The Role of Financial Technology on Financial Inclusion and Profitability: The Case of Selected Commercial Banks in Ethiopia

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This is to certify that the thesis prepared by Senait Girma, entitled "The Role of Financial Technology on Financial Inclusion and Profitability: The Case of Selected Commercial Banks in Ethiopia," submitted in partial fulfillment of the requirements for the degree of Master of Science in Corporate Finance with a specialization in Investment Management, complies with the regulations of the University and meets the accepted standards of originality and academic quality.

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Abstract

This study focuses on analyzing the role of financial technology (FinTech) in enhancing financial inclusion and profitability, with a specific emphasis on selected Ethiopian commercial banks. The study also utilized financial data from 2010 to 2023 and adopted an explanatory research design. Primary data were collected from 210 high-level managers across 12 purposively selected banks, supplemented by financial statements (2010–2023). A structured questionnaire was used as the primary research instrument, focusing on three main FinTech dimensions: alternative payment methods (APMs) and automation (Auto) as independent variables, and financial inclusion (FI) as a mediating variable. A total of 210 questionnaires were distributed to the selected banks. To evaluate the relationship between FinTech and profitability (measured by net profit margin), the study employed multivariate regression analysis. Given the quantitative nature of the research, explanatory statistical techniques were applied using SPSS software for data analysis and presentation. The findings indicate that FinTech dimensions—specifically APMs and automation—positively influence financial inclusion. Results revealed that APMs significantly improved Financial inclusion ($\beta = 0.648$, $p = 0.006$), while automation had a moderate effect ($\beta = 0.401$, $p = 0.05$). Financial inclusion mediated 34.5% of profitability variance ($R^2 = 0.345$), underscoring FinTech's role in operational efficiency and inclusive growth. The findings advocate for strategic investments in APMs and automation to bolster bank performance in emerging markets.

Key Words: FinTech, Alternative payment methods, Automation, Financial inclusion, profitability, commercial banks

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Financial Technology comes from two words: finance and Technology. It is described as recent technological advancements improving financial services. It refers to any app, software, or technology that allows people or business to digitally access, manage, or gain insights in to their finances or make financial transactions (Drew, Andrew & Neil, 2017).

Financial technology has both benefited and disrupted in the financial industry. The arrival of big data, block chain, artificial intelligence, and other sophisticated technologies in financial organizations has had a major impact on financial markets throughout the world. As binding financial entities banks have been affected by financial technology in two ways: “outside financial technology” and “bank financial technology” (Cheng &Qu, 2020). Outside financial technology is mainly related to the appearance of financial technology firms, while bank financial technology indicates the innovative technology that has been applied by traditional banks.

In the last few decades, application of information technology in business strategies has become at the very heart of the competitive process. As economy moves from lower to higher stages of development, business processes are shifting from simpler to modern and complex techniques of production. In this regard information technology has played a great role in changing input-output relationship of production activities. Business

organization, especially the banking industry is operating in a complex and competitive environment characterized by changing conditions and highly unpredictable economic climate (Agbolade, 2011).The use of technology in the banking sector is to produce banking services and products that meet customer needs and desires (Mbama 2018). And the use of technology in the banking sector is to produce banking services and products that meet customer needs and desires (Mbama 2018).

Modern banking in Ethiopia was first introduced in 1906 when the bank of Abyssinia was established based on the agreement being reached between the Ethiopian government and the British owned national bank of Ethiopia. Bank of Abyssinia was inaugurated by Emperor Menelik II on February 16 1906. In 2024 there are thirty two commercial banks operating in Ethiopia from these banks 30 are private banks and 2 of them are government banks (Wikipedia.org.3/5/2024).

Currently most of Ethiopian Banks have started providing Technology-based services/products like ATM (payment cards), Mobile banking, Internet Banking, SMS banking and Electronic fund transfer to their customers. Nevertheless, in order to overcome local and global competition, Ethiopia's commercial banking needs to raise the role of financial technology on their performance and properly establish.

1.2 Statement of the Problem

By integrating modern technologies, commercial banks' financial performance will improve and new products and services will be easily accessible on the market. This is evident from the work of Tonui, et al. (2020). Throughout the years, financial technology

has significantly affected how financial institutions work and have laid a foundation whereupon banks are able to differentiate their products from those of competitors (Cihak& Sing, 2013). The banking industry has seen a significant rise in the use of financial technology worldwide. This has greatly reduced costs by increasing the efficiency of banking sector activities, including electronic payments, internet and securities trading, and product improvements. As a result, the standard of services provided by banks worldwide has increased (Berger, 2003).

In the context of Ethiopia, the banking sector has also witnessed the adoption of various fintech solutions, with the goal of improving financial inclusion, operational efficiency, and overall financial performance. References (Atiase, Mahmood, Wang, & Botchie, 2018). The following factors have contributed to the growth of modern financial innovation in Ethiopia: lower costs associated with bankruptcy, tax benefits, lower moral hazard, lower regulatory expenses, transparency, and customization. Ethiopian commercial banks are using and developing e-banking technologies due to a number of motivating factors (Kassahun, 2016).

This study explores the impact of fintech solutions on financial inclusion and overall banking performance in the Ethiopian context. "However, the extent to which these fintech innovations have impacted the financial performance of selected Ethiopian banks remains unclear (Kidane & Adugna, 2019). This study examines the impact of fintech adoption on the financial performance of selected commercial banks in Ethiopia, but acknowledges the need for further research to fully understand the extent of these impacts (Tessema & Habte 2021)

Despite Ethiopia's rapid FinTech adoption, its impact on bank profitability remains understudied. Prior research (e.g., Kidane & Adugna, 2019) focused narrowly on operational efficiency, while Jote (2023) analyzed innovation types but omitted financial inclusion's mediating role. This creates a critical gap: without evidence on how APMs and automation translate to net profit margins, banks cannot prioritize investments strategically. For instance, CBE's Amole wallet reached 8 million users (EBEA, 2024), yet its profitability contribution is unquantified—a disconnect this study resolves.

