among banks, phone interview conducted with each banking managers of sample banks confirmed that there is no adequate coordination, interaction and cooperation between banks and other decision making centers in RTGS context. Nevertheless, Zemen Bank Manger confirmed that currently banks have reached an agreement to share common checks paper and banker cheaqe paper, that will able them to use RTGS network.

Concerning with foreign currency regulation as challenges the average responses of the participants agreed that current foreign currency regulation is another challenges in extending of RTGS transfer services in Ethiopia banking industry in which the mean value found 3.58. Similarly, an interview conducted with each concerned Department managers of sampled private commercial banks confirm that due to shortage of foreign currency in the country and the respective NBE directive, the banks does not allow to issue international RTGS transfer though NBE. To this effect, Ethiopians have supposed to carry cash while traveling to other part of the world to execute business transaction. This shows that current foreign currency regulation in the county is another external challenge that affects development of RTGS transfer services. Finally, with regard to ideas that high internet cost considered as a challenge on average the respondents were found indifferent as the mean resulted in 3.08.

4.1.3 Technological Factors

Even though there are many benefits associated with adoption of new technology, there are many hindrance technological factors that affect effective implementation and extending of the technology. The issues raised herein under the technological factors were relative disadvantages that hinder banking industries from adoption and development of RTGS transfer technology such as customer fear of risk, security risk, lack of trust with the technology, loss of the audit trail and all of the respondents participated in this study were asked that such factors are consider as challenges that the banks faced while adopting RTGS transfer technology and the survey result is shown on table 4.4 as follows:-

Table 4.4 Technology Factors Affecting Adoption and Growth of RTGS transfer Technology

Challenges	N		Mean	Mode	Std. Deviation
	Valid	Missed			
Users do not trust the RTGS technology provided by banks;	**128**	**-**	**3.96**	**4**	**1.04**
Customer fear of risk to use RTGS transfer technology;	**128**	**-**	**3.91**	**4**	**0.93**
Lack of confidence with the security aspects;	**128**	**-**	**3.86**	**4**	**0.89**
Loss of Audit Trail.			**3.17**	**3**	**0.99**
Money laundering and other financial crimes are easily facilitated through RTGS	**128**	**-**	**3.10**	**3**	**0.95**

Source: Field survey report 2020.

Responses captured in the above table 4.4 shows that, the respondents asked whether customers do not trust the RTGS transfer service provided by banks and the descriptive statistics result gives mean value of 3.96, that means the largest number of respondent (38% strongly agree and 63% agree) were agreed with the idea that lack of customers trust with RTGS transfer technology is one technological factor that have a negative impact for adoption and growth of RTGS transfer technology. This result is in line with the finding of (Ziad et al., 2009) where lack of confidence in service providers is cognitive hindrance in adoption of ecommerce.

According to (Delali, 2010) consumer's confidence, trust in the traditional payments system has made customers less likely to adopt new technologies and new technologies will not dominate the market until customers are confident that their privacy will be protected and adequate assurance of security is guaranteed and also new technologies also requires the test of time in order to earn the confidence of the people, even if it is easier to use and cheaper than older methods.

The result further revealed that the largest number of respondents (37% strongly agree and 56% agree, please refer Appendix C) were agreed with the idea that customer fear of risk to use RTGS transfer technology is considered as challenge for the adoption and growth of RTGS transfer technology in Ethiopia banking industry, were mean and mode value found 3.91 and 4.00, respectively. Likewise, lack of confidence with the security issue is considered as another challenge for the adoption and development of RTGS transfer technology, were mean score and mode value found 3.86 and 4.00, respectively. This result is consistent with the findings of (Okoye, 2013; Ziad et al., 2009; Khalfan et al., 2006) were security risk as hindrance factor for the adoption of RTGS. Thus, customer fear of risk and lack of confidence with the security aspect are other technological factors that hamper adoption and growth of RTGS transfer technology in the country.

Furthermore, the average respondents are indifferent with the idea that RTGS transfer system is the loss of audit trail as business processes continue to change with internal banking, personal computer and telephone banking and RTGS transfer system is prone to illegal abuse such as money laundering and other financial crimes considered as challenges in adoption and development of RTGS transfer technology in Ethiopia banking industry as the Mean value is 3.10 and 3.17, respectively.

4.2 Benefits Realized from Adoption and Development of RTGS

Perceived benefits are the gains or improvements derived from existing traditional ways of operating business transactions using RTGS transfer technology applications. The following section summarizes respondents' views of expectations and perceived benefits for RTGS deployment. Benefits expected to be gained from RTGS as an option is a big deciding factor for a Bank's decision to adoption and growth RTGS transfer technology.

Some of these benefits include facilitate development of new products and new business, improvement productivity, cost saving, increased market share, speed and efficiency of doing business, improvement in customer service and others. A total of 15 questions on "Benefits" of adoption and development of RTGS were asked to indicate the extent to which each respondent agrees to corresponding closed ended statements rated on a five-point Likert type scales ranging from '1' "Strongly Disagree" to '5' "Strongly Agree". Statistical results on the variables under the benefits of RTGS including the number of frequencies, the Mean and Standard Deviation of the data points. The "Valid" column shows the number of respondents who provided answer for each corresponding variables. On the other hand, the "Missing" column depicted the variables which were not answered by respondents. The mean and mode tried to tell the averages where the data points fall for each specific variable while the standard deviation column showed the variability of the data points for each variable under consideration.

Accordingly, the researcher tried to interpret the mean of the data points. The researcher tried to triangulate and complement the result obtained from the interview, open ended questions with the results obtained from the Likert type statements pertaining to similar variables, when found appropriate. The following section summarizes respondents' views of expectations and perceived benefits for RTGS transfer adoption and development. For analysis purpose perceived benefits are classified in to operational efficiency and service benefits. (Futcher, 2003).

