



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF BUSINESS ADMINISTRATION**

**THE ADOPTION OF FINTECH IN ETHIOPIA FINANCIAL
INSTITUTION:**

**THE CASE OF BANK OF ABYSSINIA IN
ADDIS ABABA**

BY- SALEM HAILEMICHAEL BIRU

JULY, 2024

ADDIS ABABA, ETHIOPIA



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**JULY, 2024
ADDIS ABABA, ETHIOPIA**

Declaration

I **Salem Hailemichael**, the under signed, declare that this thesis entitled: “**The Adoption of FinTech in Ethiopian Financial Institutions: The Case of Bank of Abyssinia in Addis Ababa**” is my original work. I have undertaken the research work independently with the guidance and support of the research supervisor. This study has not been submitted for any degree or diploma program in this institutions and that all sources of material used for the thesis has been duly acknowledged.

Name of student

Signature

Date

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Acronyms /Abbreviations

ANOVA: - Analysis of variance

S.C = share company

SPSS =Statistical Package for Social Sciences

VIF =Variance Inflation Factor

Abstract

FinTech is a crucial aspect of today's applied technology that offers unlimited possibilities as a strategy to attract and retain staffs. In addition to that it has changed the pattern in performing t business. The Ethiopian banking industry is also shifting in the advent of this financial technology to put both the banks and the staffs in a win-win situation. Hence, the researcher attempted to study on the facts that affect Adoption of FinTech in Financial Institutions in Case of Bank of Abyssinia in Addis Ababa, The study used descriptive and explanatory research design nature and data were gathered through questionnaires. In order to achieve the objective of the study, probabilistic samplings technique were used. A sample size of the study was (n = 191). Data collected with structured questionnaire was analysis using descriptive and inferential statistics. The findings of the study indicate that relative advantage, compatibility, Triablity and Observation were found that they significantly affected the Adoption of FinTech in BoA. The major results of the study thus indicates that those four variables significantly determine the adoption of FinTech in BoA in the case of Addis Ababa Based on this, the study recommends that the bank needs to evaluate available Fintech aspects in terms of their, relative Advantage, compatibility, trialability, and observability for proper and relevant integration into the existing bank systems..

Key words: Reliability, Compatibility, Observability, Complexity, Trialability, Adoption of Fintech

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over the past century, traditional financial services have undergone substantial transformation, but today a new era of financial services known as "FinTech" has evolved. FinTech is a widespread phenomenon that is evolving day by day as more and more tech entrepreneurs enter the industry and transform the industry to meet the needs of society (Liudmila, 2016). On the one hand, FinTech can be seen as a financial service where innovative technologies intervene to meet future needs such as high efficiency, cost savings, business process improvements, speed, flexibility and innovation (Arner et al. 2016).

Fintech refers to the innovative procedures and goods that are now accessible for financial services as a result of advances in digital technology. Fintech is specifically described by the FSB (2017) as financial innovation that is technologically enabled and may lead to new business models, applications, processes, or products with a meaningful impact on financial markets and institutions as well as the provision of financial services. Basically, FinTech is the commonly used acronym for Financial Technology, which is currently a label and one of the trending industries in the current digital age. This is largely because of the fact that financial technology has the potential to transform and bring about substantial changes in the way of life as well as in the ways that business is conducted.

The time period FinTech turned into first coined via way of means of a New York banker in 1972. FinTech companies are those that offer services like payment options, online marketplace lending, mobile apps, financing, foreign exchange and remittances, investments, distributed ledger technology, digital currencies, mobile wallets, artificial intelligence and robotics in finance, crowd funding, insurance, and wealth management (Vijai, 2019). While there is no widely accepted definition of what falls under the term FinTech, there is an expanded definition that is considered to include (Digital Finance Institute, 2016). Therefore, growing technology-enabled trends that foster innovation have had a substantial impact on and influence over the financial services sector.

The world of finance is changing dramatically as technology introduces and enables new paradigms. Banking, insurance, investments and credit analysis are all undergoing transformational changes and even the basic concept of money is no longer the same. New financial technologies (FinTech) have erupted around the world (Kaluri & Milne., 2018). FinTech or Financial Technology refers to a firm merging the upcoming technological trends to provide better financial solutions to its clients in the form of digital payments and transactions (Shrivastava, 2020).

The significance of the financial sector for economic expansion underscores the significance of financial innovation. It is possible to think of financial innovation as a brand-new entity that focuses on lowering costs and risk or offering stakeholders products, services, or equipment that more effectively addresses their needs than current alternatives in 2014 (Frame and White). Due to technology advancements in the financial services industry, the current scenario is crucial in terms of significant media and industrial sources, which are inevitably involved in some societal discourses and consequently give rise to the term FinTech. Only a few academics have discussed the FinTech industry, despite the fact that a significant quantity of study focuses on the banking and financial services fields.

Nearly a quarter of adults in the world do not have access to a basic bank account. Financial technology (FinTech) innovations, such as mobile money, are one way to bridge this gap. Examples include M-Pesa in Kenya, OiPaggo in Brazil and TCASH in Indonesia. All provide individuals with cheaper, easier, faster and more efficient ways of storing and transferring value. These efforts contribute to bridging the financial exclusion gap. Few FinTech firms in the global south have been able to replicate the success of FinTech innovations to reduce financial exclusion.

There are now more chances for fintech businesses and financial innovation in Ethiopia due to the country's sizable unbanked population, the government's current digital drive, and recent financial changes. Ethiopia, which has a population of over 112 million, is the second-most populous country in Africa and has the fastest-growing economy on the continent, with double-digit annual growth for the previous ten years. With 17 million smart phones and 45 million mobile staffs, Ethiopia has a population that is under 25 years old and about 65% of them are under the age of 35. According to data from the World Bank, Ethiopia is also one of the poorest countries in Africa with a per capita income of US\$850, and 65% of its adult population lacks access to a bank. Large-scale reforms are currently under process with the

aim of bringing Ethiopia into the digital age, encouraging innovation, and enhancing financial inclusion. Due to inadequate research and significant issues in nations with weak technological infrastructure, like Ethiopia, this industry provides a challenging environment. Without a question, the previous ten years have seen significant changes in traditional financial technologies.

Ethiopia has been gradually embracing FinTech, and there have been efforts to expand financial and banking services to the population through the use of technology. In 2019, the Bank of Abyssinia, along with Wegagen Bank, announced a partnership with WorldRemit to enable digital money transfers. This indicates that the Bank of Abyssinia has taken steps towards incorporating digital solutions into its operations. Thus, the researcher is inspired to conduct study entitled the adoption of FinTech in Ethiopian financial institutions with special reference of Bank of Abyssinia.

1.2 Statement of the Problem

New digital technologies present both game-changing opportunities for and existential threats to companies whose success will be built during the pre-digital economy (Sebastian et al., 2017). In emerging economies digital financial technology has the potential to provide access to financial services for unbanked and un-served, particularly for women. Expansion of financial service through digital financial technologies unlock productivity and investment gaps, reduce poverty, empower women, and help build stronger institutions with less corruption all while providing a profitable, sustainable business opportunity for financial service providers.

Consequently, the introduction of digital financial technologies allows the customer to access financial services at an affordable price that creates profitably, boosting financial inclusion, and enabling large productivity gains across the economy. Despite this fact, financial technologies will be not deployed and optimally utilized in all emerging economies with the potentials of the society or consumers in the nations. Countries like Ethiopia, Nigeria, and Egypt exhibited less development of Digital Financial Services (DFSs) particularly in mobile money (GSMA, 2017; State of the Industry Report on Mobile Money, 2017). According to this report shows that, on these countries with a combined adult population of over 242 million, and most populated in Africa had limited availability of mobile money services and low rates of financial inclusion. On the contrary, an exemplary deployment experience of

mobile money will be found in sub-Saharan countries like Kenya. In this deployment over 60% of the adult population has a mobile money account (GSMA, 2018 State of the Industry Report on Mobile Money, 2018).

The empirical studies on overseas shown that in the adoption of the banking technologies resulted in staffs' satisfaction and loyalty in many countries (Jo, 2018 Kaur & Kiran, 2014; Sathiyavany & Shivany, 2018). It witnessed that positive motivation from bank staffs side helps the bankers to achieve their market penetration strategy and as well as organizational profitability (Anderson, Fornell, & Lehmann, 1994; Luo and Homburg, (2007). However, the acceptance of those banking technology is not easy from staffs` point of view especially in developing countries. However, some an investigation by (Saksonova and Merlino, (2017) revealed that, there is weak adoption of the innovation because of lack of awareness of bank staffs on new financial technology products. In addition to this, compatibility, observability and adaptability are identified as influencing factors on the behavioral intention to adopt digital banking services (Tiong, 2020) (Al-Ajam&Md-Nor, 2013). Factors such as financial risk, legal risk and operational risk have identified as a significant and negative effect on the intention to use FinTech (Keong, et al. 2020). Only few researchers conducted research in the area of FinTech in Ethiopia context. For instance Zewedu (2014) examined the link between financial inclusion, regulation, and inclusive growth. He found progress made in previous years but no change in the level of financial inclusion owing to lack of physical access. Similarly, Tafesework (2020) will be conducted study in FinTech focused on the role the role of DFS and Fin-techs for financial inclusion.

The Ethiopian FinTech ecosystem refers to the network of financial technology companies, financial institutions, investors, and other stakeholders operating in Ethiopia that are involved in the development and delivery of financial services and products that use technology. However, it is worth noting that the adoption of FinTech in Ethiopian financial institutions, including the Bank of Abyssinia, may still be in its early stages. Some banks in Ethiopia have been late in adopting mobile banking and self-service technology. Nevertheless, there is a growing recognition of the importance of technology in the banking sector, and banks have been adapting and embracing technology in recent years.

The National Bank of Ethiopia released a new Payments Instruments Issuers Directive in March 2021, opening up the market for mobile money services to local non-bank actors like mobile network operators. Historically, the provision of digital financial services has been

strictly regulated by traditional banks. The national digital transformation plan Digital Ethiopia 2025, which aims to use cutting-edge technology to assure economic growth and social development, will be then approved by the Council of Ministers in June (Fintech news, 2021).

In Ethiopia, where only 30% of people own a financial account (modern), there is a need for increased financial inclusion, the majority of people in Ethiopia prefer traditional financial services as a result of their culture and way of life. As the study indicates Intellectual information and technological artifacts have peculiar qualities that set them apart from other resources (Galende, 2006). Hence, it has the potential to greatly improve access to financial services for many people in the country who currently do not have access to financial services. This can be seen by the increasing numbers of mobile banking, mobile money and digital payment service providers in the country.

There are currently around 14 million debit cards in Ethiopia and near to 3,000 FINTECHs, which are primarily located in Addis Ababa; credit cards do not currently exist, leaving a massive need for digital financial services to close the gap. Although, the adoption of FinTech also faces a number of challenges, such as limited access to infrastructure and a lack of a clear regulatory framework, which need to be addressed in order to promote its growth and development. Besides, considering the 16 million Ethiopians without a bank account, mobile phone or form of identification, there is a major financial inclusion gap to address. Thus, this study will do to identify the gaps and challenges in the adoption of FinTech by financial institutions in Ethiopia, focusing on the Bank of Abyssinia as a case study.

1.3 Objectives of the Study

1.3.1 General Objective:

- The main objective of this study is to investigate the adoption of FinTech in Ethiopian Financial Institutions in the Case of Bank of Abyssinia.

1.3.2 Specific Objectives

The following are the specific objectives of the study

- To identify the effect of **Relative Advantage** on Adoption of FinTech in BoA.
- To examine the effect of **Complexity** on Adoption of FinTech in BoA.
- To find out the effect of **Compatibility** on Adoption of FinTech in BoA.
- To identify the effect of **Trialability** on Adoption of FinTech in BoA.

- To investigate the effect of **Observability** on Adoption of FinTech in BoA.

1.4 Hypothesis of the Study

The study has formulated the following hypotheses in line with the objectives of the study.

Ho1: There is no significant effect of Relative Advantage on Adoption of FinTech in BoA.

Ho2: There is no significant effect of Complexity on Adoption of FinTech in BoA.

Ho3: There is no significant effect of Compatibility on Adoption of FinTech in BoA.