The problem is not merely descriptive but analytical. Ethiopia's banking sector faces rising competition from mobile money (e.g., M-Pesa's impending entry), yet 85% of transactions remain cash-based (NBE, 2022). If banks cannot prove FinTech's profitability mediation, policymakers may underfund digital infrastructure, perpetuating rural exclusion. This study thus interrogates not just whether FinTech aids inclusion, but how it does so profitably—a question vital for Ethiopia's Digital 2025 goals.

Ethiopia's FinTech adoption lags far behind global and regional peers. Despite 75% mobile phone penetration (World Bank, 2023), only 11% of Ethiopians actively use digital banking (NBE, 2023). This disconnect persists due to infrastructural gaps—just 28% of rural branches offer mobile banking (NBE, 2022)—and regulatory hurdles, such as the 2020 telecom monopoly that delayed mobile money rollout. While studies like Damtew (2021) confirmed e-banking's operational benefits, none quantified its impact on profitability in this low-adoption context. For instance, banks invested $120 million in FinTech infrastructure from 2020–2023 (EBEA, 2023), yet ROI remains unmeasured, risking capital misallocation.*

*The problem is not just low adoption but its economic ripple effects. With 85% of transactions still cash-based (NBE, 2023), banks incur high servicing costs (averaging 22% of revenues, CBE AR 2022). This study fills a critical gap by analyzing how FinTech—specifically APMs and automation—can convert Ethiopia's 72% unbanked population (NBE, 2023) into profitable customers, providing actionable insights for banks and policymakers ahead of Ethiopia's full telecom liberalization in 2025.

The study aim to fill those gaps to examine how financial technology impact profitability Ethiopian selected CBs with variables financial inclusion, alternative payment methods, and automation affect important financial measures including net profit margin.

1.3. Research Question

Based on the statement of the problem and review of related literature, this study seeks answers for the following questions;

- Does the financial technology influence the net profit margin?
- Does the financial technology influence financial inclusion?

1.4. Objective of the study

1.4.1. General Objective

The general objective of the study is to examine the Role of financial technology on financial inclusion and bank's profitability in the case of Commercial banks of Ethiopia.

1.4.2 Specific Objectives

This study was conducted to achieve the following specific objectives

- To evaluate the impact of FinTech adoption (alternative payment methods and automation) on financial inclusion in Ethiopian commercial banks.

- To assess the relationship between financial inclusion and bank profitability, measured by net profit margin.

- To determine whether financial inclusion mediates the link between FinTech adoption and profitability, testing the indirect effects of APMs and automation.

1.5. Significance of the study

The purpose of this study is to provide information to the Ethiopian banking sector to help with strategic decision-making and policy formulation by analyzing the opportunities, obstacles, and potential hazards associated with Fin Tech adoption. The National Bank of Ethiopia may utilize the study's findings as guidance when creating regulations governing Ethiopian commercial banks' fin tech practices. Researchers can detect new patterns and prospective areas for further exploration by using the report as a reference point to evaluate the current and future potential of Fin Tech in the commercial banking sector. It will also have academic contributions as a case study in the area.

1.6. Scope of the Study

The study's focus is on analyzing how Ethiopian commercial banks' profitability is affected by their implementation of financial technology. In particular, the study looks into how the adoption of financial technology , which includes automation, alternative payment methods and financial inclusion, affect important financial metrics like net profit margin.

1.8. Limitation of the Study

The first limitation of this study is that it fails to measure the effect of fintech on operational performance of the selected banks. The other limitation relates to issues like Self-reported data may inflate FinTech

1.9. Organization of the Study

The study consists of five chapters. Chapter one:-This chapter is the introduction chapter which presents background of the study, statement of the problem, research question, research hypothesis, and objective of the study, significance of the study, scope and limitation of the study. The second chapter deals with review of related literature regarding the topic of the study. The third chapter discusses the research methodology and methods. Chapter Four is presents the data analysis results and their interpretation. Finally, based on the analysis and interpretation of the findings Chapter Five presents the conclusion and recommendation.

CHAPTER TWO

REVIEW OF RELETED LITERATURES

2.1 Theoretical Literature Review

There are several theoretical explanations linking the study variables. Some of these theories that closely relate to this study are presented next to be followed by empirical findings and conceptual framework for this study.

2.1.1. Technology Acceptance Model (TAM)

The Technology Acceptance Model is a system through which, when explaining how people adopt and use new technologies, one can tell that the consumers, in deciding on the acceptance of technology, are highly influenced by their perception of its perceived usefulness and ease of use.(Davis, 1989).

It is for this reason that TAM has, so far, been applied in the FinTech industry to shed light on the perceptions and adoption of various financial technologies by bank users. For instance, Hu et al. (2019) conducted an empirical investigation using a TAM extended model for bank clients who intend to use FinTech services. Indeed, the results pointed out that the intentions of those customers to use FinTech services were highly contributed by perceived usefulness and perceived ease of use; hence, it underlined the importance of TAM within this sector.

2.1.2. The theory of financial intermediation

The **Diffusion of Innovations Theory** (DOI) is a model developed by Everett Rogers in 1962 to explain how and why people and cultures adopt new ideas and technology, the rate at which they do so, and the media used to diffuse the new ideas. The hypothesis suggests that an variety of factors such as the invention itself, channels of communication, social systems, and characteristics of the adopters influence the speed at which the innovations will be adopted. According to Korir, this framework also explains the process of diffusing new ideas and technologies in a market. Understanding the adoption process for financial innovation is dominant to assessing its effect on banking performance.(Korir, 2014)

The theory of Diffusion of Innovations provides insights into the adoption of Fintech both for customers and banks. For instance, FinTech services might be put to use by banks due to perceived advantages in increasing customer service and efficiency. Trial-ability and compatibility of such technologies with existing banking processes can lead to further diffusing the technology.