4.2.1 Operational Benefits

Despite different challenges faced by adopting and extending of RTGS transfer technology in Ethiopia banking industry, there are enormous benefits expected from adoption and growth of RTGS transfer technology which includes operational and services benefits. Operation benefits covered in the survey are presented here below in the table 4.5.

Table 4.5 Operational Benefits that the Ethiopian Banks Gained from Adoption and Growth of RTGS transfer Technology

Challenges	N		Mean	Mode	Std. Deviation
	Valid	Missed			
Enhance productivity in the banking industry;	**127**	**1**	**4.59**	**5**	**0.677**
Reduced paper work;	**128**	**-**	**4.51**	**5**	**0.683**
Low transaction cost.	**128**	**-**	**4.19**	**5**	**0.878**
Increase reliability and reducing errors;	**128**	**-**	**3.73**	**4**	**0.933**

Source: Field survey report 2020 (see questionnaire No.1)

The potential operational efficiency benefits of RTGS transfer technology as perceived by the banks identified in this study as captured in the above table 4.8, the respondents strongly agreed that adoption and development of RTGS transfer technology in Ethiopia banking industry will increases productivity of the Bank, reduces paper work and transaction cost.

This is evidenced by the data collected from the respondents with mean score of 4.53, 4.51 and 4.49 respectively. Similarly, interviews conducted with each sampled banks mangers supported that adoption and development of RTGS transfer technology reduce the banks cost in two fundamental ways: it minimizes the cost of processing transactions i.e. no need to have too much clerks and cashiers and expenditures on paper slips, forms and other bank stationery have also gone down and reduces the number of branches required to service an equivalent number of customers, this lead the bank profit margin to boost.

Lastly, the other operational benefit of RTGS transfer technology identified in this study is increase reliability and reducing errors. This agreement is also based on the responses of the respondents with mean score of 4.2l.

4.2.2 Services Benefits

In addition to operational benefits, there are also services benefits that the banking industry can attain from adoption and development of RTGS transfer technology. Such services benefits covered in the survey are presented here below in the table 4.6.

Table 4.6 Services Benefits that the Ethiopian Banks Gained from Adoption and Growth of RTGS transfer Technology

Challenges	N		Mean	Mode	Std. Deviation	Rank
	Valid	Missed				
Enhance accessibility of the bank's services (in terms of place);	128	-	4.63	5	0.39	1
Facilitates development of new products and new business in the banking industry;	128	-	4.54	5	0.64	2
Improve customer service;	128		4.50	5	0.62	3
Improving transaction speeds;	128	-	4.49	5	0.64	4
RTGS transfer is convenient, in terms of 7x24 services i.e. accessibility; i.e. No time limit to access bank account and information(in terms of time)	128	-	4.47	5	0.79	5
Facilitates marketing & market access;	127	1	4.46	5	0.63	6
Create better relationship among banks and clients;	127	1	4.34	5	0.71	7
Overcome geographical limitations;	128	-	4.32	5	0.83	8
Reduce queues in the banking hall;	128	-	4.30	5	0.79	9
Encourages price transparency;	128	-	4.10	4	0.80	10

Source: Field survey report 2020 (see questionnaire No.1)

As portrayed in the Table 4.6 the respondent strongly agreed that RTGS transfer technology enhances accessibility of the bank services to both existing and new customers having mean value of 4.82. Similarly, phone interviews conducted with sample banks Mangers supported that in light of advancing the theme of financial inclusion in Ethiopia, RTGS transfer technology plays underpinning role to inundate access to finance through mobile and internet banking. Taking in to account the gap on the demand and supply side on financial access and the untapped potential

market ahead, strategic implementation of the RTGS transfer service will pave the way to enhance access to financial service and thereby brings financial inclusion in Ethiopia.

Next to this benefit entailed towards accessibility, RTGS transfer service increase customer base as per the interviewee. The bricks and mortar approach (Traditional Banking) requires expensive investment and not economically feasible for financial institution. Otherwise, financial inclusion would be a nightmare in Ethiopia unless banks should make strategic shift to alternative channels like RTGS transfer. Thus, respondents' reflection supported such idea and that is why several banks are now trying to manage to get on board of the RTGS business. Since ''Electronic payment and transfer systems can help the unbanked join the banking system with significant benefits to them and to the societies in which they live" (Commonwealth Business Council & Visa, 2004). Besides, an interview conducted with Banking Supervision Directorate Manager at NBE supported that adoption of RTGS transfer technology gives the unbanked population as an important option for bringing cash into the formal economy and also reduce physical circulation of cash.

Another most ranked service benefits identified in this study are adoption and development of RTGS technology in Ethiopia facilitates development of new products and new business in the banking industry, improve customer service and transaction speeds. This is evidenced by the data collected from the respondents with mean score of 4.54, 4.50 and 4.49 respectively.

The respondents also agreed that adoption and development of RTGS transfer technology increase accessibility of the banks services to users in terms of time with mean value found is 4.54. This implies that RTGS system allows an account holder to access and manage bank account and information through their personal computer or mobile phone any time and place. The result further revealed that large number of respondent agreed that other services benefits perceived from adoption and development of RTGS transfer technology in Ethiopia included facilitates marketing and market access (Mean 4.46), create better relationship among banks and clients (Mean 4.34, reduce customers queue at bank hall (Mean 4.30), encourages price transparency (Mean 4.30).

Lastly but not least, another service benefit of adoption and development of RTGS transfer technology in Ethiopia banking industry is overcome geographical limitations i.e. it removes the traditional geographical limitation as it could reach out to customers of different location. This agreement is based on the responses of the respondents with mean score 4.32. Similarly, a phone interview conducted with Mangers of each sampled bank stated that they are used RTGS transfer

technology as a way out as one strategic approach to reduce the investment cost associated with branch expansion and to enhance accessibility of financial services to the unbanked/under banked society.