Ho4: There is no significant effect of Trialability on Adoption of FinTech in BoA.

Ho5: There is no significant effect of Observability on Adoption of FinTech in BoA.

1.5 Significance of the study

The significance of the study can be seen from different perspectives. The research may be used as a stepping-stone for managers of the Banks. It also enables decision-makers to know what the factors affecting of the adoption of FinTech in Ethiopian Financial institution in the case of Bank of Abyssinia. The study finding will help scholars to add more knowledge on the area of the activities of adoption of FinTech. The finding and recommendation from this study was provided means of designing appropriate strategies and directives that can support to address the inefficiency of adoption of FinTech.in BOA.The finding of the research also can be a base for further study and a reference.

1.6 Scope of the Study

As the adoption of FinTech in Ethiopian Financial institution are complex. Thus, due to financial and time constraints this study will focus on the case of Bank of Abyssinia. Additionally, for its manageability, the study will delimit to the adoption of FinTech, in the case of Bank of Abyssinia, Head quarter in Addis Ababa. The researcher believes that focusing on specific area foster accuracy and better quality of data collection work and considerations of the accessibility of relevant data and information's from the study area. In addition, the research methodology will uses both qualitative and quantitative approach that will help to collect from February – March 2024.

1.7 Definition of Key Terms

The following are the Key Terms used in the study.

- **Fintech:** Fintech, or financial technology, is a term used to describe any technology that delivers financial services through software. It is a catch-all term for technology used to augment, streamline, digitize or disrupt traditional financial services. (Julia Kagan, 2023)

- **Financial inclusion:** It is the availability and equality of opportunities to access financial services that meet the needs of individuals and businesses. These services include banking, loan, equity, insurance, payments, savings, credit, and insurance products. (Nanda, K; and Kaur, M, 2016)
- **Digital Financial Service:** It enabled by Fintech, has the potential to lower costs, increase speed, security and transparency and allow for more tailored financial services that serve the poor at scale. (Staschen, 2018)
- **Adaption of technology:** Technology adoption refers to the successful integration of new technology into your business. Adoption means more than just using technology. When you've adopted new technology, you'll use it to its fullest potential and see the benefits of using the new system. (Khraisha, 2018)
- **Financial service:** It refer to products and services offered by institutions like banks for the facilitation of various financial transactions and other related activities in the world of finance. (Gada, 2018)
- **Financial innovation:** refers to the creation of new financial products, services, or processes. This can include updated technology, risk management, risk transfer, credit and equity generation, and many other innovations. (Aardhra, 2016)
- **Innovation technology:** It is the creation and application of new or improved technologies, tools, systems, and processes that bring about significant advancements or breakthroughs in various fields. (Shrivastava, 2020).

1.8 Organization of the Study

This thesis will organize in to five chapters. The first chapter dealt with the introductory part of the study. Which includes background of the study, significance of the study, statement of the problem, objectives of the study, scope and limitation of the research. The second chapter would be a brief literature review regarding the research topic. The research methodology and design will discuss in the third chapter. Chapter four dealt with research analysis and interpretation of the finding and finally summery of the major findings, conclusion and recommendation will discuss under chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This section outlines the literature review, which is mainly focused on how Fintech play a significant role to deepen financial inclusion, and organized as a theoretical and empirical literature review plus the summary of the review.

2.2. Theoretical Literature Review

2.2.1. Definition of Fintech

Traditionally most of the providers in the ecosystem will be financial service providers particularly banks. The technological development in the world shifts the monopoly nature of banks in the delivery of financial services in the ecosystems by including others. These are mainly non-financial players diversify and invest in mobile-based payment businesses in order to gain market access in the payments space and then leverage their experience to strengthen portfolio companies. Consequently, in Asia's financial ecosystem non-banks play a major role, which constitutes a significantly different set of players than markets in Sub-Saharan Africa or the Middle East and North Africa. In addition to mobile money providers, the Asian market also hosts a sizeable number of Fintechs such as Alipay and tech giants such as Tencent. These players have been partners and develop many customer-centric use cases to enhance services in transportation and food, medical and financial services. Alipay alone has partnered with more than 200 financial institutions and offers over 2,500 mutual investment funds and is integrated with over 100,000 merchants outside China (GSMA, 2018 State of the Industry Report on Mobile Money, 2018).

Financial technology (Fintech) is a new industry that uses new technologies and innovation to improve activities in finance and aims to compete with traditional financial methods in the delivery of financial services (Silva, 2018). Fin-tech leverages technology for the design and delivery of financial services and products in an innovative way. Fin-Tech usually covers all aspects of the bank-client relationship and creates digital alternatives that are more efficient, offering lower cost, more convenience, and overall a better user experience. It has emerged as the platform bringing together banks and major service providers such as utilities, telecom, transportation, card schemes, retailers, healthcare, education, etc (Mehrotra, 2019).

The technological breakthroughs within the scope of financial services change the payers in the ecosystems. These changes brought economic growth through innovative financial services (Liudmila Zavolokina*, 2016) . Fintech companies can provide more innovative and customer-centric business models. These disruptive organizations are gradually gaining market share and profits against traditional financial services, which are in serious need of reviewing their business models and changing strategy in order to be more competitive in the market (Nicoletti, The Future of FinTech, 2017).

Fintech in Southeast Asia, Ant Financial, expand its presence through the acquisition of Paytm in India, Mynt in the Philippines and bKash in Bangladesh. It has also entered into a strategic partnership with MoneyGram, and in Kenya partnered with Equitel and Red Dot Payments to serve Chinese tourists. A Singapore-based ride-hailing giant, Grab, first expanded into mobile payment services, is now available in major Southeast Asian markets such as Indonesia, Malaysia, the Philippines, and Vietnam. Grab's most recent move in digital payments is partnering with MasterCard to offer its 110 million+ registered users a virtual prepaid card to enable online payments and the possibility to cash-out (GSMA, 2018 State of the Industry Report on Mobile Money, 2018). In Latin Abyssinia, the fin-tech companies have also promoted DFS. This has been manifested by MercadoLibre. It has become the most popular e-commerce platform in the region. With its marketplace, Mercado Pago, at its center, MercadoLibre has expanded into offering a range of payment and financial services, such as credit and wealth management, serving both MSMEs and individual users. Telecom Social platform Commercial platform Payment services Non-transactional financial services Mobile operators (GSMA, 2018 State of the Industry Report on Mobile Money, 2018).

2.2.2 Fintech s Developments

For centuries, technological progress has been an important force in the transformation of finance. In recent years have witnessed a rise in automation, specialization, and decentralization, while financial firms have found increasingly efficient and sophisticated ways of leveraging vast quantities of consumer and firm data (Fintech and Financial Services, 2017). These undergoing a major transformation, brought about by the rapid development and spread of new technologies. The confluence of 'finance' and 'technology' is often referred to as 'Fintech', typically describing companies or innovations that employ new technologies to improve or innovate financial services. 'Fintech' developments are seen across all areas of the financial sector, including payments and financial infrastructures,

consumer and SME lending, insurance, investment management, and venture financing (World Bank H. N., 2017). Fintech is a term used to denote firms that offer modern technology in the financial sector with a clear idea to introduce new products and improve existing ones. Fintech has a clear idea of how to introduce new or how to improve existing services in the financial services market (Svetlana Saksonova1, 2017).

2.2.3. Challenges of FinTech

The Fintech has been provided to all; particularly it is important for financially excluded in developing and emerging economies. This exclusion is mainly manifested by women, farmers, and others who don't have access to formal financial services. However, Fintech is not the only means to create a financially included society unless it is supported by appropriate regulations and consumer protections, good physical infrastructure, awareness, and trust in digital channels, among other factors. Lack of attention to these challenges can undermine the uptake of DFSs (Innovative financial technologies to support livelihoods and economic outcomes, 22 June 2018).

a) Regulations

The regulation has different perspectives for providers in different countries, as it allows more players in the ecosystem and others are more rigid and monopolized by limited financial service providers. Thus financial regulators should consider policies to allow potential digital finance service providers to enter into the market without being attached to a bank. The government needs to place appropriate regulations and customer protections to safeguard users from fraud, particularly for excluded ones, and promote interoperability across the provider (Innovative financial technologies to support livelihoods and economic outcomes, 22 June 2018) .

The most successful providers today overwhelmingly operate in markets where regulation is enabling. Conversely, restrictive regulatory frameworks can stifle investment, limit the rollout of new services, and raise costs for consumers, all of which can negatively affect adoption and activity rates. Thus, new regulatory developments appeared encouraging, yet their layers of complexity reveal increasingly restrictive requirements. Globally, the DFS particularly the mobile money industry encountered developments in five main areas of regulation in 2018, which affect the supply of DFS like taxation; Know Your Customer (KYC) requirements; cross-border remittances; national financial inclusion strategies; and data regulation (GSMA, 2018 State of the Industry Report on Mobile Money, 2018).

b) Infrastructure

Infrastructure is a critical tool to deliver the DFS; these are reliable electricity, mobile network, and internet connectivity. These help users and providers to build trust in the delivery of DFS. If not the poor infrastructure undermines the reliability and exclusion of participants in DFS usage (Innovative financial technologies to support livelihoods and economic outcomes, 22 June 2018). In addition to the physical infrastructure, a well-developed financial service ecosystem is important to promote uptake of DFSs and financial inclusion (Innovative financial technologies to support livelihoods and economic outcomes, 22 June 2018).

c) Awareness and understanding

Awareness and understanding is an important part of promoting and taking of DFSs. Thus to reach low income and financially excluded society requires greater financial awareness and literacy. Moreover, lack of collaboration among providers through interoperability can further reduce the ability of all potential users to experience how to use digital financial technologies (Innovative financial technologies to support livelihoods and economic outcomes, 22 June 2018).

d) Trust

Trust is one of the critical parts of DFS delivery. Consumers should have built trust while accessing their accounts via digital channels. Lack of customer trust in DFS delivery will impact the service up taking, account ownership, and the possibility of improving financial inclusion. This problem is mainly seen in countries that lack strong consumer protection institutions and frameworks. Users' distrust can be caused by a high degree of uncertainty and perceived risk in electronic financial transactions due to digital data security breaches. Users need safety and security in DFS (Innovative financial technologies to support livelihoods and economic outcomes, 22 June 2018).

2.2.4 Legal Review of FinTech

The technology allows new operating models that involve a wider range of actors in the chain of financial services, from design to delivery. This in turn brings new risks and new ways to mitigate them. Thus, the regulators have to prepare themselves to issues a specialized licensing for nonbank DFS providers without being subject to the full range of rules applicable for commercial banks and without being permitted to intermediate funds (CGAP.-

Stefan Staschen, 2018). To protect user interest and subsequent risks related to the new development of the DFS product, the regulator needs to work with innovators in the private sector to promote test-and-learn approaches. These approaches also include regulatory sandboxes which are developed in Singapore and the UK. The regulator should provide equal treatment between established banks and the new nonbank financial service providers (Bank A. D., Financial inclusion in the digital economy. 2016).

Moreover, the regulators should have to work with other stakeholders to create an innovative DFS to create an inclusive society. These can be creating full access to technology to the pyramid so the digital divide must be addressed. To properly address this issue, countries need to focus on ensuring access to the internet for all, supporting digital identification systems for everyone, Allow and promote partnerships between banks to use big data coming from social media or other forms of alternative data to expand access and encourage innovation. And Allow cloud-based solutions especially important for smaller players and in smaller economies where shared, cloud-based solutions can better enable financial players to offer expanded access to financial services. Despite all, the regulator should work on consumer protection and education to bridging the gap in the use of technology, lacking familiarity with digital technology, staffs often experience difficulties as they adapt and learn to trust it. Effective, consumer-centric financial education can address this challenge and protect those consumers against digitization's risks (Bank A. D., Financial inclusion in the digital economy. 2016).

The FinTech revolution starts after the financial crisis of 2008 in the collapse of banks, which are mainly from North Abyssinia. The emergence of start-ups has not followed any particular path or trend across geographies and subsequently emerged in Sub Saharan countries. Consequently, the startups disrupt the financial service delivery of the banks. A large number of all FinTech globally are from the United States. Ironically, most of the financial firms in North Abyssinia are centered in and around the East coast, while a large number of Fintechs have emerged from Silicon Valley, which is on the West coast (Arjunwadkar, 2018).