2.1.3. Resource –Based View (RBV)

The concept suggests that through unique resources, including technological innovations, a firm can have a competitive advantage. Advanced technologies can enhance the effectiveness of operations and delivery of services in financial institutions. (M'mata&Weda, 2022). Resources differ in value, so states Resource-Based View (RBV), developed during the 1980s and 1990s; a business may outperform its rivals through effective utilization of special resources. Resource-Based View theory: From

this point of view, the unique resources and capabilities of the firm are seen as critical to competitive advantage and above-average performance, thereby creating lasting differences amongst firms. Financial technologies, such as those enabling banks to improve customer service and process efficiency, have been said to enable financial technologies to give banks distinct competitiveness from rivals and enhance their financial performance.(Barney, 1991).

In the context of fintech, the Resource-Based View can be used to explain how financial institutions utilize special resources and abilities for a competitive advantage in the rapidly changing market of financial technology. For instance, banks may well succeed in designing and providing FinTech products and services more successfully than their competitors in case of the bank having highly qualified personnel, an appropriate technology base, and good relations with clients. (Hafez et al., 2023). The above implies that internal resources are crucial in building the bank's capability to compete in FinTech.

2.1.4. Financial Inclusion Theory

This is an approach stressing how necessary it is to grant access to financial services to the excluded. Thus, mobile banking is very often considered as a way to improve financial inclusion in developing countries, such as Ethiopia. It is also about an idea and a framework that puts strong emphasis on granting all people and enterprises, particularly those that are marginalized or excluded from the formal financial system, access to financial services. It assumes that financial inclusion has the utmost relevance and is an essential characteristic of welfare, reduction of poverty, and economic

development.

Financial Inclusion: It is defined as access to and the delivery of essential financial services to all categories of citizens. The people and enterprises could, therefore, be said to be financially included where they have access to affordable financial services and products that meet their needs in a responsible and sustainable way. Yet, the means through which financial inclusion approaches are attained vary from Nation to nation; hence, there is a need to decipher the underpinning ideas or hypotheses that explain these variations. These ideas or precepts are what have been termed theories (Ozili, 2020)

Financial Inclusion Theory best fits FinTech because most of the businesses try to enhance the accessibility of financial services to less privileged people in innovative ways. An example is mobile banking and digital platforms that provide easier access to financial facilities in most rural areas where regular banks could not possibly reach. Various studies show that financial inclusions tend to lead to better economic outcomes, including increased saving, investment in education, and better health. According to Alnabulsi&Salameh (2022), in this respect, FinTech innovations can act as a good vehicle to bridge the gap of access with cost-efficient and easily accessible financial services for people who otherwise could not reach them.

FinTech is the whole range of innovative products and services that add value to financial services by harnessing developments in information and communication technologies. Applications vary from credit cards and electronic money to internet payments and automated banking services. It covers the whole range of innovative products and services that add value to financial services, developing information and communication

technologies. Its uses range from credit cards and electronic money to Internet payments and automated banking services.(Barbu et al. 2021; Abad-Segura et al. 2020).

Fintech comprises of computer software and technologies that make banking services towards inventing many types such as online payment, credit cards, wiring money, e-money, ATM, , etc. (Nurlaela et al. 2020)

The Technology Acceptance Model (TAM) posits that perceived usefulness and ease of use drive FinTech adoption (Davis, 1989). However, in Ethiopia, only 32% of adults understand mobile banking (NBE, 2023), suggesting cultural and educational barriers may weaken TAM's applicability. Similarly, while Resource-Based View (RBV) theory links technological assets to profitability (Barney, 1991), just 31% of Ethiopian banks have invested in AI/APIs (EBEA, 2023), creating a resource asymmetry that could skew competitive outcomes

Financial performance

Indicators of financial performance usually include profitability, revenue growth, and return on investment. From the literature review, it can be stated that the financial performance of SMEs improves after the implementation of FinTech solutions due to increased efficiency in operations and proper management of resources. Thus, Alkhawaldeh et al. (2023) have claimed that SMEs which adopt FinTech solutions can show better financial performance due to increased efficiency and proper management of resources. Since 2008-2009, fintech has been considered a new segment, which is being by the commercial bank, the insurance company, and other traditional financial

institutions (Arner et al., 2015; Goldstein et al., 2019). Financial performance is a measure of how well a firm can use assets from its primary mode of business and generate revenues (Bessler et al., 2008)

Performance measures can drive the introduction or execution of technological innovations and organizational change through rewards for performance improvement and measurements that device progress towards this objective. According to Adam, (2014) the defined firm's ability to realize a number of predefined financial objectives, which include profitability. According to Almajali, Alamro and A- Soub (2012), it also exhibits the extent at which financial objectives are being realized. According to Baba and Nasieku (2016,)

Financial performance is also provides guidance to stakeholders in their decision-making by demonstrating how a company generates income through the use of its assets. Nzuve (2016)

2.2. Impact of fintech on banking sector

The adoption of FinTech has provided evidence in terms of excellence in financial services, reduction of transaction costs, and promoting more secure and user-friendly banking experiences. Nguyen et al. (2021), Chen et al. (2019), Yao and Song (2021) the financial technology-Fintech-eases getting credit facilities from banks to institutions, and Fintech develops small banks. Besides that, Alwi (2021)

The use of technology in the banking industry is to create banking products and services that fulfill the needs and desires of customers. Mbama 2018.Friedline et al. 2018 state

that FinTech allowed all sections of society to achieve better financial inclusions, and the development of FinTech within a country can be related to its positive impact on banks and public. FinTech has a significant role in reducing the volume of credit facilities bearing high interest rates. Petralia et al. (2019) also included that the introduction and development of FinTech has significant impacts on traditional banking business models. Similarly, FinTech is dominating various financial sectors such as lending, depositing, investment, account settlement, and raising capital (Nguyen et al. 2021). Arslanian and Fischer (2019) further included that there is a competition going on between traditional banking services and FinTech. This somehow affects traditional banking services negatively regarding their risk-taking, performance as well as innovation. Buchak et al. (2018) were among the first to consider the role of regulatory aspects in studying the impact that FinTech has on providing a credit service as a force in bank financial performance.