Comparing tables 4.5 and table 4.6 it can be concluded that banks have better perception of service benefit relative to operational efficiency benefits of adopting RTGS transfer technology in Ethiopia banking industry.

4.3 Driving Forces for adoption & development of RTGS

A total number of 10 questions on "driving forces" for adoption and extension of RTGS transfer services in Ethiopia banking industry were asked to indicate the extent to which each respondent agrees to corresponding closed ended statements rated on a five-point Likert type scales ranging from '1' "Strongly Disagree" to '5' "Strongly Agree". The summary of the results for all statements or variables under the research study and the result with respect to each statement is indicated below. Accordingly, the researcher tried to interpret the Mean value. The researcher also tried to triangulate and complement the result obtained from the interview, open ended questions and the respective associated other literatures findings with the results obtained from the Likert type statements pertaining to similar variables, when found appropriate.

Table 4.7 Driving Forces that Initiate Ethiopian Banks for adoption and Development of RTGS transfer Technology

Driving forces	N		Mean	Mode	Std. Deviation
	Valid	Missed			
Desire to improve organizational performance and productivity;	128	-	4.49	5	0.622
Desire to improve customer service;	128	-	4.34	4	0.648
Existence of high competition in the banking industry.	128	-	4.31	4	0.655
To enhance productivity in the banking industry.	128	-	4.27	4	0.737
Desire to improve the relationship with customers;	127	1	4.24	4	0.704
Desire to cover wide geographical area	127	1	4.21	5	0.867

Desire to build organizational reputation	127	1	4.16	4	0.726
Desire to reduce transaction cost;	128	-	3.94	4	0.842
Desire to satisfy rapid change of customer needs and Preferences	128	-	3.85	4	0.948
Legal frame works that enforce banking industries to adopt technological innovation	128	-	3.64	3	1.048

Source: Field survey report 2020 (see questionnaire No.1)

There are factors influencing adoption of RTGS tansfer technology products in sampled private commercial banks. As depicted in the above Table 4.7 indicated that most respondents agreed that desire to improve bank performance and customer services were the main influencing factors for adoption and development of RTGS transfer technology, in which mean score are founded 4.49 and 4.34, respectively. Significant proportion (44% strongly agree and 54% agree) of respondents also said that competition from other banks has a strong influence for adoption and development RTGS transfer technology in Ethiopia as a mean value is 4.31. Besides, an interview script received from Manger of NIB International Bank confirmed that banks that have commenced RTGS services would lure customers from other bank who have not commenced. Hence, adoption and development of RTGS transfer technology is used as a defensive mechanize against competitive activities. This result is in line with finding by (Isaac, 2005).

The result further revealed that most respondents asserted that desire to improve the relationship with customers, desire to cover wide geographical area and desire to build organizational reputation are found as the main drivers for adoption and development of RTGS transfer technology in Ethiopia. This is evidenced by the data collected from the respondents with mean score of 4.24, 4.21, and 4.16, respectively. Last but not least, other driving factors that initiate the Ethiopia banks for adoption and development of RTGS transfer technology in Ethiopia are desire to reduce transaction cost, to satisfy rapid change of customer needs and preferences and legal frame works that enforce banking industries to adopt technological innovation. This agreement is based on the responses of the respondents with mean score 3.94, 3.85 and 3.64, respectively. In addition, an interview conducted with NIB International Bank project manager confirmed that following NBE directive adopt core banking system, the system leads the bank to introduce payment card.

4.4 Opportunities for RTGS transfer Technology in Ethiopia

Respondents were asked whether they `Strongly agreed, Agreed, Neutral, Disagreed or Strongly disagreed' based on the five questions shown in the appendix-4(table 4) above to confirm the existence of the opportunities for adoption and development of RTGS technology in Ethiopia, Accordingly, the sampled respondents agreed with the idea that the existence of high customers demand, improvement in the banking habit of the society, late adopter of RTGS in Ethiopia banking industry, commitment of the government to facilitate the expansion of ICT infrastructure and to strengthen the banking industry are existing opportunities fostering the adoption and development of RTGS technology in Ethiopia banking industry.

Table 4.8 Opportunities for Adoption and Growth of RTGS technology in Ethiopian Banking Industry.

	N		Mean	Mode	Std. Deviation
	Valid	Missed			
Late adopter opportunities	**128**	**-**	**3.68**	**4**	**0.90**
Commitment of the government to strengthen the banking industry;	**127**	**1**	**3.58**	**4**	**1.01**
The existence of high demand	**127**	**1**	**3.91**	**4**	**0.92**
Improvement in the banking habit of the society	**128**	**-**	**3.82**	**4**	**0.94**
Commitment of the government to facilitate the expansion of ICT infrastructure	**128**	**-**	**3.62**	**4**	**0.97**
Opportunities in the country that initiates the adoption and development of RTGS technology	**128**	**-**	**3.69**	**3.60**	**0.61**

Source: Field survey report 2020 (see questionnaire No.1)

This is evidenced by the data collected from the respondents with mean score of 3.91, 3.82, 3.68, 3.62 and 3.58, respectively. An interview conducted with Banking Supervision Directorate Manager at NBE agreed that the business environment is conducive taking into account the economic growth and stability in the Country and the five years aggressive economic development program by the Government i.e. the Growth and Transformation Plan (GTP). However, the interviewee admitted that there are infrastructural problems such as network and accessibility problems, ICT and other which impact the expansion of technology innovative.

Chapter Five

5. Summary of Findings, Conclusions and Recommendations

This chapter will present summary of the findings and conclusion in section 5.1 and 5.2, respectively. Afterwards, the possible important recommendation and suggestion for further research methods will be presented in section 5.3 and 5.4, respectively.