Fintech is changing the game for the financial services industry by introducing Chatbots for customer service, Machine learning and AI for fraud detection, Omni-channel banking and obsolescence of bank branches, Biometrics for stronger security, and Blockchain for digital transactions. (Five ways Fintech is disrupting the financial services industry (Gada, 2018). Fintech relies on innovative technologies and business models to provide financial services

outside the traditional financial sector. Lending, payments, and cross border transfers are some of the segments most highly affected by this development. 4 “Fintech” covers a range of different models operating in different niches, with different value propositions. The first model is Fintech s as new entrants, startups, and attackers looking to enter financial services using new approaches and technologies. The second model is Fin-techs as incumbent financial institutions that are investing significantly in technology to improve performance, respond to competitive threats, and capture investment and partnership opportunities. The third model is Fintech s as ecosystems orchestrated by large technology companies that offer financial services both to enhance existing platforms (e.g., AliPay supporting Alibaba's e-commerce offering) and to monetize current user data or relationships. The fourth is Fintechs as infrastructure providers selling services to financial institutions to help them digitize their technology stacks and improve risk management and customer experience.

2.2.5 Fintech’s Potentials

Fintech has been finding a way to enter the financial service market, which has mainly been manipulated and run by big financial institutions. These institutions are highly organized to comply with any strong regulatory requirements developed by the regulator. And they had the highest customer base and resources at the time of tough economic conditions. However, Fintech es is innovative fast-moving companies particularly start-ups, focused on innovative technology or process in everything from payments to insurance. And, they have been attacking some of the most profitable elements of the financial services value chain. This has been particularly damaging to the incumbents who have historically subsidized important but less profitable service offerings. Global investments in Fintech more than tripled in 2014, reaching more than \$12 billion. In comparison, banks spent an estimated \$215 billion on IT worldwide in 2014, including hardware, software, and internal and external services. This is a material number, and because it is so highly targeted, the Fintech spending will make an impact (Courbe, 2016).

The potential of Fintech for financial inclusion may be realized with a strategic framework of underlying infrastructure and an enabling policy and regulatory environment to support digital financial transformation. These can be explained by Building digital identification and e-KYC systems to simplify access to the financial system; Digital payment infrastructure is the primary way to facilitate digital financial flows in an economy; It combines all the promotion of account opening and access with the electronic provision of government services, particularly for public transfers and payments, to scale up the use of digital finance

and related services. By supporting access, payments, and savings, together these three pillars provide a foundation for digital financial transformation and financial inclusion (AFI SPECIAL REPORT) Smits³, 2018).

2.2.6. Effects of Fintech

The effect of Fintech for financial inclusion gives a boundless potential to reach the bottom of the pyramid at an affordable cost. It has been challenging the old or traditional technologies and models of business with new models of delivery. It creates financial service accessibility which has not been covered before (Badrudin, 2018). With all development opportunities in financial service delivery, transferring funds across the globe often anonymously, using means such as crypto currencies might increase illicit financial flows. These also risks in transferring and accessing financial accounts that makes customer susceptible to cybercrime. Moreover, the entry of non-traditional players poses new challenges for policy, regulation, and supervision (World Development Report 2016). It is conceivable that the full range of services currently offered by banks, central banks, and certain market infrastructures could be at least partly supplanted by new entrants, automated processes, and decentralized networks. The increased competition is forcing incumbents (banks and non-banks) to react by adopting new technologies, improving service offerings, altering business models, and reducing costs as reported by IMF staff discussion note (Fintech and Financial Services, 2017).

2.2.7. Fintech Regulatory Framework

The availability of high-speed computing advances in cryptography and innovations in machine learning and data analytics are only some of the elements behind the latest fin-tech wave. For supervisors and overseers, is to up-to-date with the developments and learn about their application to finance that requires. The regulators are also equipped with the necessary knowledge to maintain payers' interest like Fintech includes non-bank financial firms, as well as non-financial firms such as tech companies and network operators. Thus, the authorities responsible for the more traditional areas of finance will need to cooperate more with other authorities at the national level to exploit synergies where appropriate, to fill in the gaps, to balance different interests, and to avoid working at cross-purposes. And last one, technology as well as finance now span national borders. Cooperation at the international level is essential. The international cooperation agenda these days has many competing priorities (Caruana, 2016). According to (Gayatri Murthy, 2019) Several regulators are allowing private firms to conduct small-scale, live testing of innovations in a controlled environment

called sandboxes by providing a special exemption, license, or other limited, time-bound exceptions under the regulator's supervision (Jenik and Lauer 2017). Countries that permit sandboxes include Sierra Leone, Kenya, Jordan, Mexico, and Thailand. These sandboxes encourage firms, including Fintech's, to test innovative solutions in a safe and discreet environment to understand staffs and adjust their business models before sorting out what kind of licensing scheme is needed, if any.

2.2.8. Financial Inclusion

The SDGs comprise an ambitious 17 goals. Greater access to financial services is a key enabler for many of them. Financial inclusion helps create the conditions that ultimately bring many of the SDGs within reach. Creating cash lit society using digital payments to distribute social benefits and wages, governments can reduce costs and leakage, while at the same time advancing financial inclusion. Digitizing these payments could bring millions of adults into the financial system for the first time and strengthen the digital financial infrastructure in emerging economies. Switching to digital payments could potentially save significant time and resources for businesses and workers alike. Thus, financial inclusion is an enabler to meet some of the Sustainable Development Goals (SDG) like Eliminating extreme poverty (SDG 1), Reducing hunger and promoting food security (SDG 2), Achieving good health and well-being (SDG 3), Fostering quality education (SDG 4) and Promoting gender equality (SDG 5) (Leora Klapper, 2016).

Financial inclusion has become an important international financial policy objective and the financial regulatory principle and has been incorporated into several international declarations and codes of good practice. Some of the international initiatives to promote financial inclusion include the Maya Declaration on Financial Inclusion (2011) that will be set forth by the Alliance for Financial Inclusion, a network of central banks, financial supervisors and other regulatory authorities from developing and emerging market economies, to improve the economic and social potential of the world's poorest by improving their access to financial services and products. Significantly, the Maya Declaration states that financial inclusion is critical for empowering and transforming the lives of all people, especially the poor, and that policies designed to promote it should also enhance global and national financial stability and market integrity. The G20 has recognized the importance of DFSs in supporting the objective of financial inclusion (Alexander, 18-20 July 2017Financial).

2.2.9. Diffusion Innovation Theory

Diffusion Innovation Theory Diffusion of Innovation (DOI) Theory, developed by E.M. Rogers in the last 50-plus years, in 1962 first edition, is one of the oldest social science theories. It explains how the concept or a product communicated diffused to the consumer or society through time. The result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something different than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. Adoption of a new idea, behavior, or product (i.e., "innovation") does not happen simultaneously in a social system; rather it is a process whereby some people are more apt to adopt the innovation than others. Diffusion of innovation is understanding of trends, and factoring in consumer tendency groups like influencers, early adopters, and those "laggards". This adoption happens in phases, leveraging different types of consumers, one can easily adopt new and the other take time to consume it. The first in line is the innovators who create new ideas and technologies or financial service products. The early adopters are those who want to try new innovative financial product and services and always wants to check the new product and services. The early majority adopters are, those who are willing to acquire new products and services following early adopters. The late majority and laggards are consumers who proof for the innovative financial services, peer pressure to accept new product and services.

The Diffusion of Innovation (DOI) theory, stages by which a person to adopt an innovation shall have awareness about the innovation and decision to adopt. And then the diffusion is accomplished subsequently. Five factors influence the adoption of an innovation, and each of these factors is affecting differently on the above stages to a different extent in the five adopter categories. These are.⁷

- a. **Relative Advantage** - The extent or degree in which an innovation is better than the idea, program, or product it replaces.
- b. **Compatibility** - How consistent the innovation is with the values, experiences, and needs of the potential adopters.
- c. **Complexity** - How difficult innovation is to understand and/or use.
- d. **Trainability** - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.

e. **Observability** - The extent to which the innovation provides tangible results.

However, it works better with the adoption of behaviours rather than cessation or prevention of behaviours. And doesn't take into account an individual's resources or social support to adopt the new behaviour (or innovation). These are among the limitation mentioned in the Diffusion of Innovation Theory.

2.2.10. Theory of Financial Innovations

The role of innovations in economic development is undeniable, financial innovation is explained in different ways and some are defined as the creation of new products and services. Others also define financial innovation as not limited to the creation of products and services and encompass all the activities from the back end to the front to supply an innovative financial product and services. Financial innovation is defined as a process, carried out by any institution, that involves the creation, promotion, and adoption of new (including both incremental and radical) products, platforms, and processes or an enabler of technologies that introduce new ways or changes to the way a financial activity is carried out. This means that financial innovation does not necessarily come from financial institutions. Innovations such as Amazon's one-click payments, Block chain, PayPal, and others are all financial innovations that came from nonfinancial institutions (Khraisha1, 2018)

The application of innovations increases the competitiveness of a business entity and creates value for its owners. The sustainable growth of the modern business entity is impossible without the proper innovation management accompanied by the knowledge, information, reputation, and trust management (Aardhra. V.1, 2016)

The source of the financial innovation can be the internal (Supply-side) and external (Demand side), however, the implementation process is quite similar whether sourced from internal or external. In the contemporary economy, a lot of financial innovations have been introduced but not stayed with patent compared with technological innovations. Thus, the diffusion of financial innovation is quite fast. In the beginning, the new developments are introduced in the less regulated international market and then, after they have been positively verified they are implemented into the more supervised domestic market. Financial innovations that have not succeeded are withdrawn from the market, and after some time their modifications are implemented. The successful financial innovations can be easily imitated by the competitors in the market, so the new financial developments that are introduced by different financial institutions may be quite similar. Thus, the process of

creating and implementing financial innovations is quicker, less complicated, and cheaper than the similar process in case of the technological innovations. The speed of financial innovations diffusion in the global financial system is enhanced by the dynamic development of new communication and information technologies (Aardhra. V.1, 2016).

2.3 Empirical Literature Review

According to Stella (2019.) research entitled Digital Finance and its impact on financial inclusion, Digital Finance plays a vital role in the day to day activities of the people. The findings of the study mention that usability, convenience, accurate timing, and easy interbank account facility has positive impacts on Mobile banking, Low service charge, and accurate timing has significant impacts on mobile wallets (apps) even low service charge has positively impacted the credit card. Hence the study concludes that digital finance (Internet banking, mobile banking, mobile wallets (apps), credit card, and debit card has a significant impact on financial inclusion. Though digital finance has many negatives on an issue like affordability, security, adaptability, etc. Every human being intends to avail the facility of digital finance in their lives.

According to Le Tam and Hanh (2018) financial inclusion has been considered as an enabler for 7 of the 17 Sustainable Development Goals. With the development of industrial revolution 4.0, Fintech is the key driver for financial inclusion, in both developing and developed countries. The roles of Fintech for financial inclusions are clear, focusing on providing all financial services with lower costs, wider and better access (24/7). In Vietnam, a legal framework on Fintech has been developed, the Fintech steering committee has been set up, and Vietnam is preparing the national financial inclusion strategy. The opportunities for Fintech in Vietnam are huge, from the demand side, infrastructure, and the market gap. However, the challenges remained, coming from its nature, legal framework, small transaction, and active client's ratio, and the low awareness of people on Fintech for financial inclusions. The recommendations to Fintech companies, commercial banks, State Bank of Vietnam, and other stakeholders have been proposed for better Fintech utilization in promoting financial inclusion (Le, 2018).

According to (Soriano, 2017) the role of digital technologies in financial inclusion from the perspective of new financial technology (Fintech) ventures serving the unbanked and underbanked. Supported by strategy management theories, the researcher identified key factors that impact the success of these Fintech start-ups, as measured by financial

performance and financial inclusion. The results showed that founders with prior financial services experience, the degree of customer-centricity in the company's business model, and strategic partnerships with financial institutions and e-commerce firms, had a significant and positive correlation with financial inclusion (as measured by Active Staffs) and financial performance (as measured by Annual Revenue). A qualitative analysis of 4 Fintech start-ups from the data sample demonstrated that other factors such as scalability, prior start-up experience, and type of product sold (pull vs. push) are also critical to the start-ups' success, and provide insights for further empirical research. This study has immediate practical applications for Venture capital firms and investors that evaluate new technology ventures in financial inclusion by providing a quantitative, data-driven methodology. Finally, the results highlight that a mix of quantitative and qualitative insights is important to move research forward on the vital role that Fintech start-ups play in driving financial inclusion in emerging markets. Apart from the research findings institutions also reflects the role and impacts of DFS and fin-tech to accelerate financial inclusion.