2.2.1-Automation

Swan (2017) explained that in case of substitution of human labour by robotic technologies, wholly or partly automated economy can be used to handle the process of economics. The focus is now shifted towards how technology can facilitate better access to banking services. Let everyone be aware that banks and other financial institutions because of automation execute more numbers. A suitable example can be Sobczak, 2022. That indicates how institutions, most especially automation, are increasingly adopting IT solutions as drivers for digital transformation and improvement in operational efficiency. Besides that, it saves costs and enhances

the quality of service, which then becomes an important thing for competitiveness within the financial sector.Automation of banking procedures is concerned with deploying the use of technology so that human intervention can be reduced and operational efficiency is enhanced. The dimension shows how technology may render services easier and inexpensive.

Key Components of Automation in Financial Services

Robotic Process Automation (RPA):

RPA: Software automates repetitive and rule-based processes, including but not limited to data entry, transaction processing, and compliance checks. This way, manpower will not be utilized as much; hence, the process will be less erroneous and speedier.

Artificial Intelligence and Machine Learning:

Next, AI and machine learning technologies sift through large packets of data, draw patterns, and if needed, predict outcomes to make decisions. Applications include finance-credit scoring, fraud detection, and customized customer service. Automation of Customer Service:

Automation tools also allow better customer service by the instant response while transactions and suggestions might be personalized based upon customer behavior.

3 Operational Efficiency

Automation smoothed the workflow and hence reduces processing time and operational costs involved. It therefore enables financial institutions to manage their resources more effectively and pay attention to strategic initiatives.

2.2.2 Automated payment method

Automated means, therefore, would aim at improving efficiency, reducing errors, and generally enhancing customer experiences by systems that refer to technologies that support or enable independent automatic processing of payments without manual interference. Types of Automated Payment Methods

Direct Debit: a financial transaction wherein one party withdraws a certain amount from another party's bank account automatically, applied to a recurring bill, such as utility or subscription bills.

Recurring Payments: those set to take place over regular time intervals, such as monthly subscriptions to stream certain services or gym memberships.

Electronic Funds Transfer EFT means an arrangement whereby cash is transferred from one account to another electronically. It may include but is not limited to payroll deposits or vendor payments.

Mobile Payments Solutions: Applications that enable users to make payments with the use of their mobile devices. These are often integrated with automated systems to make their use more convenient.

APMs enable access to financial services for those without regular banking accounts.

For example, due to mobile phone payment solutions, consumers simply carry out transactions without the need for any presence of banks in the area where they reside and work or seek entertainment. In this respect, Swan thus postulates that "Mobile money has the potential to be an additional gateway through which financial services become both more accessible and inclusive" (Swan, 2017).

2.2.1 Fintech -Financial Inclusion

It is possible to define financial inclusion as efforts that make basic financial services available for all by simplifying the obstacles. According to the definition of the World Bank, "financial inclusion means that 'individuals and businesses have access to useful and affordable financial products and services that meet their needs; transactions, payments, savings, credit and insurance delivered in a responsible and sustain able way'"(Demirguc-Kunt et al., 2017). According to Yoshino and Peter Morgan, 2016, "Financial inclusion can be defined as the degree of access of households and firms, mainly poorer households and small and medium-sized enterprises SMEs to financial services.

2.2.6 **The net profit margin**

Net profit margin is the very important financial ratio that reflects what portion of an income remains as profit after deduction of all expenses, taxes, and costs. It basically denotes the key indicator of profitability and efficiency of the operations of the company.

2.3. Empirical Review

2.3.1 **Empirical Review** Global

Since then, the relation between fin tech and bank financial performance has come under the focus of many studies' research. Most of the conclusions drawn from these refer to a positive correlation between Fin-tech and Financial Performance.

Thair, Hafez, Mahmoud, and Qais (2023) discuss the reality that the work "Does Adoption of Financial Technology Affect Bank Performance?" researches the impact of Fin Tech on Jordanian banks in terms of the financial performance of these banks. It tends to investigate how different characteristics of FinTech, such as financial inclusion, automation, and alternative modes of payments, relate to main indicators of financial performance like total loans issued, total deposits, and net profit margin. Key Finding

Positive Impact on Total Deposit The research evidence shows that FinTech dimensions positively influences the amount of total deposit in banks. The results showed that Fintech significantly enhanced the total loan amount. The adaptation of FinTech simplifies the process of application for loans which motivates customers to seek various credit facilities. From the data, it is established that fintech applications explain about 84.5% variation in total amounts of loans. Results also show that the adoption of FinTech positively influences banks' net profit margins. Adoption of FinTech solutions has been associated with lower operating costs and larger sales volumes, which, in turn, correspondingly translate into larger levels of profitability.

Methodology: This study gathered responses from 41 respondents through the administration of an appropriately prepared questionnaire on the relationship between FinTech characteristics and financial performance measures. Regression tests, along with some other statistical tests, were performed to validate the hypothesis. In fact, the conclusion of the paper is that the implementation of FinTech remarkably enhances Jordanian commercial banks' financial performance by positively affecting net profit margins, total loans, and total deposits. From these results, it can be established how important it is for the banking industry to implement Fintech solutions as a way of adding more effectiveness in terms of operations and competitiveness in a financial environment that rapidly changes.