5.1 Summary of Findings

The objective the study was to identify challenges, benefits, driving forces and opportunities for adoption and development of RTGS technology in Ethiopia. Accordingly, this part of the research summarizes the major findings of the study from the challenge and prospect perspectives.

Despite the numerous benefits that RTGS transfer technology brings to the nation, banks and individuals, it also has its own challenges. The challenges as discussed in the study can be categorized into three main groups i.e. Organizational, environmental and technological. High cost of implementation of RTGS such as cost of ICT equipment and network, software and re-organization, lack of customer awareness with RTGS transfer service provided, and lack of skills and trained staff in implementation and running of RTGS system and resistance to changes in technology among by Board, top Management and staff are described in the study as organizational challenges for adoption and growth of RTGS in Ethiopia banking industry.

Limitation in network infrastructure and internet related support services, lack of ICT infrastructure, lack of sufficient government support and legal and regulatory differences with cross-country are considered the basic external challenges for adoption and development of RTGS transfer technology in Ethiopia. Besides, lack of law mandating the banks to adopt RTGS technology, lack of adequate coordination, interaction and cooperation between banks and other decision making centers in RTGS context, absence of financial networks that links different banks, frequent power disruption, tight foreign currency regulation and lack of uniform platform by banks are another environmental challenges for adoption and growth of RTGS transfer technology in Ethiopia.

In connection with technology factors, lack of customer trust with RTGS services provides by the banks, customer fear of risk to use RTGS technology and security risks are consider as technological factors negatively affect the adoption and growth of RTGS technology in Ethiopia. In this study, majority of challenges for adoption and development of RTGS technology in Ethiopia are derived from the external environments and limitation in network infrastructure and internet related support services is one of basic challenge in adoption and development of RTGS transfer technology in Ethiopia.

The study revealed lists of benefits that the Ethiopia banks realized from adoption and extension of RTGS technology. The benefits were classified as operational and service benefits. Operational benefits identified in this study as agreed by the participant include increase the bank productivity, reduces paper work, reduce transaction cost, generate foreign currency, increase reliability and reducing errors. The study has also described lists of services benefits in the adoption and extension of RTGS technology in Ethiopian banking industry as agreed by the participants, such as facilitates development of new products, facilitates marketing and market access, improve customer service, reduce long queues in banking halls, increase accessibility of the bank services, create good relation among banks and clients and encourages price transparency.

Furthermore, the study revealed lists of factors that initiate Ethiopia banks for adoption and development of RTGS technology as agreed by the participants such as desire to improve bank performance, improve customer services, improve the relationship with customers, improve organizational performance, cover wide geographical area, build organizational reputation and reduce transaction cost. Besides, competitions among banks and rapid change of customer needs and preferences and legal frame works that enforce banking industries to adopt technological innovation have a strong influence on RTGS technology adoption and development in Ethiopia.

Finally, high customers demand, improvement in the banking habit of the society, late adopter of RTGS in technology in Ethiopia, commitment of the government to facilitate the expansion of ICT infrastructure and commitment of the government to strengthen the banking industry are among the major existing opportunities for the adoption and growth of RTGS transfer technology in the country.

5.2 Conclusion

The findings of the study revealed that adoption and development of RTGS transfer technology in Ethiopia banking industry stretches wide across the two extremes of the challenges and prospects where the concerted effort by stakeholders to overcome the challenges will bring about immense opportunities to the dominant players in the field with the ultimate result of transforming the country towards financial inclusion.

Accordingly, a number of conclusions can be drawn from these results. Potential operational efficiency benefits of RTGS transfer adoption and development as perceived by the Ethiopian banks are: increase productivity, reduces paper work, reduce transaction cost, generate foreign currency, increase reliability and reducing errors. Moreover, the banks realized service benefits like, facilitate development of new products, facilitate marketing and market access, improve customer service, reduce long queues in banking halls, increase accessibility of the bank services, create good relation among banks and clients and encourages price transparency. Perceiving both operational and services benefits have positive tendency to adopt and develop RTGS transfer technology among the banks.

Despite the above benefits of adopting and developing RTGS technology in Ethiopian, it is associated with some challenges. The study shows that high cost of ICT equipment and network, software and re-organization, lack of customer awareness and resistance to changes in technology are the major challenges Ethiopian banks facing for adoption and development RTGS transfer technology in Ethiopia. The prevailing technical and managerial skills available in the Ethiopian banking industry towards adopting and extending of RTGS technology are found to be limited to influence the technological development rate. Limitation in network infrastructure and internet related support services, low levels of computer literacy, low level of ICT infrastructure and lack of sufficient government support are considered the basic external challenges facing Ethiopian banks to adopt and develop RTGS transfer technology. Besides, Security risks and lack of trust on the technological innovations are another challenges faced by the Ethiopian banks in adoption and development of RTGS in the country. Therefore, from the above discussion it is possible to conclude that RTGS technology is not well adopted and developed in Ethiopian banking industry and considering adoption and development of RTGS technology in the rest of the world, RTGS is in its beginning or infancy stage in Ethiopia.

The driving forces that initiate the Ethiopian banks for adoption and development of RTGS technology are desire to improve performance, desire to improve the relationship with customers, rapidly changing customers' needs and preferences, desire to improve organizational performance, desire to cover wide geographical area, desire to build organizational reputation and desire to reduce transaction cost. In addition, increasing competition among banks to increase or retain their customer base is driving the banks to adopt and develop RTGS transfer technologies.

Last, but not the least, attempt was made to see if there are any associated opportunities for adoption and development of RTGS technology in Ethiopia banking industry. Accordingly, high demand, improvement in the banking habit of the society, late adoption of RTGS, commitment of the government to facilitate the expansion of ICT infrastructure and commitment of the government to strengthen the banking industry are good opportunities for the adoption and development of RTGS service in Ethiopia.