The DFI Principles will be produced in 2016 by the Global Partnership for Financial Inclusion (GPMI), under the Chinese Presidency of the G20. The digital financial inclusion (DFI) Principles are intended to drive the adoption of digital approaches to achieve financial inclusion goals, as well as the related G20 goals of inclusive growth and increasing women's economic participation. The DFI Principles are focussed on the need to provide the financially excluded and underserved with high-quality and appropriate financial products and services and the potential to use digital technologies to achieve this goal, where possible. Importantly, the DFI Principles reflect the fact that access to financial services alone is insufficient. Rather, fostering widespread usage and understanding of responsible DFSs is critical to individual, national and global welfare. The DFI Principles also recognize the need to actively balance the promise of digital innovation with the new risks that rapidly evolving technology introduces (OECD, 2018).

2.4 Research Gaps

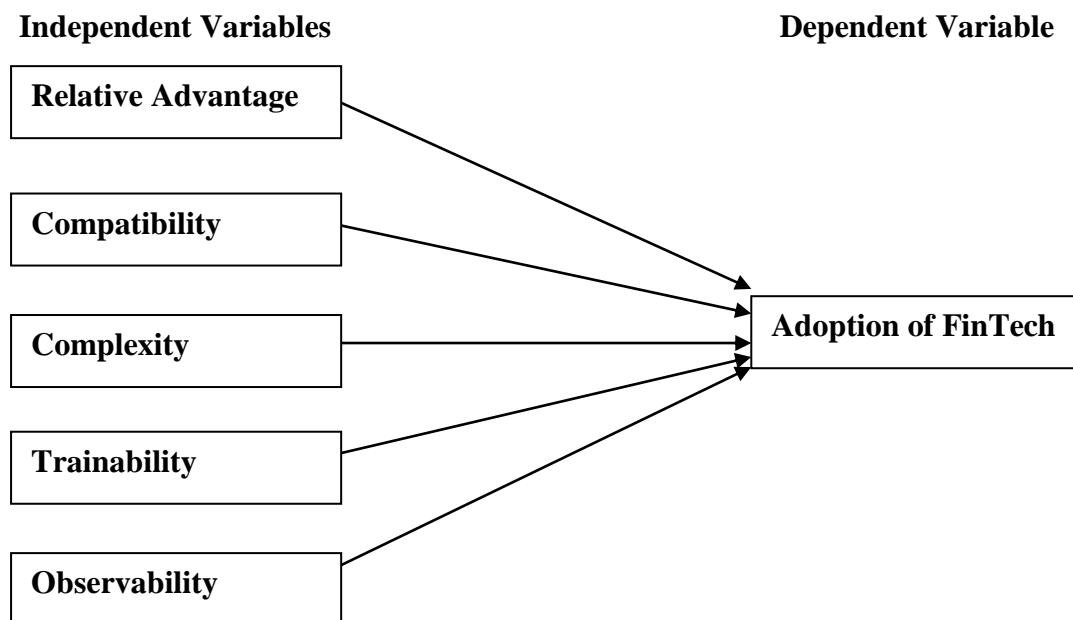
The adoption of financial technology in Ethiopia is a topic of interest for many researchers. A study conducted by Wondwossen and Sharma in 2020 aimed to identify factors that determine bank staffs' intention to adopt e-finance technologies in Ethiopia. The study found that bank staffs' intention to adopt the financial technology will be influenced positively by customer awareness, subjective norm, and perceived usefulness¹. Another study conducted by Yohannes and Tadesse in 2021 investigated the adoption of electronic banking in

Ethiopia. The study identified several factors that influence the adoption of electronic banking, including perceived ease of use, ICT infrastructure, and e-Security. However, those researchers have been gaps to study in the area of adoption of Fintech in the banking area. Therefore, this study will conduct to fill the knowledge gaps by studying the above title, specifically considering the Diffusion of innovation model that proposed by Rogers (1962).

2.5 Conceptual framework

A conceptual framework is a diagrammatical representation that shows the relationship between the independent with the dependent variable. For this study, Fintech’s playing a role in accelerating the financial inclusion of the country. Theoretically, the theory of financial innovations suggests that the application of digital financial innovations enhances financial inclusion while the Technology acceptance model postulate that acceptance of DFSs enhances the accessibility of financial services by various users. And the theory of diffusion of innovation has also dictated the accessibility and expansion of products and services over time. Empirically several studies show that Fintechs influence not only the performance of banking institutions but also enhance the access to financial services without the presence of the traditional banking infrastructure. The study’s conceptual model is shown below figure.

FIGURE 2: 1 CONCEPTUAL FRAMEWORK



Source: E.M. Rogers (1962)

CHAPTER THREE

RESEARCH METHODOLOGY OF THE STUDY

3.1 Research Approach

The research approach is quantitative research approach, in which the researcher tests a theory by specifying specific hypotheses and collecting data to support or refute the hypotheses. The data is collected on an instrument that measures attitudes, and the information is analysed using statistical procedures and hypothesis testing. The assumption of collecting diverse types of data has to provide a more complete understanding of a research problem on qualitative data alone. The study began with a broad survey to generalize results to a population.

3.2 Research Design

The research design for this research is explanatory research design. According to (Creswell, 2014) strategies of inquiry associated with quantitative research is those that invoked the positivist worldview and that originated mainly in psychology. The research is cause-effect in design which measures the degree of cause-effect between two or more variables or sets of scores (Creswell, 2012). Hence, the type of research is explanatory. Moreover in order to explain what things are happening and what things was happened through descriptive design. Such designs have also focuses on elaborate linear equation models that incorporate causal paths and the identification of the collective strength of multiple variables. Apart, all the research will focus on a survey as a strategy to collect data.

3.3 Source of Data and Types of Data

The sources of primary and secondary data collection strategies is used to collect the data. Questionnaire is the main methods used for gathering primary data. In order to comprehensively analyse the challenges surrounding Fintech, reports, directives, proclamations, books, journals, research literature, and websites is used as secondary sources of information. Besides, quantitative data collected through structured questionnaire was used in the study.

3.4 Population of the Study

According to Catherine Dawson (2009), the correct sample size in a study is dependent on the nature of the population and the purpose of the study. Although there are no general rules, the

sample size usually depends on the population to be sampled. Accordingly, the target population of the study was all employees working in the department of FineTech adoption in BoA

3.5 Sample Size

Thus, the researcher used Yemane's formula (1967), in order to determine the sample size of the population at 95% confidence level, with a degree of error expected of 0.05%, and According to BoA head office report, the total number of permanent employees who were working in the areas of adoption of fintech are 384 (BoA Human resource data, 2023). Hence, the sample size of the study is calculated as

$$n = \frac{N}{1 + Ne^2} = \frac{384}{1 + 384 * (0.05)^2} = 196$$

Where:

n= corrected sample size,

N = population size, and

e = Margin of error (MoE), e = 0.05 based on this study.

3.6 Sampling Techniques

To get a representative sample the sampling technique for this study is stratified random sampling technique. A stratified random sampling technique used in order to obtain representatives from each group. It has relative advantages to collect relevant and detailed information from respondents who can share their experiences and insights to the study due to their involvement in providing and facilitating the appropriate services. Accordingly, the population stratified by dividing into departments and participants from each stratum is selected randomly. FinTech is used by several BOA departments. For example, the HR department uses it to monitor and assess employee performance, while the IT department employs it for staff duties. Through Fintech, the Tellers, Operation, and Finance departments additionally offer services to the workers and staffs. Thus, all departments are taken into account when gathering data for this study

Table 3: 1 Sampling Technique

Population	Departments	Population size	Sample size proportion
384 Employees	IT	25	$\frac{25 \times 196}{384} = 13$
	Tellers	51	$\frac{25 \times 196}{384} = 26$
	Operation	253	$\frac{25 \times 196}{384} = 129$
	Finance	22	$\frac{25 \times 196}{384} = 11$
	HR and other staffs	32	$\frac{25 \times 196}{384} = 16$
	Total	<u>384</u>	<u>196</u>

Source: BoA Human Resource data (2023)

3.7 Data Collection Tools

The questionnaire is simply a formalized set of questions for eliciting information (Kothari, 2004). The study is constructing structured questionnaires with close-ended questions to grasp the reliable and valid data regarding assessing factors affecting strategy implementation. The researcher collected data by designing questionnaires. Each question was analysed from different aspects related to the study area. It is designed in a way that is clear, brief, and understandable to the respondents as well as covers the relevant aspects of the study.

To get secondary data, different documents from National Bank of Ethiopia and from concerned departments of the BoA are referred. The researcher also reviewed documents from a case study organization to collect secondary data. This method is used because of its importance in providing background information and facts about the company.

3.8 Methods of Data Analysis

After data is collected through questionnaire, its completeness will be verified, coded, and entered into the computer using SPSS. The data subjected to analysis using an application software package named as Statistical Package for Social Sciences (SPSS). The scoring of the questionnaire is analyzed by using the five-points rating scale or five– Likert scale. Accordingly, data is presented using tables to display the collected data in a concise and meaningful way. The data is finally interpreted based on statistical findings.

Descriptive statistics such as frequency, percentage, means, standard deviations and appropriate graphic presentations were used to obtain a general understanding of the respondents' demographic characteristics.

The test is performed using inferential statistics and SPSS Correlation and SPSS multiple regressions is utilized for analysis. The correlation and multiple regressions of the survey data is analyzed to show the relationship between two variables (dependent and independent) or the effect of one variable on another. Additionally, multiple regression analysis is employed to investigate the effect of independent variables on adoption of FinTech.

The study used the following regression model specification.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

Where, Y = Adoption of FinTech

X₁ – X₅ = Independent variables (Relative Advantage, Complexity, Compatibility, Trialability and Observability respectively).

β_0 = constant

β_1 – β_5 = the beta coefficient of Relative Advantage, Complexity, Compatibility, Trialability and Observability, respectively. ϵ = Std. Error of the Estimate.

3.9 Data Validity and Reliability of Instrument

3.9.1 Validity of Instrument

Validity is concerned with whether the findings are really about what they appear to be about. Kazi (2010), defined the validity as “the degree to which a measure accurately represents what it is supposed to. The questions derived from relevant literature to ensure the validity of the questionnaire. The questioners opted from previous research works that related to this research. Therefore, in this study, in order to assure the validity of the research instrument, various relevant literatures and different previous research questionnaires were used.

In addition, the research advisor is critically check for the validity of the questionnaire. As well, the draft survey questionnaire was passed through a pilot test with selected respondents in order to assure that the instrument is clear and unambiguous. Then, following the above-mentioned means and pilot testing, the researcher incorporated the feedback of the respondents into designing the final survey questionnaire. So, after passing through all of these processes, the research instrument distribute to the respondents.

3.9.2 Reliability of Instruments

According to (Cavana, Delahave, and Sekaran, 2000), reliability is the degree to which measure is free from error and therefore, yields consistent results. According to (Sekaran, 2003), the closer the reliability coefficient gets to 1.0, the better it is, and those values over 0.80 are considered as good. Those values in the 0.70 are considered as acceptable and that reliability value less than .60 is considered being poor (Sekaran, 2003). The appropriate test for reliability is inter-item consistency reliability which is popularly known as the Cronbach's coefficient alpha.

TABLE 4: 1 RELIABILITY TEST

Reliability Statistics	
Cronbach's Alpha	N of Items
.959	6

Source: Survey data (2024)

3.10 Ethical Consideration of the Study

Researchers should adhere to guidelines that are associated with authorship, copyright and patenting policies, data sharing policies, and confidentiality rules in conducting research (Akaranga and Makau, 2016). As noted by Kothari, C.R (2004), people should be invited voluntarily to participate in research according to their understanding of the study area.