A study examined by Mohammed &Hasan (2023) It is titled "The Impact of Financial Technology on Banking Performance: A Study on Foreign Banks in the UAE" and has researched the relation between Fintech innovations and the performance of foreign banks operating in the United Arab Emirates. This research study tries to find out how Fintech would affect the performance of banks. The study has placed special emphasis on metrics such as ROE and ROA or return on assets. The quantitative method is followed to measure the performance of the same foreign banks before and after the introduction of Fintech services. A total of 26 foreign banks currently operating in the United Arab Emirates were covered by the study. It considers different forms of electronic financial services and checks their connection with different banking performance indicators. This is because, according to the research findings, Fintech positively and significantly influenced the banking performance of foreign banks in the United Arab Emirates. The expansion of the electronic financial services paves the way

for expanded performance and quality of banks. The main findings of the study revealed that the use of Fintech resulted in customer satisfaction due to the efficiency in the service delivery. It has been revealed in the report that banks should enlarge the scope of their electronic financial services and address more people. The report also pointed out that the ease of interfaces and linguistic support will add to influencing people to embrace technology to push for broad use of Fintech solutions. The report mentioned that in innovating and producing new monetary applications, banks are encouraged to cooperate with technology specialists.

According Xu(2022), the research area is the influence of FinTech adoption on the performance of banks in Europe because FinTech has been identified as a significant enhancer in the banking industry. Thus, this paper deems it worthwhile to fill the gap in the existing body of empirical research within the European context on how financial innovations can affect bank performance through the CAMEL rating system, which tries to evaluate Capital adequacy, Asset quality, Management efficiency, Earnings power, and Liquidity management. The existing literature reveals a research gap in analyzing the direct impacts of bank-specific FinTech initiatives from the angle of commercial banks. This paper therefore seeks to carry out text-mining analysis on annual reports from 48 commercial European banks over the period from 2015 to 2021. It quantifies the degree of FinTech adoption and its relation to performance metrics. Given this context, this paper applies descriptive statistics and regression models to assess such impacts. The results suggest that most dimensions of bank performance are positively affected by FinTech adoption, supporting the "innovation-growth" perspective, whereby financial innovations result in gains in efficiency and overall

performance. In this respect, banks are encouraged to concentrate resources in developing and implementing financial technologies to boost their efficiency and earn significant dividends from such investments.

2.3.2 Empirical Review in Africa

Kemboi, (2018) The paper "Effect of Financial Technology on the Financial Performance of Commercial Banks in Kenya" by Kemboi, 2018, looks at the effect brought about by financial technology on the financial performances of Kenyan commercial banks. This research is well motivated since rapid evolution in Fintech and its consequences on how traditional banking practices are carried out. The main objective, therefore, is to explore the use of various aspects of financial technologies like Internet banking, mobile lending, agency banking, and mobile banking in order to assess how they influence the financial performance of Kenyan banks. The Resource-Based View, Technology Acceptance Model, Diffusion of Innovations Theory, Service Quality Models, Innovation Theory, and Stakeholder Theory provide some theoretical perspectives guiding this study. They clarify the status of technology adoption and the performance of banking. The research methodology used in this study is quantitative, where data from more than one Kenyan commercial bank will be utilized. The aspects that will be under investigation in this study include the relationship between the uptake of fintech and indicators of financial performance such as efficiency and profitability. These results supportively correlate the monetary success and utilization of financial technologies by banks. While association size does vary, it also overtones the same message that fintech is not solely the success determining factor but can surely help in enhancing performance. The study thus

advocates aligning operations in banks with fintech innovations through a strategic initiative to enhance their competitive positioning. This has suggested partnerships with Fintech startups and investment in technology for better service delivery and improvement in customer satisfaction.

A study conducted by M'mata (2022)This therefore seeks to report on the impact of banking innovations on the financial performance of commercial banks in Nairobi, Kenya. The general objective will be to establish the effect brought about by various banking technologies, especially automated teller machines (ATMs), mobile banking, and agency banking, on the financial performance of commercial banks in Nairobi County. This research has applied Agency Theory to review the relationship between principals and agents within a decision-making process, and the Schumpeter's Theory of Innovation, emphasizing the roles of innovation in making up economic growth and competitiveness. In this paper, the quantitative approach has been employed through which information from bank clients and staff was gathered with the help of surveys. Descriptive statistics remain the key analytical method utilized to evaluate how the identified banking innovations affect financial performances. Results show that agency banking has a positive effect on fee-based income and, in that process, increases the income-generating capacity of banks. However, mobile banking and ATMs are also related positively to financial performance, though there is less emphasis on specific details of such innovations from the findings.

Haabazoka (2018) performed a study to establish how technological changes influenced financial performance in Zambia's commercial banks. The study used a descriptive

research design to explain the relationship between the variables, using monthly data for all 19 banks in Zambia over a four-year period. The main areas of innovation the study surveyed to establish how technological innovation affected bank performance assessed by income were three: Automated Teller Machines, mobile banking, and Internet Banking. Secondary data sourced from the Bank of Zambia and audited financial accounts from different commercial banks. Through this study, the results indicated that, while internet banking was weak and did not influence the financial performance of commercial banks in Zambia, mobile banking and ATM were favorable and significant.