5.3 Recommendations

Based on the findings the researcher came up with the following possible recommendations to policy makers, the banks, and the government in order to overcome the challenges, exploit the untapped opportunities in adoption of RTGS technology and to ensure a successful practice of RTGS transfer technology in Ethiopia bank industry.

- ⇨ The Banks should create deep awareness to community concerning the RTGS products they offer and the benefits associated with using RTGS services through advertising their products and services on the internet, mass media as well as through organizing public exhibition and talk shows. Besides, the bank should attract the community to use the technology by diverse incentive campaigns. This way, customers' interest would be aroused.
- ⇨ Banks should work to improve customers' confidence by providing adequate security of transaction back up of critical data files and alternative means of processing information.

- ⇨ In collaboration with banks, Government should educate and inform the community on the workability and effectiveness of RTGS transfer technology. This will increase the customer confidence levels.

- ⇨ The banks should facilitate proper and continuous training courses for their employees to have adequate understanding of the RTGS transfer technology so as to achieve the desired objectives.

- ⇨ Government should support banking sector by facilitating development of sufficient ICT infrastructure for the successful implementation and development of RTGS services; and The central bank should issue suitable legal frameworks for adoption of the RTGS transfer technology.

- ⇨ The central bank should issue suitable legal frameworks for adoption of the RTGS and for other electronic banking technology because it enhances customer confidence level.

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Appendix 1; Method of Sampling Technic Summary

No.	Name of the Banks	Est. Date	Year of offering RTGS	Purposive Sampling	Av. No. prof. staffs of RTGS	Stratified Sam. technique. Constant=140/201 = 0.69651	Approx. Result
1	Abay Bank S.C.	2010	2013	AW.IB	30	30*C=20.89552	20
2	Addis Inter. Bank S.C.	2011	2013				
3	Awash Inter. Bank S.C.	1994	2011				
4	Abyssinia Bank S.C.	1996	2013	DB	60	60*C=41.79104	40
5	Berhan Inter. Bank S.C.	2010	2013				
6	Bunna Inter. Bank S.C.	2009	2013				
7	Ethiopian Commercial Bank.	1963	2011	NIB	21	21*C=14.62687	15
8	Coop. Bank of Oromia S.C.	2005	2013				
9	Dashen Bank S.C.	2003	2012				
10	Debub Global Bank S.C.	2012	2014	UB	27	27*C=18.80597	20
11	Enat Bank S.C.	2013	2014				
12	Lion Inter. Bank S.C.	2006	2013				
13	Nib Inter. Bank S.C.	1999	2011	WD	28	28*C=19.50249	20
14	Oromia Inter. Bank S.C.	2008	2013				
15	United Bank S.C.	1998	2012				
16	Wegagen Bank S.C.	1997	2012	ZB	35	35*C=24.37811	25
17	Zemen Bank S.C.	2009	2011				
18	Dev't Bank of Ethiopia.	1901	2012				
Total population of professional staff.					**=201**	**Total Sampled respondents**	**=140**

Source; NBE report 2019, website of individual banks and Phone Interview made with RTGS prof. staff of each banks.

➔ Simple Random Sample determination using the **Yamane** (1967:886)

$$n=N/(1+Ne^2)$$ where **n** is sample size

N is population

1 is constant

$\mathbf{e^2}$ is margin of error. e = 5%.

= 210/ (1+201*5%)

= 210/ (1+0.5025) = 136.777038 ➔ Approx. result = **140.**

Appendix 2

St. Mary's University College

School of Graduate Studies

Masters of Accounting and Finance

Dear Sir/Madam

My name is Elias Lakew, I am M.Sc. student in the Department of Accounting and Finance at St. Mary's University. I am undertaking a research on the topic "Challenges of RTGS in Ethiopian Banking Industry" for the partial fulfillment of the requirements of the Master of Science in Accounting and Finance. The aim of this questionnaire is to identify the challenges of adopting **Real Time Gross Settlement(RTGS)** in Ethiopian Banking Industry. The results of the study will have a paramount important to gather pertinent information. I sincerely assure you that the information you provide will be used only for academic purposes.

Please put the tick mark (√) on the appropriate space as per your choice for each closed-ended question and the appropriate reason for open-ended questions.

Best regard.

Part I. General Information

- Name of the Bank _____
- Year of the Bank establishment_____
- Year of offering the RTGS service in the bank_____
- What type of RTGS services does the Bank provide to its customers
  - ➔ CK- scanning & clearance ☐
  - ➔ Inter- bank Transfer ☐
  - ➔ All service ☐
- Number of technology experts who are involved in the RTGS services_____

Part II. Questions regarding RTGS challenges and opportunities

Below are lists of questioners relating to Adoption of RTGS. Please indicate whether you agree or disagree with each statement by ticking (√) on the spaces that specify your choice from the options that range from 'strongly agree' to 'strongly disagree'.

Key: - SA=Strongly agree A=Agree N= Neutral D= Disagree SD= Strongly Disagree

Factors	No	1) please indicate your choice on Potential challenges that affect to adoption or development use of RTGS transfer technology.	SA 5	A 4	N 3	D 2	SD 1
Organizational Factors	1.1	Lack of customer awareness with E-banking product					
	1.2	Lack of technical and managerial skills in implementation and development of E-banking technology					
	1.3	High cost of implementation of E-banking. (such as cost of ICT equipment and network, software and reorganization					
	1.4	Resistance to changes in technology among by Board, top Management and staff ;					
Technological Factor	1.5	Lack of sufficient government support affect customers' willingness;					
	1.6	Lack of legal framework for E-banking;					
	1.7	Cross-country legal and regulatory differences will have impact on the adoption of new technological innovation in the banking sector.					
	1.8	Lack of law mandating the bank to adopt E-banking technology.					
	1.9	Limitation in network infrastructure and internet related support services;					
	1.10	Customer low levels of computer literacy					
	1.11	Limitation in ICT infrastructure					
	1.12	Lack of adequate coordination, interaction and cooperation between banks and other decision making centers in E-banking context;					
	1.13	Absence of financial networks that links different banks;					
	1.14	Frequent power disruption					
	1.15	Tight foreign currency regulation;					
	1.16	Lack of Uniform Platform by Banks i.e. lack of law mandating the banks to use common software platform;					
	1.17	Relative high cost of internet;					

➔Please kindly state any other Barriers or challenges that the Banks faces in the adoption RTGS in to Ethiopia banking industry.