To make free and informed the respondents, it is mandatory to give full information regarding the purpose of the study and the researcher's state of position and responsibility. So, that respondent were Confident that the information provided by them is not to be disclosed and used exclusively for academic purposes. In addition, they are advised not to mention their preference in the questionnaire to lessen the baseness of the response.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

In this chapter, the data collected from the respondents for the purpose to study the effect of tariff barriers on the price determination of imported medical equipment depending on the proposed variables results presented, analysed and interpreted. The first part of the section deals with questionnaire, respondent rate and reliability of the research instrument. On the second part descriptive and inferential analysis of variables and the results are presented.

4.2 Questionnaire Respondent Rate

The researcher selected total 196 respondents and distributed to different selected department proportional. Based on this the actual usable data returned 191 respondents questionnaire. Thus, more than 97 % questionnaires are returned and used for this research.

4.3 Reliability

The reliability refers to a measurement that supplies consistent results with equal values (Blumberg et al., 2005). In the reliability test, Cronbach's alpha was used to measure internal consistency of items in the research instruments. According to the Cronbach's alpha rule of thumb results, if $\alpha \geq 0.9$ it means excellent correlate, if $0.9 > \alpha \geq 0.8$ good internal consistency, if $0.8 > \alpha \geq 0.7$ is acceptable, $0.7 > \alpha \geq 0.6$ questionable, $0.6 > \alpha \geq 0.5$ indicate the poor (low reliability). The reliability statistics indicate a high level of internal consistency among the items in the survey, with a Cronbach's alpha coefficient of .959. This suggests that the items in the survey, which assess respondents' perceptions and experiences related to FinTech services and customer satisfaction, are highly reliable and measure a common underlying construct. The high alpha coefficient indicates that the items are strongly correlated with each other, demonstrating that they are consistently measuring the same concept. With six items included in the analysis, the survey demonstrates a robust level of reliability. This reliability coefficient provides confidence in the consistency and accuracy of the survey instrument in capturing the intended construct of interest. Researchers and practitioners can rely on the findings derived from this survey to make informed decisions and draw meaningful conclusions based on the respondents' perceptions and experiences regarding FinTech services and their impact on customer satisfaction.

4.4 Demographic of the Respondents

This section presents the respondents' background information in terms of their Company representative, Age, education level, years of experience in the BoA, and current work position.

TABLE 4: 2 GENDER

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	105	55.0	55.0	55.0
	Female	86	45.0	45.0	100.0
	Total	191	100.0	100.0	

Source: Survey data (2024)

From the data presented in the table 4.2 the majorities 55% of the respondents were male and the remaining 45% of the respondents were female. This specified that out of 191 respondents around 105 were male and the remaining 86 where female. This indicates that the company workforce predominantly comprised of male employees.

TABLE 4: 3 AGE

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-28	29	15.2	15.2	15.2
	29-39	101	52.9	52.9	68.1
	40-50	59	30.9	30.9	99.0
	Over 50	2	1.0	1.0	100.0
	Total	191	100.0	100.0	

Source: Survey data (2024)

According to table 4.3, the largest age group among the respondents, with a precise percentage of 52.9%, was between 29 and 39 years old. Subsequently, the age group of 40-50 years accounted for 30.9% of the participants. The remaining 15.2% emanated from the age group of 18-28. The least percentage, which is 1%, was captured by respondents aged 50 and above. Consequently, the researcher inferred that the workforce of BoA comprises mainly middle age group employees.

TABLE 4: 4 EDUCATIONS

		Education			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	High School	10	5.2	5.2	5.2
	Diploma	17	8.9	8.9	14.1
	Bachelors Degree	119	62.3	62.3	76.4
	Masters Degree	44	23.0	23.0	99.5
	PhD or Higher	1	.5	.5	100.0
	Total	191	100.0	100.0	

In terms of the participants' educational attainment, the majority of respondents, amounting to 62.3%, held a Bachelor's degree. Meanwhile, those who possessed a Postgraduate degree above and individuals who held a certificate or diploma comprised 23.5% and 14% of the respondents, respectively. Evidently, this suggests that the respondents are learned and comprehended the purpose of the study, thus providing dependable and accurate responses to the questionnaire.

TABLE 4: 5 WORK EXPERIENCE

		Work Experience			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Less than 1 Year	9	4.7	4.7	4.7
	1-5 Years	89	46.6	46.6	51.3
	6-10 Years	91	47.6	47.6	99.0
	More than 10 Years	2	1.0	1.0	100.0
	Total	191	100.0	100.0	

Source: Survey data (2024)

Considering the number of services is or experience, the respondents were asked to state the length of their years of service. Accordingly, the highest share 47.6% of respondents indicate that they had a working experience of 6-10 years. While, 46.6%, 4.7%, and 1% of them had 1-5 years' experience, ≤ 1 Years' experience and >5 years of experience. Therefore, this result indicates that most of the respondents had a knowledge basis of the study area. Likewise, they were well experienced and have knowledge to evaluate the adoption of FinTech.

4.5 Descriptive Data Analysis

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data (Conjointly, 2022). The mean statistical value approaching were based on the following assumptions: if the mean value is between (1-1.8) this implies the respondents strongly disagreed, if the mean value is between (1.81-2.6) it indicates the respondents disagreed, the mean value between (2.61-3.4) indicates the respondents were neutral, the mean value between (3.41-4.20) implies the respondents agreed and a mean value 4.21 and above shows the respondents strongly agreed (Burns, 2008).

The standard deviation is a statistic that measures the dispersion of a dataset relative to its mean and is calculated as the square root of the variance. As a rule of thumb, a $SD \geq 1$ indicates a relatively high variation, while a $SD < 1$ can be considered low. This means that distributions with a coefficient of variation higher than 1 are considered to be high variance whereas those with a SD lower than 1 are considered to be low-variance.

4.5.1 Relative Advantage

Relative Advantage: the degree to which an innovation is perceived as being better than the idea it supersedes.

TABLE 4: 6: RELATIVE ADVANTAGE

Descriptive Statistics			
	N	Mean	Std. Deviation
FinTech offers greater convenience compared to traditional financial services.	191	3.85	1.291
FinTech provides better access to financial services.	191	3.49	1.151
FinTech enables faster and more efficient financial transactions.	191	3.80	1.316
FinTech offers better financial security and fraud protection	191	3.39	1.045
The adoption of FinTech practices by Bank of Abyssinya has positively impacted my financial decision-making process	191	3.50	1.030
Valid N (listwise)	191		

Source: Survey data (2024)

As shown in the above table 4:6 presents the descriptive statistics of respondents' perceptions regarding various aspects of FinTech services. Overall, the findings indicate that respondents perceive FinTech to offer greater convenience compared to traditional financial services, with

a mean score of 3.85. Similarly, respondents believe that FinTech provides better access to financial services, although to a slightly lesser extent, with a mean score of 3.49. Additionally, respondents perceive FinTech to enable faster and more efficient financial transactions, with a mean score of 3.80. However, when it comes to financial security and fraud protection, respondents express a relatively moderate level of agreement, with a mean score of 3.39. This suggests that while FinTech is seen as convenient and efficient, there may be some concerns or reservations regarding its security aspects. In terms of the impact of FinTech practices adopted by Bank of Abyssinya on financial decision-making, respondents express a moderate level of agreement, with a mean score of 3.50. Overall, the data suggests that respondents generally perceive FinTech services positively, highlighting their convenience, accessibility, and efficiency, although there may be some reservations regarding financial security.

4.5.2 Complexity

TABLE 4: 7 COMPLEXITY

Descriptive Statistics			
	N	Mean	Std. Deviation
FinTech aligns well with my financial needs and goals.	191	4.00	1.361
FinTech is compatible with my lifestyle and technological preferences.	191	3.77	1.394
FinTech complements the services offered by traditional financial institutions	191	3.68	1.021
FinTech services at Bank of Abyssinya have provided me with more personalized and tailored financial solutions.	191	3.88	1.270
FinTech services have allowed me to access innovative financial products and services provided by Bank of Abyssinya	191	3.20	1.250
The integration of FinTech solutions has reduced the need for me to visit physical bank branches	191	3.70	1.447
Valid N (listwise)	191		

Concerning with the variables of complexity, similar with the above variables, the study found that only the question of FinTech services have allowed me to access innovative financial products and services provided by Bank of Abyssinya. But, all other question items are found agreed. It indicates that the respondents are approaches to agreement concerning with complexity.

4.5.3 Compatibility

Compatibility; the degree to which an innovation is perceived as consistent with the values and needs of potential adopters.

TABLE 4: 8 COMPATIBILITY

Descriptive Statistics			
	N	Mean	Std. Deviation
FinTech is easy to understand and use.	191	2.91	1.261
The interface and features of FinTech platforms are user-friendly.	191	3.35	1.225
Learning to use FinTech does not require significant effort or time.	191	3.04	1.360
Understanding and navigating the FinTech solutions provided by Bank of Abyssinya requires a low level of technical knowledge	191	2.71	1.137
FinTech practices at Bank of Abyssinya has decreased the learning curve for using their digital platforms	191	2.61	1.099
Valid N (listwise)	191		

Source: Survey data (2024)

As the standard that mentioned in the above if the mean values found between from 2.61-3.4 neutral. Thus, all the respondents are respondents are not agree or disagree. The mean values of the items indicated in the table ranges between 2.61 to 3.35. This indicates that respondents disagree with the positively presented questions regarding the easiness of the system for adoption. This is also shown in the standards deviation that ranges from 1.099 to 1.36 which is higher variation in the responses of respondents. Thus, concerning with compatibility the respondents did not have detail knowledge.

4.5.4 Triability

The accelerated rate of rapid adoption after a successful trial is based on Trialability: the capacity of the consumer to give the innovation a try or test before deciding to adopt it or not.

TABLE 4: 9: TRIABILITY**Descriptive Statistics**

	N	Mean	Std. Deviation
I have had the opportunity to try out FinTech platforms or services.	191	3.77	1.349
FinTech providers offer trial periods to potential users	191	3.32	1.055
FinTech providers offer demonstrations to potential users	191	3.69	1.347
Bank of Abyssinya offers easy-to-use trial versions or demos of their FinTech solutions for staffs to test before making a commitment	191	3.42	1.042
The availability of free trials or limited-time offers allows staffs to explore the benefits and features of Bank of Abyssinya's FinTech practices	191	3.43	1.069
Bank of Abyssinya provides clear instructions and guidance on how to trial their FinTech services effectively	191	3.51	.967
Bank of Abyssinya offers incentives or rewards for staffs who try out and provide feedback on their FinTech solutions	191	3.31	.891
The process of trialing FinTech practices at Bank of Abyssinya is hassle-free and convenient	191	2.66	1.068
Valid N (listwise)	191		

Source: Survey data (2024)

As shown in the above table majority of the questions response approaches to neutral. As the above compatibility variables majority of those questions mean values failed at the range of 2.61-3.4 mean values. However, three questions, “I have had the opportunity to try out FinTech platforms or services.”, “FinTech providers offer demonstrations to potential users”, “The availability of free trials or limited-time offers allows staffs to explore the benefits and features of Bank of Abyssinya's FinTech practices” and “Bank of Abyssinya offers easy-to-use trial versions or demos of their FinTech solutions for staffs to test before making a commitment”. Agreed that practiced in BoA.

4.5.5 Observability

Observability: the degree to which the results of an innovation are visible to the adaptors- and others as well.