2.3.3 **Empirical studies in Ethiopia**

A study conducted by Jote (2023) This study, therefore, tries to establish the impact of financial innovation on the financial performances of commercial banks in Ethiopia. It follows a descriptive and diagnostic research design; a qualitative approach to data collection has been adopted, formatted on a Likert scale through questionnaires. In this respect, the descriptive research design describes the financial innovations in commercial banks, while the diagnostic research design inspects the relationships that exist between the financial innovations and their consequence on financial performance. The study analyzes how different forms of financial innovations-institutional Agency banking, online banking, ATMs, and mobile banking-influence the financial performance of commercial banks by applying the multiple regression model. The study established that financial innovations such as agency banking, mobile banking, and the use of ATMs significantly enhance the financial performances of commercial banks. This is due to increased productivity, reduction of operation costs, as well as

enhancement of customer service. Future studies should integrate qualitative and quantitative research methods. The scope of this study was limited to only commercial banks. Other future studies could try to test the effect of financial innovations on other financial institutions, such as insurance companies, microfinance, and telecommunications.

A study by Menza; Jerene; and Oumer (2024) in the paper, "The Effect of Financial Technology on Financial Inclusion in Ethiopia during the era of the Digital Economy", the authors assessed the extent to which financial technology has gone in improving the inclusiveness of finance in Ethiopia. In all these aspects of the impact of access to financial services, the paper studied various fintech, like ATMs, POS terminals, mobile banking, and agent banking amongst others. Innovations like agent banking, POS terminals, and ATMs greatly increase financial inclusion. For example, looking at the POS terminals alone, 0.2656% association of the number of terminals has been seen in financial inclusion while every additional agent has increased account holders by 5%. Internet banking was found to have a negative insignificant effect on financial inclusion in Ethiopia. This is contrary to previous studies that had found a positive relationship between internet banking and financial inclusion. The authors used regression analysis to study the relationships of various financial technologies with financial inclusion, drawing from data of nine commercial banks in Ethiopia. The authors recommend increased adoption of digital banking technologies, especially in the rural parts, as a way of improving financial inclusion strategies. They also go ahead to recommend that future studies restrict their focus to pure digital financial technologies such as mobile money services.

Darge (2022) conducted a study on The Effect of Technological Innovation Uptake on the Financial Performance of Commercial Banks in Ethiopia taking the financial performance of nine commercial banks operating in Ethiopia for a period of seven years (2015-2021). The study indicated how technological advancements such as mobile and internet banking, and the use of ATM, debit cards, and POS terminals are vital for bank performance improvement. It showed overall that there is a positive relationship between technological innovation uptake and the financial performances of banks, and it insinuates that banks may improve profitability by adopting the technologies.

According to Damtew (2021) "Effects of Electronic Banking on the Financial Performance of Commercial Banks in Ethiopia" e-banking and its impact on the financial performance of commercial banks in Ethiopia: 2015/16 period, electronic banking had on significant financial indicators, identified as PBT and ROA. It indicated how electronic banking can improve efficiency, customer satisfaction, and profitability.

A study examined by Andinet (2021) titled "Effect of Financial Innovations on Profitability of Private Commercial Banks in Ethiopia" analyzed the impacts of several financial innovations on the profitability of private commercial banks in Ethiopia during the period from 2016 to 2020. Based on this, the regression analysis indicates that most of the financial innovation variables, especially agent banking, point-of-sale terminals, and Internet banking, have a positive significant effect on the bank's profitability status, as measured by Return on Assets. Various theories support the findings in that they attest to the fact that financial innovations enhance profitability. The study thus concluded that for the profitability and sustainability of competitive advantage in Ethiopian's banking

industry, attention should be directed toward the creation of awareness and adoption of financial innovations. Temame (2018) also focused the relationship between financial innovations and the financial performance of commercial banks in Ethiopia. The last section summarizes the findings, makes suggestions on how banks can enhance performance with financial innovations, and identifies gaps for further research.

Global studies affirm FinTech's positive inclusion-profitability link (e.g., Gomber et al., 2017), but Ethiopian evidence is mixed. For instance, internet banking—a key driver elsewhere—reduces inclusion in Ethiopia (Menza et al., 2024), likely due to its urban skew (78% of users are in Addis Ababa, NBE 2023). This disparity underscores the need to contextualize global theories in low-infrastructure settings.

2.4 Conceptual frame work

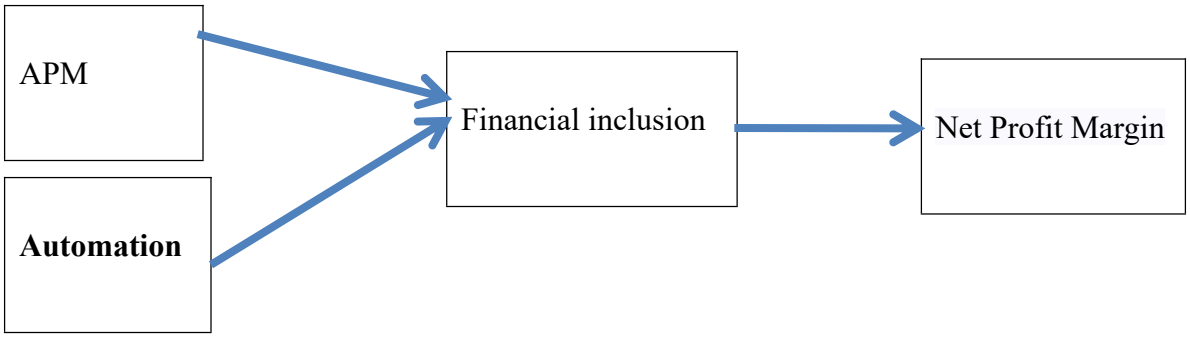

Fig. 2.1. Conceptual framework (adapted from Thair, Hafez, Mahmoud and Qais, 2023).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of the Study Area

The research study area was cover Ethiopian commercial banks with ten years of data. This means it excluded new entrant banks and focused on banks that have been operating for more than ten years. This bank facilitates financial transactions, lending, and other banking activities, playing a key role in the country's economy by providing a range of financial services to individuals and businesses.