_____

_____

➔If you agree on most of the above challenges, what measures should be taken to reduce these challenges?

_____

_____

Benefits	No	2) The following are some of the benefits the Banks realized from adoption of RTGS transfer system, please indicate your choice.	SA 5	A 4	N 3	D 2	SD 1
Operational Benefits	2.1	Reduced paper work					
	2.2	Low transaction cost					
	2.3	Enhance productivity in the banking industry					
	2.4	Enhance foreign currency generation					
	2.5	Increase reliability and reducing errors					
Services Benefits	2.6	Facilitates development of new products and new business in the banking industry;					
	2.7	E-banking is convenient, in terms of 7 days and 24 hours services i.e. accessibility; i.e. No time limit to access bank account and information					
	2.8	Enhance accessibility of the bank's services (in terms of place);					
	2.9	Overcome geographical limitations;					
	2.10	Improve customer service;					
	2.11	Improving transaction speeds					
	2.12	Reduce queues in the banking hall;					
	2.13	Facilitates marketing & market access;					
	2.14	Create better relationship among banks and clients;					
	2.15	Encourages price transparency;					

➔Please kindly state any other benefits the banks gained from the adoption of RTGS transfer system in the delivery of service to customers?

_____

_____

_____

No	3) Do you think that the following are among the driving forces for the adoption of RTGS transfer services in Ethiopia Banking Industry?	SA 5	A 4	N 3	D 2	SD 1
3.1	Desire to improve organizational performance and productivity;					
3.2	Desire to improve the relationship with customers;					
3.3	Desire to cover wide geographical area;					
3.4	Desire to build organizational reputation;					
3.5	Desire to reduce transaction cost;					
3.6	Desire to improve customer service;					
3.7	Existence of high competition in the banking industry;					
3.8	Desire to satisfy rapid change of customer needs and preferences					
3.9	Legal frame works that enforce banking industries to adopt technological innovation					

➔ Please kindly state any other Driving forces for adoption E-banking into Ethiopia banking industry.

_____
_____

No	4) What are the existing opportunities in the country that initiates the adoption of RTGS?	SA 5	A 4	N 3	D 2	SD 1
4.1	Late adopter opportunities					
4.2	Commitment of the government to strengthen the banking Industry					
4.3	The existence of high demand					
4.4	Improvement in the banking habit of the society					
4.5	Commitment of the government to facilitate the expansion of ICT infrastructure					

➔ Please kindly state any other opportunities in the country that initiates the adoption of RTGS?

_____
_____
_____

➔ What ways do you think that RTGS can be enhanced in Ethiopia Banking Industry?

_____
_____
_____

➔ Any suggestions regarding the adoption of RTGS service in the banking industry?

_____
_____
_____

Appendix 3

Interview Questions

A. Name of the Bank_____

B. Your Position please_____

1. What type of RTGS service do you provide? Inter-bank transfer, CK-clearances, please specify if there is other service?

2. What are the basic challenges of adopting and developing new electronic payment and transfer technological innovations like RTGS in your institution?

3. What are the benefits your bank gained from the adoption and development of RTGS transfer system in the delivery of service to customers?

4. What are the key factors that push your bank to adopt RTGS transfer system?

5. What are the existing opportunities in the country that initiates the adoption and development of RTGS technology?

6. Is there any legal frameworks at central bank to enforce banking industries to use RTGS transfer technology?

7. Is there any special rule that guide banking industries in implementation of RTGS system? (only for NBE)

8. What sort of support would you expect from the government in relation to the RTGS improvement in Ethiopia?

9. Any suggestions regarding the adoption of RTGS transfer service in the banking industry?

Appendix 4 (Survey Data)

Frequency Tables

Q.1.1Lack of customer awareness with RTGS transfer service.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	10	6	8	9
	Neutral	21	16	16	25
	Agree	73	57	57	82
	Strongly Agree	23	18	18	100
	Total	128	100	100	

Q.1.2 Lack of technical and managerial skills in implementation and development of RTGS technology.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	2	2	2	2
	Disagree	13	10	10	12
	Neutral	27	21	21	33
	Agree	65	51	51	84
	Strongly Agree	21	16	16	100
	Total	128	100	100	

Q.1.3 High cost of implementation of RTGS. (such as cost of ICT equipment, network, software)

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	7	5	5	6
	Neutral	23	18	18	24
	Agree	71	55	55	80
	Strongly Agree	26	20	20	100
	Total	128	100	100	

Q.1.4 Resistance to changes in technology among customers and staff due to:

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	13	10	11.2	12.2
	Neutral	35	27	29.6	41.8
	Agree	63	49	44.9	86.7
	Strongly Agree	16	13	13.3	100
	Total	128	100	100	

Q 1.5 Lack of sufficient government support affect customers' willingness.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	-	-	-	-
	Disagree	5	4	2.9	3.8
	Neutral	26	20	8.7	12.5
	Agree	57	45	43.3	55.8
	Strongly Agree	40	31	44.2	100
	Total	128	100	100	

Q.1.6 Lack of legal framework for RTGS transfer.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	-	-	-	-
	Disagree	11	9	13	13
	Neutral	14	11	16	29
	Agree	69	54	47	76
	Strongly Agree	34	27	24	100
	Total	128	100	100	