TABLE 4: 10 OBSERVABILITY**Descriptive Statistics**

	N	Mean	Std. Deviation
I have observed others using FinTech services and benefiting from them.	191	3.90	1.316
FinTech success stories and positive user experiences are widely shared and discussed.	191	3.79	1.357
I am Observed about the security and privacy risks associated with FinTech.	191	3.66	1.023
I am not worry about potential financial losses or scams when using FinTech platforms.	191	3.87	1.267
The benefits of using FinTech practices at Bank of Abyssinya are clearly visible and tangible to me as a customer	191	3.25	1.201
I can easily observe the positive impact of FinTech practices on my financial transactions and experiences with Bank of Abyssinya	191	3.71	1.309
Bank of Abyssinya provides real-time updates and notifications that make the benefits of FinTech practices evident to me	191	3.37	1.184
Valid N (listwise)	191		

Source: Survey data (2024)

The data presents the descriptive statistics of respondents' perceptions and experiences regarding FinTech services and their impact on customer satisfaction. Overall, the findings suggest that the majority of participants have observed others benefiting from FinTech services (mean = 3.90) and believe that positive user experiences are widely shared and discussed (mean = 3.79). However, there is some variation in responses, indicating that not everyone has the same level of agreement or awareness. Concerns about security and privacy risks associated with FinTech are moderate (mean = 3.66), indicating that individuals are conscious of the potential risks. On the other hand, respondents generally express a lack of worry about potential financial losses or scams when using FinTech platforms (mean = 3.87), although there is some variation in the degree of concern. Perceptions of the benefits of FinTech practices at Bank of Abyssinya are somewhat moderate (mean = 3.25), suggesting that customers see some tangible advantages, but responses vary. Respondents generally believe they can easily observe the positive impact of FinTech practices on their financial transactions and experiences with Bank of Abyssinya (mean = 3.71), with some variability in responses. The provision of real-time updates and notifications by Bank of Abyssinya to make the benefits of FinTech practices evident is moderately perceived by respondents (mean = 3.37), with some variation in their opinions. In summary, while respondents generally acknowledge the benefits of FinTech and observe positive outcomes, there are still concerns about security and privacy risks, as well as varying levels of perception regarding the benefits of FinTech practices at Bank of Abyssinya.

4.6 Inferential statistics Analysis

Multiple regression analysis was used to determine the relationship between Adoption of FinTech and the five independent variables for the case of BoA. The regression model was adopted for the study is:

4.6.1. Correlation Analysis

Pearson correlation was used to measure the degree of association between variables under consideration i.e. independent variables and the dependent variables. Pearson correlation coefficients range from -1 to +1. A negative value indicates negative correlation and positive values indicates positive correlation. Rule of thumb for interpreting the size (strength) of a Pearson correlation coefficient (Parvez, 2016).

- .90 to 1.00 (-.90 to -1.00) Very strong high positive (negative) correlation
- .70 to .90 (-.70 to -.90) Strong positive (negative) correlation
- .50 to .70 (-.50 to -.70) Moderately strong positive (negative) correlation
- .30 to .50 (-.30 to -.50) weak positive (negative) correlation
- .00 to .30 (0.00 to -.30) negligible correlation

TABLE 4: 11: CORRELATION

		Correlations					
		Relative Advantage	Compatibility	Complexity	Trialbility	Observability	Adoption of FinTech
Relative Advantage	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	191					
Compatibility	Pearson Correlation	.643**	1				
	Sig. (2-tailed)	.000					
	N	191	191				
Complexity	Pearson Correlation	.589**	.667**	1			
	Sig. (2-tailed)	.000	.000				
	N	191	191	191			
Trialbility	Pearson Correlation	.637**	.616**	.756**	1		
	Sig. (2-tailed)	.000	.000	.000			

	N	191	191	191	191		
Observability	Pearson	.681**	.612**	.628**	.699**	1	
	Correlation						
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	191	191	191	191	191	
Adoption of FinTech	Pearson	.676**	.635**	.619**	.675**	.901**	1
	Correlation						
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	191	191	191	191	191	191

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Survey data (2024)

Relative Advantage and Adoption of FinTech: There is a strong positive correlation of 0.876** (significant at the 0.01 level) between Relative Advantage and Adoption of FinTech. This suggests that as the perceived relative advantage of using FinTech increases, the adoption of FinTech also tends to increase.

Compatibility and Adoption of FinTech: There is a strong positive correlation of 0.835** between Compatibility and Adoption of FinTech. This indicates that higher levels of compatibility between individuals or businesses and FinTech solutions are associated with a higher likelihood of adopting FinTech. **Complexity and Adoption of FinTech:** There is a moderately strong positive correlation of 0.619** between Complexity and Adoption of FinTech. This suggests that as the perceived complexity of using FinTech increases, the adoption of FinTech also tends to increase, although to a lesser extent compared to Relative Advantage and Compatibility.

Trialability and Adoption of FinTech: There is a strong positive correlation of 0.875** between Trialability and Adoption of FinTech. This indicates that when individuals or businesses have the opportunity to try out or test FinTech solutions, they are more likely to adopt them. **Observability and Adoption of FinTech:** There is a strong positive correlation of 0.901** between Observability and Adoption of FinTech. This suggests that as the visibility or observability of successful FinTech adoption increases, the likelihood of adopting FinTech also increases.

Overall, the correlation results indicate that all the independent variables (Relative Advantage, Compatibility, Complexity, Trialability, and Observability) are significantly and positively correlated with the dependent variable (Adoption of FinTech). These findings

suggest that all of these factors play a role in influencing the adoption of FinTech. This value has shown that there is a very strong positive correlation between the variables. It means that with the increase in the Adoption of FINTECH provided it will result in increase in the level of determinant variables among the staffs. These results are also consistent with the one studied on Nigerian population by Olatokun and Gbinedion (2009), El-Haddan and Almahmeed (1992) studied a Kuwaiti population, and Marshall and Heslop (1988) studied a Canadian population. Hence, the above attributes have strong relationships with staffs' adoption for the use of Fintechs.

4.6.2. Regression Assumption Test

Before proceeding ahead, the researcher has checked whether multiple regression have met assumptions.

4.6.2.1 Multicollinearity test

Multicollinearity occurs when independent variables in a regression model are correlated. This correlation is a problem because independent variables should be independent. If the degree of correlation between variables is high enough, it can cause problems when you fit the model and interpret the results (Jim Frost, 2019).

A key goal of regression analysis is to isolate the relationship between each independent variable and the dependent variable. The interpretation of a regression coefficient is that it represents the mean change in the dependent variable for each 1 unit change in an independent variable when you hold all of the other independent variables constant (Jim Frost, 2019).

There are two a very simple test to assess multicollinearity in regression model. The variance inflation factor-VIF (which calculates the influence of correlation among the independent variables on the precision of regression estimates) and Tolerance (an indicator of how much of the variability of the specified independent variable is not explained by the other independent variable in the model) identifies correlation between independent variables and the strength of that correlation. If VIF not exceed 10 and if Tolerance greater than 0.1 it means that there is no multicollinearity problem within the model. The below table 4.12 Confirms the absence of multi-collinearity according to collinearity statistics

TABLE 4: 12: COLLINEARITY STATISTICS

Multicollinearity			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Relative Advantage	.211	4.730
	Compatibility	.118	8.460
	Complexity	.414	2.418
	Trialability	.100	9.959
	Observability	.113	8.851

a. Dependent Variable: Adoption of FinTech

Source: Survey data (2024)

The Collinearity statistics table provides information about the presence of Multicollinearity in the regression model. Multicollinearity occurs when two or more independent variables in the model are highly correlated with each other, which can impact the model's reliability and interpretability.

The tolerance values and variance inflation factor (VIF) are commonly used measures to assess multicollinearity. Tolerance is the reciprocal of the VIF and indicates the proportion of the variance in an independent variable that is not explained by the other independent variables. A tolerance value close to 1 suggests low multicollinearity, while a value close to 0 indicates high multicollinearity. VIF values greater than 1 indicate the presence of multicollinearity, with higher values indicating stronger correlations. Analysing the collinearity statistics table, we can observe that the independent variables, namely Relative Advantage, Compatibility, Complexity, Trialability, and Observability, have varying levels of multicollinearity:

Relative Advantage: It has a tolerance value of 0.211 and a VIF of 4.730. Although the VIF is above 1, the tolerance is moderately high, indicating some correlation but not severe multicollinearity.

Compatibility: It has a tolerance value of 0.118 and a VIF of 8.460. The VIF suggests a high level of multicollinearity, indicating a strong correlation with other independent variables.

Complexity: It has a tolerance value of 0.414 and a VIF of 2.418. Both the tolerance and VIF values suggest that there is a moderate level of multicollinearity.

Trialability: It has a tolerance value of 0.100 and a VIF of 9.959. The high VIF indicates significant multicollinearity, while the low tolerance suggests that a large portion of the variance in Trialability is explained by other independent variables.

Observability: It has a tolerance value of 0.113 and a VIF of 8.851. Similar to Compatibility and Observability, there is a high level of multicollinearity indicated by the VIF, and the tolerance is relatively low.

The presence of multicollinearity can complicate the interpretation of regression coefficients and reduce the model's stability. In this case, it is important to carefully consider the impact of multicollinearity on the regression results and potentially explore strategies to mitigate its effects, such as removing or transforming variables, or using regularization techniques like ridge regression or lasso regression.

4.6.2.2 Linearity Assumption

Linearity refers to the degree to which the change in the dependent variable is related to the change in the independent variables (Balance, 2004). Linearity assumption was tested by producing Normal Probability Plots of the relationship between each of independent variable and the dependent variable of the organization. In a normal probability plot of the regression, standardized results lie in a regularly straight diagonal line from bottom left to top right in the figure 4.1 below:

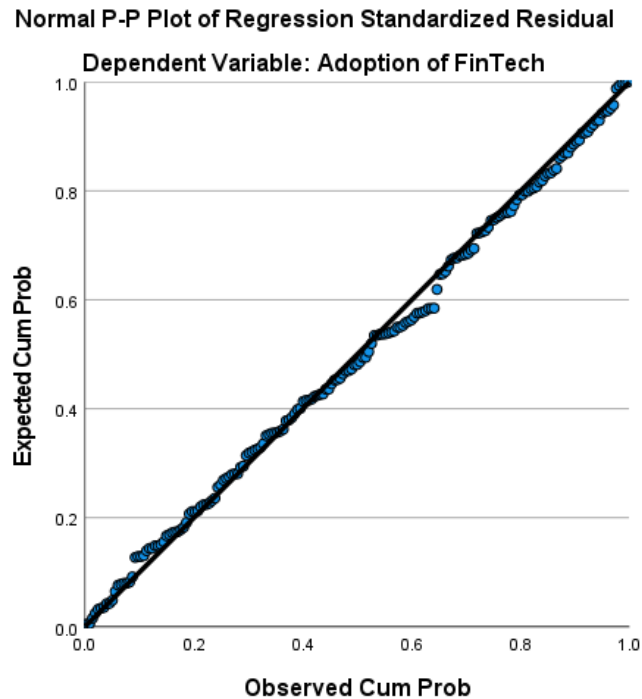


FIGURE 4: 1 NORMAL PROBABILITY PLOT

Source: Survey data (2024)

By visually looking at the Normal Probability plot produced by SPSS, it could be concluded that the relationship between each independent variable and the dependent variable is found to be linear as shown in figure above.

4.6.2.3 Normality Assumption:

Normality is used to describe a symmetrical, bell-shaped curve, which has the greatest frequency of scores in the middle combined with smaller frequencies towards the extremes. A multiple regression assumes that variables have normal distributions. This means that errors are normally distributed and the values of the residuals will approximate a normal curve. The common method to check normality assumption is a histogram (with a superimposed normal curve).

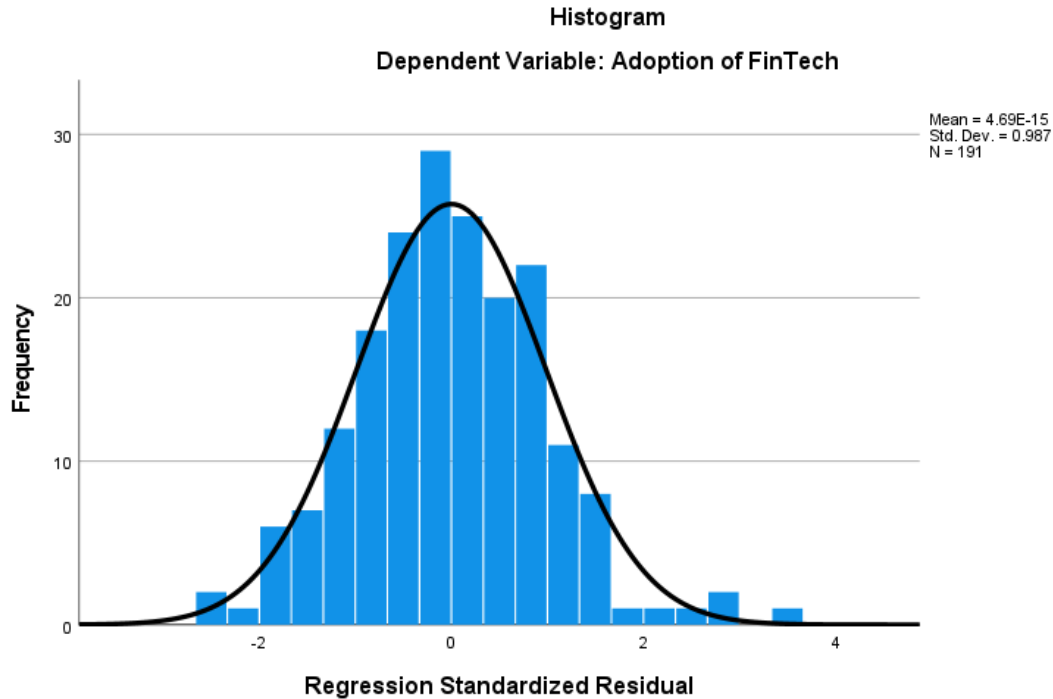


FIGURE 4: 2 HISTOGRAM

Source: Survey data (2024)

As it can be observed in the above figure 4:2 it indicates that the requirement is satisfied and there is no major deviation from normality. In simple words normality test for the data used in this study shown by the above histogram indicates that error terms are normally distributed. Therefore, it can be concluded that normality is guaranteed as the histogram generated is normally distributed.