3.2. Research Approach

To examine the research questions and the objectives, when we see the, the researcher approach appropriate to be used is a quantitative research approach. This helps to analyze the role of fintech on banks profitability taking responses from large volume of respondents and datasets. Hence, Likert Scale quantitative data coupled with profit information is used for this study.

3.3. Research Design

To achieve the study objectives, the study adopted explanatory design to examine the role of financial technology on the profitability of Ethiopian commercial banks using a questionnaires and profit information from the annual reports. This was the right design

when it was needed to test relationship of variables as independent, mediating and dependent variables.

3.4. Population and Sample

According to Asika (2006), by nature and distribution pattern, it was nearly impossible to conduct an exhaustive examination of the entire population. As a result, a representative sample of the study population was chosen. According to the national bank, there are 33 commercial banks in Ethiopia; however, 17 institutions founded after 2010 were not included. For the study period of 2010–2023, the research population consisted of 16 Ethiopian commercial banks with financial information accessible that were created before 2010.

Hence, this study used purposive sampling to select participants from the target population (out of the thirty-three commercial banks in Ethiopia, twelve were selected as the sample for this study). The researcher used this sampling technique to have knowledge of financial technology adoption and bank profitability with the commercial banks.

3.5. Data sources and type

3.5.1. Primary data source

The primary data source for the study was structured questionnaires that were distributed to key management in 12 Ethiopian commercial banks. The questionnaires focused on gathering quantitative data related to perceptions of financial technology adoption and its role of fintech for financial inclusion and bank's profitability. The selected 12 banks were:

Awash International Bank, Commercial Bank of Ethiopia, Abay Bank, Dashen Bank, Enat Bank, , Bunna Bank, Bank of Abyssinia, Nib International Bank, Cooperative Bank of Oromia, , Wegagen Bank, Zemen Bank and Hibret Bank

3.5.2. Secondary Data sources

Secondary data sources included financial statements of banks from the period 2010–2023, which were reviewed to obtain information about bank profitability indicators such as net profit margin from National bank.

3.6. Data Collection Procedures

The target study shall survey 12 Ethiopian commercial banks. In this regard, it has to design a structured questionnaire for the responding banks. In this case, the 12 out of the existing 33 banks have been excluded 17 due to establishment issues and will make use of secondary data on the financial statements of those banks from 2010 to 2023.

3.7. Data Analysis Method

Descriptive statistics of demographic variables were applied in the study, including the mean, median, mode, and standard deviation for age, gender, education, years of experience and job title. Responses to questions on a Likert scale related to dimensions of financial technology—such as financial inclusion, alternative payment methods, and automation—were summarized. Hypotheses were developed based on the research objectives and literature review, and the significance of the relationships between financial technology and bank's profitability variables was tested statistically.

3.8. Model Specification and Operational Definition of Variables

3.8.1. Model Specification

The adopted model that explained the Role of fintech for financial inclusion and profitability of Ethiopian banks was discussed in this section. The specification of the model allowed for an understanding of the relationship between the dependent and independent variables. The model was designed to test the hypotheses through which the Role of fintech for financial inclusion and profitability indicators was examined. In this context, financial inclusion as mediating variable profitability indicators included the dependent variable: net profit margin, while the independent variables were the FinTech dimensions— alternative payments, and automation. The model was developed based on previous literature.

$$Yi=\beta 0+\beta 2APMs+\beta 3Auto+\epsilon$$

Y i denotes financial inclusion (the mediator variable)

β_0 is the model's intercept. B2 and β3 are the coefficients representing the effect of alternative means of payments and automation correspondingly on the items of financial inclusion

$$Yi=\beta 0+\beta 1FI+\epsilon$$

Y i denotes the bank is profitability indicators which could be net profit margin and.

β_0 is the model's intercept. B1 is the coefficients representing the effect of financial inclusion correspondingly on the items of profitablity.

The mediator variable FI_i

The independent variables are defined for bank i: $APMs_i$ and $Auto_i$

ϵ_I is the error term, which capture that variation in Y_I not explained by the independent variables.

3.8.2. Operationalization of study variables

It is also important to note that precise identification and operationalization of the variables under study are warranted in this regard, considering that the Role of fintech for financial inclusion and profitability in Ethiopian commercial banks.. In so doing, the variables become measurable and, hence, susceptible to efficient analysis. The operationalization of the independent and dependent variables is shown below.

Independent Variables

The independent variables in this study were the dimensions of FinTech, which included

Automation

Automation within the banking environment refers to using information technology to provide greater efficiency and an improved customer experience in services previously performed manually.

Operationalization: Measure the level at which banks have automated their services

Through a questionnaire, respondents were asked to indicate on a 5-point Likert scale the degree to which they perceived the automation of banking services as effective, ranging from 1 = Very Ineffective to 5 = Very Effective.

Alternative Payment Methods (APMs)

Alternative payment methods refer to ways of paying for goods or services that differ from traditional payment modes, such as mobile payments, digital wallets, and online payment platforms.

Operationalization: This was measured through a questionnaire that assessed the level of adoption and frequency of use of various alternative payment methods. Respondents were asked to indicate, on a 5-point Likert scale, how frequently they used different forms of payment for goods and services, ranging from 1 = Never to 5 = Very Often.

The Mediating variable

Financial Inclusion (FI).

Definition: Financial Inclusion may be defined as access to and usage of financial services to households and their members, particularly the excluded or under-served sections, through a range of various forms at an affordable cost.

Measured via a survey that evaluates clients' access to and use of financial services, including bank accounts, loans, and insurance. The level of agreement with the statements about the ease of access to financial services was based on a 5-point Likert

scale ranging from 1 to 5, where 1 represents strong disagreement and 5 represents strong agreement.