Q. 1.7 Cross-country legal and regulatory differences.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	9	7	7	8
	Neutral	17	13	13	21
	Agree	57	45	45	66
	Strongly Agree	43	34	34	100
	Total	127	99	100	
Missed	System	1	1		
Total		128	100		

Q. 1.8 Lack of law mandating the bank to adopt RTGS transfer technology.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	-	-	-	-
	Disagree	18	14	13	13
	Neutral	20	16	16	29
	Agree	60	47	47	76
	Strongly Agree	30	23	24	100
	Total	128	100	100	

Q.1.9 Limitation in network infrastructure and internet related support services.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	4	3	3	4
	Neutral	11	9	9	13
	Agree	55	44	43	56
	Strongly Agree	55	44	44	100
	Total	104	100	100	

Q.1.10 Customer low levels of computer literacy.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	2	2	2	2
	Disagree	2	2	2	4
	Neutral	21	16	16	20
	Agree	58	45	46	66
	Strongly Agree	44	34	34	100
	Total	128	100	100	

Q. 1.11 Limitation in ICT infrastructure.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	-	-	-	-
	Disagree	3	2	2	2
	Neutral	15	12	12	14
	Agree	71	55	56	71
	Strongly Agree	37	29	29	100
	Total	126	98	100	
Missed	System	2	2		
Total		128	100		

Q.1.12 Lack of adequate coordination, interaction and cooperation between banks and other decision making centers in E-banking context.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	6	5	5	5
	Disagree	10	8	8	13
	Neutral	33	26	26	38
	Agree	46	36	36	74
	Strongly Agree	33	26	26	100
	Total	128	100	100	

Q.1.13 Absence of financial networks that links different banks.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	13	10	10	11
	Neutral	33	26	25	37
	Agree	52	41	41	78
	Strongly Agree	28	22	22	100
	Total	127	99	100	
Missed	System	1	1		
Total		128	100		

Q.1.14 Frequent power disruption.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	5	4	4	4
	Disagree	17	13	13	17
	Neutral	29	23	23	40
	Agree	47	37	37	77
	Strongly Agree	30	23	23	100
	Total	128	100	100	

Q.1.15 Tight foreign currency regulation.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	4	3	3	3
	Disagree	17	13	13	16
	Neutral	37	29	29	45
	Agree	44	34	34	79
	Strongly Agree	27	21	21	100
	Total	128	100	100	

Q.1.16 Lack of Uniform Platform by Banks i.e. use common software platform.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	18	14	14.3	15
	Neutral	33	26	26.7	42
	Agree	58	45	44.5312	87
	Strongly Agree	17	13	13.3	100
	Total	128	100	100	

Q.1.17 Relatively High cost of Internet.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	6	5	4.8	4.8
	Disagree	34	27	26.7	31.5
	Neutral	39	31	30.5	62
	Agree	41	32	32.4	94.4
	Strongly Agree	7	6	5.7	100.1
	Total	128	100	100	

Q.1.18 Customer fear of risk to use RTGS technology.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	4	3	3	3
	Disagree	7	5	5	9
	Neutral	17	13	13	22
	Agree	75	59	59	80
	Strongly Agree	25	20	20	100
	Total	128	100	100	

Q.1.19 Loss of Audit Trail

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	5	4	3.8	3.8
	Disagree	24	19	19	23
	Neutral	56	44	44	67
	Agree	31	24	24	91
	Strongly Agree	12	10	10	100
	Total	128	100	100	

Q.1.20 Money laundering and other financial crimes are easily facilitated through RTGS.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	5	3.8	3.9	3.9
	Disagree	29	22.9	23.3	27.2
	Neutral	50	37.1	37.9	65
	Agree	37	28.6	29.1	94.2
	Strongly Agree	7	5.7	5.8	100
	Total	128	98.1	100	

Q.1.21_ Users do not trust the RTGS technology provided by banks.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	5	4	4	4
	Disagree	6	5	5	8
	Neutral	16	13	13	13
	Agree	63	49	49	21
	Strongly Agree	38	30	30	100
	Total	128	100	100	

Q.1.22 Customer fear of risk to use RTGS transfer technology.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	12	9	5	6
	Neutral	22	17	11	16
	Agree	56	44	42	58
	Strongly Agree	37	29	42	100
	Total	128	100	100	

Q.2.1 Reduced paper work.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	2	2	2	2
	Disagree	5	4	4	6
	Neutral	45	35	35	41
	Strongly Agree	76	59	59	100
	Total	128	100	100	

Q.2.2 Low transaction Cost.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	6	5	5	6
	Neutral	13	11	11	16
	Agree	54	42	42	58
	Strongly Agree	54	42	42	100
	Total	128	100	100	

Q.2.3 The adoption of E-banking will enhance productivity in the banking industry.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	1	1	1	2
	Neutral	2	2	2	4
	Agree	34	27	27	31
	Strongly Agree	88	69	69	100
	Total	127	100	100	
Missed	System	1			
Total		128			

Q.2.4 Enhance foreign currency generation.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	2	2	2	2
	Disagree	4	3	3	5
	Neutral	22	17	17	22
	Agree	41	32	32	54
	Strongly Agree	59	46	46	100
	Total	128	100	100	

Q.2.5 Increase reliability and reducing errors.

		frequency	Percentage	Valid percentage	Cumulative percentage
	Disagree	15	12	12.4	12.4
	Neutral	31	24	22.9	35.2
	Agree	55	43	43.8	79
	Strongly Agree	27	21	21	100
	Total	128	100	100	

Q.2.6 Facilitates development of new products and new business in the banking industry.

		frequency	Percentage	Valid percentage	Cumulative percentage
	Disagree	1	1	1	1
	Neutral	6	5	5	6
	Agree	44	34	34	40
	Strongly Agree	77	60	60	100
	Total	128	100	100	

Q.2.7 RTGS is convenient, in terms of 7 days and 24 hours services i.e. accessibility.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	4	3	3	4
	Neutral	6	5	5	9
	Agree	42	33	33	41
	Strongly Agree	75	56	56	100
	Total	128	100	100	

Q.2.8 Enhance accessibility of the bank's services (in terms of place).