4.6.2.4 Autocorrelation Assumption:

Autocorrelation analysis measures the relationship of the observations between the different points in time, and thus seeks for a pattern or trend over the time series. It is the degree of correlation of the same variables between two successive time intervals (Georgiou, 2019). But classical linear regression model assumes that, there is no serial correlation among error terms. Durbin Watson (DW) test is the common techniques of detecting autocorrelation. The residuals are not correlated if the Durbin-Watson statistic is approximately 2, and found between acceptable ranges of 1.50 - 2.50.

TABLE 4: 13: DURBIN WATSON TEST

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.927 ^a	.860	.856	.41744	.704

a. Predictors: (Constant), Observability, Complexity, Relative Advantage, Compatibility, Trialability

b. Dependent Variable: Adoption of FinTech

Source: Survey data (2024)

The Durbin-Watson statistic of 0.704 measures the presence of autocorrelation in the model's residuals. The value ranges from 0 to 4, with 2 indicating no autocorrelation. In this case, the value of 0.704 suggests the possibility of positive autocorrelation, indicating that there might be some pattern or relationship between the residuals. Further investigation or diagnostic tests may be required to assess and address this issue. Overall, based on the model summary, it can be concluded that the regression model provides a good fit to the data, with high explanatory power and accurate predictions. However, the presence of possible autocorrelation should be taken into consideration and addressed if necessary.

4.6.3. Multiple Regression Analysis

Regression analysis is a statistical method used to determine the relationship between a dependent variable and one or more independent variables. It can be used to assess the strength of the relationship, model the future relationship, and forecast the future values of the dependent variable.

In a regression analysis, the dependent variable is also known as the response variable, while the independent variable is also known as the predictor variable. The goal of regression analysis is to find the best-fit line that describes the relationship between the dependent variable and the independent variable(s).

4.6.3.1 Model Summary

A model summary in research is a brief description of the statistical model used to analyze the data. It typically includes information about the variables included in the model, the statistical tests used to assess the significance of the variables, and the goodness-of-fit of the model.

The model summary is an important part of any research study because it provides readers with a clear understanding of the statistical methods used to analyze the data and the results of those analyses.

TABLE 4: 14: MODEL SUMMARY

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927 ^a	.860	.856	.41744

a. Predictors: (Constant), Observability, Complexity, Relative Advantage, Compatibility, Triability

b. Dependent Variable: Adoption of FinTech

Source: Survey data (2024)

Model summary (table 2) of output is very important in describing overall relationships between dependent and independent variables (R), goodness of fit (R square) and the standard error of estimate. In order to determine the strength of relationship between those variables, a value of R which is assumed to be 0.927 was established to show that the relationship between dependent and independent variable is very strong.

Similarly, R^2 value shows us how close the data are to the fitted regression line. Thus, the overall predictability of the model is shown in the above table. The R^2 value of 0.860 indicates that model explains 86 % of the attributes are responsible for overall staff adoption of FINTECH. This implies that the model captures a substantial portion of the variability in the dependent variable, suggesting a strong relationship between the predictors and the adoption of FinTech.

The adjusted R-square value of 0.856 takes into account the number of predictors and adjusts the R-square value accordingly. It provides a slightly more conservative estimate of the model's explanatory power, considering the degrees of freedom. In this case, the adjusted R-square value remains high, indicating that the model is robust and not over-fitting the data. Moreover, this model shows a figure of standard error of estimate i.e. 0.417, meaning that actual data is 41.7% dispersed from the regression line. The results in model summary table indicates that 85.6% variations on the dependent variable are caused by independent variable. This implies that one unit change in the explanatory variables considered in the study (relative advantage, complexity, compatibility, observability and triability) results 0.86 unit change in the adoption of FineTech in the study bank.

4.6.3.2 ANOVA

Analysis of Variance (ANOVA) is a statistical method used to test differences between two or more means. It is similar to the t-test, but the t-test is generally used for comparing two means, while ANOVA is used when you have more than two means to compare. ANOVA is based on comparing the variance (or variation) between the data samples to the variation within each particular sample. If the between-group variance is high and the within-group variance is low, this provides evidence that the means of the groups are significantly different.

ANOVA is typically used in experimental research to determine whether there are any statistically significant differences between the means of different groups. It is also used in regression analysis to test the significance of the regression coefficients.

TABLE 4: 15: ANOVA

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	197.564	5	39.513	226.747	.000 ^b
	Residual	32.238	185	.174		
	Total	229.802	190			

a. Dependent Variable: Adoption of FinTech

b. Predictors: (Constant), Observability, Complexity, Relative Advantage, Compatibility, Trialability

Source: Survey data (2024)

The analysis of variance (ANOVA) table indicates that the regression model used to examine the factors influencing the adoption of FinTech in the given data is highly significant. The regression model accounts for a substantial portion of the total variation in the data, as evidenced by the large F-value of 226.747 (with 5 and 185 degrees of freedom for the numerator and denominator, respectively) and a p-value of .000.

The regression model's ability to explain the variance is further supported by the sum of squares values. The sum of squares for the regression, which represents the variability explained by the model, is 197.564. In contrast, the sum of squares for the residual, which represents the unexplained variability in the data, is 32.238. The total sum of squares, which represents the total variability in the data, is 229.802.

4.6.3.3 Regression coefficients

A regression coefficient is a measure of the strength and direction of the relationship between the independent variable(s) and the dependent variable. It represents the change in the dependent variable for a one-unit change in the independent variable, holding all other variables constant.

TABLE 4: 16: COEFFICIENTS

		Coefficients ^a				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.722	.142		-5.076	.000
	Relative Advantage	.404	.073	.331	5.531	.000
	Compatibility	-.216	.084	-.205	-2.557	.011
	Complexity	-.028	.058	-.021	-.486	.628
	Trialbility	.523	.119	.384	4.414	.000
	Observability	.486	.086	.464	5.665	.000

a. Dependent Variable: Adoption of FinTech

Source: Survey data (2024)

Testing the Hypothesis

The above table represents the coefficients of a regression model examining the adoption of FinTech. The model includes five independent variables: Relative Advantage, Compatibility, Complexity, Trialability, and Observability. The dependent variable is Adoption of FinTech. As depicted on the above model, four independent variables are useful to predict the adoption of FINTECH in the case of BOA.

Relative Advantage ($\beta = -0.722$, $P < 0.000$) was found to have a significant effect on the adoption of FINTECH. As a result of this, Hypothesis (H1) is **rejected**. As staffs responded, the advantages of using FINTECHs have made them prefer to FinTechs than the traditional transactions/bank tellers with considered save time, accuracy and reduced costs. The significant contribution of Relative Advantage to the adoption technology is consistent with previous research involving information system acceptance (Horton et al., 2001).

Regarding with the Complexity variable shows ($\beta = -0.028$, $p > 0.05$) was insignificant relations to the adoption of FINTECH. Therefore, Hypothesis (H3) is **accepted**. It indicating that their relationships with Adoption of FinTech are not statistically significant. Findings from this study suggested that FINTECHs were easy to use and more likely to be more

widely adopted. However, it contributed less than Relative Advantage and Compatibility to the above model. The significant contribution of Complexity to the adoption model has already been earmarked by various scholars like Kolodinsky et al. (2004) and Chen et al. (2002).

Compatibility, on the other hand, has a negative effect on Adoption of FinTech. The coefficient for Compatibility is -0.216, with a standard error of 0.084. The standardized coefficient (Beta) of -0.205 indicates that for each standard deviation increase in Compatibility, the Adoption of FinTech is expected to decrease by 0.205 units. The t-value of -2.557 and the p-value of 0.011 suggest that this relationship is statistically significant. As a result of this, Hypothesis (H3) is **rejected**. This finding is also consistent with the result found by Friday and Mary (2013). Similarly, McKenzie, 2001; Sherry, 1997) observe that a lack of Compatibility in IT with individual needs may negatively affect the individual's use of the innovation.

As per the above model indicates, Observability shows a significant positive effect on Adoption of FinTech. The coefficient for Observability is 0.486, with a standard error of 0.086. The standardized coefficient (Beta) of 0.464 suggests that for each standard deviation increase in Observability, the Adoption of FinTech is expected to increase by 0.464 units. The t-value of 5.665 and the p-value of 0.000 indicate that this relationship is statistically significant. As a result of this Hypothesis (H4) is **rejected**. As the finding of the study, FINTECH is usually found in public places and less queue while using FINTECH. However, comparing with the other four variables it has less effect to adopt FINTECH in BoA's staffs.

The last variables in this model, Trialability ($\beta = 0.523$, $p < 0.00$) was found that significant relationships to the effect on FINTECH adoption in BoA's staffs. As a result of this, Hypothesis (H5) is **rejected**. The results of this study implied that the respondents have attempted to try FINTECHs before adopting its use. Hence, a customer who can use FINTECH at one place can operate FINTECH on another place. Therefore it can suggest that potential adopters of FinTech may well benefit from trial demonstrations as an introduction to using the technology. However, the significance contribution of Trialability to the adoption model was inconsistent with the finding of Friday and Mary (2013).

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

Based on the regression model, the adoption of FinTech in the case of Bank of Abyssinia (BOA) is influenced by several factors. The results indicate that four out of the five independent variables have a significant effect on the adoption of FinTech. Concerning relative advantage, the coefficient suggests that the perceived advantages of using FinTech compared to traditional transactions/bank tellers significantly influence the adoption of FinTech. These advantages include saving time, increased accuracy, and reduced costs. This finding aligns with previous research on information system acceptance. The complexity variable was found to be statistically insignificant in its relationship with the adoption of FinTech. This implies that the ease of use of FinTech and its widespread adoption outweigh the potential complexity associated with it. However, its contribution to the adoption model is less significant compared to other variables. Compatibility has a negative effect on the adoption of FinTech. This means that when FinTech is not compatible with individual needs, it is less likely to be adopted. Lack of compatibility with individual requirements can hinder the use of innovative technologies, according to previous studies. Observability has a significant positive effect on the adoption of FinTech. The visibility of FinTech in public places with shorter queues contributes to its adoption. However, compared to other variables, its influence on FinTech adoption in BOA staff is relatively modest. Trialability has a significant positive effect on the adoption of FinTech. This suggests that potential adopters of FinTech benefit from trial demonstrations and previous experience with using the technology. The ability to try FinTech in one place and apply it in another enhances its adoption.

In conclusion, the factors that significantly influence the adoption of FinTech in the case of BOA are relative advantage, compatibility, observability, and trialability. These findings support the importance of emphasizing the advantages of FinTech over traditional methods, ensuring compatibility with individual needs, enhancing observability in public spaces, and providing opportunities for trial demonstrations to facilitate adoption. However, complexity does not significantly impact the adoption of FinTech in this context.

5.2 Recommendations

Based on the findings and the conclusions drawn in the previous sections, the following recommendations are forwarded.