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Neutral	1	1	1	1
	Agree	46	36	36	37
	Strongly Agree	81	63	63	100
	Total	128	100	100	

Q.2.9 Overcome geographical limitations.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	4	3	3	4
	Neutral	12	9	9	13
	Agree	48	38	38	51
	Strongly Agree	63	50	50	100
	Total	128	100	100	

Q.2.10 Improve customer service.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Disagree	1	1	1	1
	Neutral	4	3	3	4
	Agree	52	41	41	45
	Strongly Agree	71	55	55	100
	Total	128	100	100	

Q.2.11 Improving transaction speeds.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Disagree	1	1	1	1
	Neutral	5	5	3	6
	Agree	51	40	40	46
	Strongly Agree	70	55	55	100
	Total	128	100	100	

Q.2.12 Reduce queues in the banking hall.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Disagree	4	3	3	2.9
	Neutral	14	11	11	14.6
	Agree	49	38	38	52.4
	Strongly Agree	61	48	48	100
	Total	128	100	100	

Q.2.13 Facilitates marketing & market access.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Disagree	1	1	1	1
	Neutral	5	4	4	5
	Agree	52	41	41	46
	Strongly Agree	69	54	54	100
	Total	127	100	100	
Missed	System	1			
Total		128			

Q.2.14 Create better relationship among banks and clients.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Disagree	2	2	2	2
	Neutral	9	7	7	9
	Agree	56	44	44	53
	Strongly Agree	60	47	47	100
	Total	127	100	100	
Missed	System	1			
Total		128			

Q.2.15 Encourages price transparency.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Disagree	2	2	2	2
	Neutral	28	22	22	24
	Agree	54	42	42	66
	Strongly Agree	44	34	34	100
	Total	128	100	100	

Q.3.1 Desire to improve organizational performance and productivity.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	1	1	1	2
	Neutral	6	8.6	8.6	11
	Agree	47	49.5	49.5	60
	Strongly Agree	73	40	40	100
	Total	128	100	100	

Q.3.2 Desire to improve the relationship with customers.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Disagree	2	2	2	2
	Neutral	9	7	7	9
	Agree	64	50	50	99
	Strongly Agree	51	40	40	100
	Total	126	99	100	
Missed	System	2	1		
Total		128	100		

Q.3.3 Desire to cover wide geographical area.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Disagree	7	6	6	6
	Neutral	12	11	9	15
	Agree	52	38	41	56
	Strongly Agree	56	44	44	100
	Total	127	99	100	
Missed	System	1	1		
Total		128	100		

Q.3.4 Desire to build organizational reputation.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Disagree	1	1	1	1
	Neutral	20	16	16	17
	Agree	60	16	47	64
	Strongly Agree	46	34	36	100
	Total	127	99	100	
Missed	System	1	1		
Total		128	100		

Q.3.5 Desire to reduce transaction cost.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	4	4	4	5
	Neutral	29	21	21	26
	Agree	61	49	49	74
	Strongly Agree	33	25	26	100
	Total	128	100	100	

Q.3.6 Desire to improve customer service.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Disagree	1	1	1	1
	Neutral	10	7	6.7	8
	Agree	62	50	49.5	57
	Strongly Agree	55	43	42.9	100
	Total	128	100	100	

Q.3.7 Existence of high competition in the banking industry.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Disagree	2	2	2	2
	Neutral	6	5	5	7
	Agree	68	53	53	60
	Strongly Agree	51	40	40	100
	Total	128	100	100	

Q.3.8 Desire to satisfy rapid change of customer needs and preferences.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	11	9	9	10
	Neutral	28	22	22	32
	Agree	54	42	42	73
	Strongly Agree	34	27	27	100
	Total	128	100	100	

Q .3.9 Legal frame works that enforce banking industries to adopt technological innovation.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	17	13	13	14
	Neutral	43	33	33	48
	Agree	33	26	26	73
	Strongly Agree	34	27	27	100
	Total	128	100	100	

Q.4.1 Late adopter opportunities.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	2	2	2	2
	Disagree	7	6	6	8
	Neutral	40	31	31	39
	Agree	56	44	44	83
	Strongly Agree	22	17	17	100
	Total	128	100	100	

Q.4.2 Commitment of the government to strengthen the banking industry.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	6	5	5	5
	Disagree	11	9	9	14
	Neutral	27	35	21	35
	Agree	63	35	50	84
	Strongly Agree	19	15	15	100
	Total	127	99	100	
Missed	System	1	1		
Total		128	100		

Q.4.3 The existence of high demand.

		frequency	percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	1	1	1	1
	Disagree	9	7	7	8
	Neutral	20	20	16	24
	Agree	63	44	50	73
	Strongly Agree	34	29	27	100
	Total	127	99	100	
Missed	System	1	1		
Total		128	100		

Q.4.4 Improvement in the banking habit of the society.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	4	3	3	3
	Disagree	7	6	6	9
	Neutral	26	20	20	29
	Agree	63	50	50	78
	Strongly Agree	28	22	22	100
	Total	128	100	100	

Q.4.5 Commitment of the government to facilitate the expansion of ICT infrastructure.

		frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Strongly Disagree	5	4	4	4
	Disagree	10	8	8	11
	Neutral	35	28	28	39
	Agree	57	45	45	84
	Strongly Agree	21	16	16	100
	Total	128	100	100	

The end.