1. Conduct thorough research to understand the FinTech solutions available in the market. Look for reputable providers with a track record of success and positive customer reviews. Consider factors such as functionality, scalability, security, and integration capabilities.
2. Develop a well-defined roadmap that outlines your FinTech adoption strategy. Identify goals, milestones, and timelines for implementation. Ensure that the roadmap aligns with your organization's overall business objectives.
3. Prioritize data security and regulatory compliance when selecting and implementing FinTech solutions. Verify that the solutions adhere to industry standards and comply with relevant regulations.
4. Evaluate how well the FinTech solutions can integrate with your existing infrastructure and systems. Smooth integration is essential to avoid disruptions in operations and ensure a seamless flow of data.
5. Provide comprehensive training to employees who will be using the FinTech solutions. Ensure they understand the benefits, functionalities, and proper usage of the tools. Encourage ongoing learning to keep up with updates and new features.

Based on the regression model results, the researcher would recommend the following actions to promote the adoption of FinTech at Bank of Abyssinia (BOA):

- ✓ Highlight the Relative Advantages: Emphasize the benefits of using FinTech compared to traditional transactions and bank tellers. Promote the advantages of saving time, increased accuracy, and reduced costs. This messaging should be incorporated into marketing materials, training sessions, and customer communications.
- ✓ Enhance Compatibility: Ensure that FinTech offerings are compatible with individual needs and requirements. Conduct market research and collect user feedback to understand customers' preferences and pain points. Use this information to refine and customize the FinTech solutions to better meet their needs.

- ✓ **Increase Observability:** Improve the visibility of FinTech in public spaces, such as bank branches and other customer touchpoints. Make sure customers can see and experience the benefits of using FinTech through shorter queues, faster transactions, and improved service. Consider implementing visible displays or interactive demos that showcase the advantages of FinTech.
- ✓ **Facilitate Trialability:** Provide opportunities for potential adopters to try out FinTech through trial demonstrations and pilot programs. Offer incentives for customers to test and experience the technology firsthand, allowing them to understand its benefits and become more comfortable with its usage. Use feedback from these trial experiences to address any concerns and make necessary improvements.
- ✓ **Simplify Complexity:** While complexity was found to be statistically insignificant in its relationship with FinTech adoption, it is still important to ensure that FinTech solutions are user-friendly and intuitive. Continuously work on simplifying the user experience and providing clear instructions and support to minimize any perceived complexity associated with FinTech.

By implementing these recommendations, Bank of Abyssinia can further promote the adoption of FinTech among its customers and staff, ultimately enhancing efficiency, customer satisfaction, and the overall digital banking experience.

REFERENCES

- Abor, J.,(2004). Technological innovations and banking in Ghana: An evaluation of staffs' perceptions. *Abyssinian Academy of Financial Management*, 1, 1-16, 2004.
- Amabile, M., Regina C., Heather C., Jeffrey L. and Michael H. 1996. Assessing the work environment for creativity. *Academy of Management Journal* 39: 1154–84.
- Amin, H. 2007. An analysis of mobile credit card usage intentions. *Information Management and Computer*
- Anderson, C., and David W. 1988. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin* 103: 411–23.
- Arifin, Z. 2015. The effect of dynamic capability to technology adoption and its determinant factors for improving firm's performance; toward a conceptual model. *Procedia-Social and Behavioral Sciences* 207: 786–96.
- Avolio, J., and William L. 2005. Authentic leadership development: Getting to the root of positive forms of leadership. *The Leadership Quarterly* 16: 315–38
- Aziz, F. Md R., Fazilah R., and Nomahaza M. 2020. The influence of leadership style towards technology acceptance in organization. *International Journal of Advanced Science and Technology* 29: 218–25.
- Baabdullah, A., O. Nasseef, and A. Alalwan. 2016. Consumer adoption of mobile government in the Kingdom of Saudi Arabia: The role of usefulness, ease of use, perceived risk and innovativeness. Paper presented at Conference on e-Business, e-Services and e-Society, Swansea, UK, September 13–15. Cham: Springer, pp. 267–79.
- Bach, M. 2014. Exploring information and communications technology adoption in enterprises and its impact on innovation performance of European countries. *Ekonomický časopis* 62: 335–62.
- El-Haddad, A., and Almahmeed, M., (1992).FINTECH Banking Behaviour in Kuwait: A Consumer Survey. *International Journal of Bank Marketing*, Vol. 10 Issue: 3, pp.25-32
- Friday, D., and Mary, O., (2013). Adoption of automated teller machine in Nigerian banks: use enhancements and limitations. *International Journal of Computer Science and Mobile Computing*.Vol. 2, Issue. 8, August 2013, pg.14 – 23

- Horton, R. P., Buck, T., Waterson, P. E., & Clegg, C. W. (2001). Explaining intranet use with the technology acceptance model. *Journal of Information Technology*, 16(4), 237-249.
- Jamal, A., and Naser, K., (2002). Customer satisfaction and retail banking: an assessment of some of the key antecedents of customer satisfaction in retail banking. *International Journal of Bank Marketing* 20 (4) , pp. 146-160
- Judith J. Marshall, Louise A. Heslop, (1988) "Technology Acceptance in Canadian Retail Banking: A Study of Consumer Motivations and Use of FINTECHs", *International Journal of Bank Marketing*, Vol. 6 Issue: 4, pp.31-41
- Kolodinsky, J. M., Hogarth, J. M., and Hilgert, M. (2004). "The Adoption of Electronic Banking Technologies by US Consumers," *The International Journal of Bank Marketing* 22 :(4), pp. 238- 259.
- McKenzie, J. (2001). How teacher learn technology best. *From Now On: The Educational Technology Journal*, 10(6).
- Olatokun and gbinedion (2009), *The Adoption of Automatic Teller Machines in Nigeria: An Application of the Theory of Diffusion of Innovation. Issues in Informing Science and Information Technology Volume 6, 2009*
- Rogers, Everett M. (1983) *Diffusion of Innovations*. Third Edition, Free Press, New York.
- Sherry, L. (1997). The boulder valley internet project: Lessons learned. *THE Technological Horizons in Education Journal*, 25(2), 68-73.
- Terzis, V. and Anastasios A. 2011. The acceptance and use of computer based assessment. *Computers and Education* 56: 1032–44.
- VanWart, M, Alexandru R., XiaohuW. and Cheol L. 2017. Integrating ICT adoption issues into (e-) leadership theory. *Telematics and Informatics* 34: 527–37.
- Veeramootoo, N., Robin N., and Yogesh K. D. 2018. What determines success of an e-government service? Validation of an integrative model of e-filing continuance usage. *Government Information Quarterly* 35: 161–74.
- Venkatesh, V., and Fred D. 1996. A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences* 27: 451–81.
- Yang, S., Yaobin L., Sumeet G., Yuzhi C. and Rui. 2012. Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behavior* 28: 129–42.
- Zafiroopoulos, K., Ioannis K., and Vasiliki V. 2012. Accessing the adoption of e-government services by teachers in Greece. *Future Internet* 4: 528–44.

Annex
RESEARCH QUESTIONNAIRE
ST. MARRY UNIVERSITY
SCHOOL OF POSTGRADUATE STUDIES
BUSINESS ADMINISTRATION PROGRAM

Questionnaire to be filled by Employees of Bank of Abyssinia.

Dear Respondent:

I am MBA postgraduate student at St. Marry University. This questionnaire is designed to collect relevant data for the research carried out on the topic **“The Adoption of FinTech in Ethiopian Financial Institutions: The Case of Bank of Abyssinia in Addis Ababa”** The study is conducted for the academic purpose that is for partial fulfillment of the requirements of the Master of business administration. Hence, your responses will be kept confidential.

The soundness and validity of findings highly depend on your honest and thoughtful responses. Therefore, I kindly request you to fill out the questionnaire carefully and return it at your earliest convenience.

Thank you in advance for your kind cooperation!

Salem

General Instruction:

There is no need of writing your name

Please put right mark (√) inside the box to express your choice.

Part I: Personal Information

SN	Questions	Response
1	Gender	1. Male <input type="checkbox"/> 2. Female <input type="checkbox"/>
2	Age	1. 18-25 years <input type="checkbox"/> 2. 26-35 Years <input type="checkbox"/> 3. 36-46 Years <input type="checkbox"/> 4. 46-55 Years <input type="checkbox"/> 5. 55 and above <input type="checkbox"/>
3	Educational status	1. Certificate/diploma <input type="checkbox"/> 2. Bachelor degree <input type="checkbox"/> 3. Post graduate and above <input type="checkbox"/>
4	working experience in the company (in year)	1. ≤ 1 <input type="checkbox"/> 2. 1 – 3 <input type="checkbox"/> 3. 3 – 5 <input type="checkbox"/> 4. Above 5 <input type="checkbox"/>

Part II: Questions related to the five determinants of Adoption of FinTech in BoA

Based on your experience in the Bank of Abyssinia staff, please feedback to what extent do you think the following factors listed under each Adoption of FinTech that are practiced in the company.

(5=Strongly Agree, 4= Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree)

No.	I. Relative Advantage	1	2	3	4	5
1	FinTech offers greater convenience compared to traditional financial services.					
2	FinTech provides better access to financial services.					
3	FinTech enables faster and more efficient financial transactions.					
4	FinTech offers better financial security and fraud protection					
5	The adoption of FinTech practices by Bank of Abyssinya has positively impacted my financial decision-making process					
	II. Compatibility					
1	FinTech aligns well with my financial needs and goals.					
2	FinTech is compatible with my lifestyle and technological preferences.					
3	FinTech complements the services offered by traditional financial institutions					
4	FinTech services at Bank of Abyssinya have provided me with more personalized and tailored financial solutions.					
5	FinTech services have allowed me to access innovative financial products and services provided by Bank of					

	Abyssinya					
6	The integration of FinTech solutions has reduced the need for me to visit physical bank branches					
III. Complexity						
1	FinTech is easy to understand and use.					
2	The interface and features of FinTech platforms are user-friendly.					
3	Learning to use FinTech does not require significant effort or time.					
4	Understanding and navigating the FinTech solutions provided by Bank of Abyssinya requires a low level of technical knowledge					
5	FinTech practices at Bank of Abyssinya has decreased the learning curve for using their digital platforms					
IV. Trialability						
1	I have had the opportunity to try out FinTech platforms or services.					
2	FinTech providers offer trial periods to potential users					
3	FinTech providers offer demonstrations to potential users					
4	Bank of Abyssinya offers easy-to-use trial versions or demos of their FinTech solutions for staffs to test before making a commitment					
5	The availability of free trials or limited-time offers allows staffs to explore the benefits and features of Bank of Abyssinya's FinTech practices					

6	Bank of Abyssinya provides clear instructions and guidance on how to trial their FinTech services effectively					
7	Bank of Abyssinya offers incentives or rewards for staffs who try out and provide feedback on their FinTech solutions					
8	The process of trialing FinTech practices at Bank of Abyssinya is hassle-free and convenient					
V. Observability						
1.	I have observed others using FinTech services and benefiting from them.					
2.	FinTech success stories and positive user experiences are widely shared and discussed.					
3.	I am Observed about the security and privacy risks associated with FinTech.					
4.	I am not worry about potential financial losses or scams when using FinTech platforms.					
5.	The benefits of using FinTech practices at Bank of Abyssinya are clearly visible and tangible to me as a customer					
6.	I can easily observe the positive impact of FinTech practices on my financial transactions and experiences with Bank of Abyssinya					
7.	Bank of Abyssinya provides real-time updates and notifications that make the benefits of FinTech practices evident to me					

Part III: Fintech Adoption

Please Tick (“√”) using a five-point Likert rating scale of 1-5 Liker Scale for the extent to which your organization has experienced the *adoption of FinTech* outcomes as a result of the above determinants in Bank of Abyssinia staff.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral or Moderate	Agree	Strongly Agree

Adoption of FinTech						
Sq.	Variables	1	2	3	4	5
1	I have already adopted FinTech services.					
2	I regularly use FinTech platforms for my financial needs					
3	I am likely to recommend FinTech services to others					
4	I believe I have the necessary skills and knowledge to use FinTech effectively.					
5	I am confident in my ability to navigate and troubleshoot issues on FinTech platforms.					

III. What are the strategies used by the Bank of Abyssinia the adoption of FinTech

Thank you for your time to respond to these questions!!!