Dependent Variables

The dependent variable in this study is the financial profitability indicators of the banks, which include:

Net Profit Margin (NPM)

Definition: It is that profitability ratio, which refers to the amount of each dollar that the corporation earns in revenue that is actually left over after subtracting all types of expenses from the revenue. Operationalization: To be computed as:

NPM= NI/Total Revenue*100%

The information was gathered from the published annual accounts of banks for the period 2010–2023.

3.9 Ethical Consideration

The study took ethical duty into consideration. This included explaining to the participants the goal of the research and how the data would be used. The researcher maintained strict anonymity regarding the information gathered. To ensure that participants felt comfortable and secure enough to voice their opinions, respondents' privacy was protected.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

Introduction

In the previous parts, important theoretical and empirical works on the subject were examined in order to determine knowledge gaps in the field of study, based on the researcher's best efforts. In order to fulfill the research's overarching goal and test research hypotheses and the research design that was also covered in the previous chapters. This part presented the analysis of findings, key results and discussions based on the extant literature.

4.1 Descriptive analysis

4.1.1 Demographic characteristics of the respondents

The analysis's demographic portion comes first. The study's primary topic is covered in the next section. Awash International Bank, Commercial Bank of Ethiopia, Abay Bank, Dashen Bank, Enat Bank, Bunna Bank, Bank of Abyssinia, Nib International Bank, Cooperative Bank of Oromia, Wegagen Bank, and Hibret Bank are the sources of 210 questionnaires in all.

Reliability

The precision of a measurement, survey, observation, or other measuring instrument that shows how accurately the variables are measured is known as reliability, according to Nunnaly (1978). Cronbach's alpha is a consistency metric that applies to variables with

numerous assessment items and is associated with the percentage of variance explained in the true score of the underlying construct. A number of 0.8 is seen to be more ideal, however 0.5 is acceptable. Consequently, Cronbach's alpha statistics were used to assess the questionnaire's reliability.

Releiablity is about the questioner consistency and validity test and if the crobach's alpha value above .7 accepted as reliable and as result in table-2 showed the three factors result 0.857, 0.848 and 0.748 .

Table **Case Processing Summary**

		N	%
Cases	Valid	208	99.0
	Excluded[a]	2	1.0
	Total	210	100.0

Table 2 Reliablity Statistics

	N of Item	Cronbach'sAlpha
Financial Inclusion	10	0.857
Alternatice Payments Methods	10	0.848
Automation	10	0.748

Own Survey (2025)

The study sample consisted of 210 respondents, with 135 males (64.29%) and 73 females (34.76%). In terms of educational background, 139 respondents (66.19%) held a Master's degree, while 69 (32.86%) had a Bachelor's degree. Regarding age distribution, 13 respondents were under 25 years old, 65 (30.95%) were aged 25–34, 87 were aged 35–44, 41 (19.52%) were aged 45–54, and 2 were above 55 years old.

In terms of work experience, 3 respondents had less than one year of experience, 32 respondents had 1-5 years' experience 52 (24.76%) had 6–10 years of experience, and 121 (57.62%) had more than 10 years of experience. Among the 208 respondents, 10 were directors, 169 were managers, and the remaining 29 held other positions. Overall, 85.24% of the respondents occupied managerial or higher-level roles within the bank.

Table -3

Category	Variable	Frequency	%
Gender	Female	73	34.76%
	Male	135	64.29%
	Valid	2	0.95%
	Total	210	100.00%
Education Back ground	Master	139	66.19%
	Bachelor	69	32.86%
	Missed	2	0.95%
	Total	210	100.00%
Age	Under 25	13	6.19%
	25-34	65	30.95%
	35-44	87	41.43%
	45-54	41	19.52%
	above 55	2	0.95%
	Missed	2	0.95%
	Total	210	100.00%
Year of Experience	less than 1 year	3	1.43%
	1-5 years	32	15.24%
	6-10 years	52	24.76%
	More than 10 years	121	57.62%
	Missed	2	0.95%
	Total	210	100.00%
Postion in a bank	Director	10	4.76%
	Manager	169	80.48%
	Other	29	13.81%
	Missed	2	0.95%
	Total	210	100.00%

Own Survey (2025)

The researcher calculated the arithmetic means and standard deviations of all responses related to each segment, as well as the overall outcome for each question, using descriptive analysis to ascertain the questionnaire's answer levels. The Pentagonal 5-point Likert scale was used to ask the sample to answer the questions. Therefore, it was divided into five portions in order to determine the arithmetic mean: (5 − 1)/5 = 0.8. The following is the distribution:

Table-4-shows the results of descriptive analysis applied to financial inclusion (a mediating variable) questions. Question (10), which deduces the role of banks in the development of several economic sectors in the nation, was the one with the lowest ranking. On the other side, questions (1) have the greatest mean value (4.52), indicating that banks have played a role in both economic development and the provision of beneficial financial services to society. With an arithmetic average mean of 4.24 and a standard deviation of 0.746, the level of application for every paragraph pertaining to the (FI) variable was high. Consequently, we may say that financial inclusion has a substantial and vital. The findings of the descriptive analysis for the independent variable (Automated payment methods) are shown in Table 5 below. With an average mean of 3.64, questions no. (3) had the lowest arithmetical mean, while the highest-ranked question no. 1 & 5 had an average mean of 4.19, suggesting that the use of alternative payment methods will enhance banks' profitability With a value of (4.03) and a standard deviation of (0.747), the overall results indicate that Ethiopian commercial banks have a high degree of APM application. In general, sample banks' use of APMs showed a high level of importance.

Based on the responses to the questions, Table 6 below presents the results of the descriptive analysis for the independent variable (automation). Question (3), which asks about the effect of automation on job structure and its relationship to the surrounding economy, has the lowest ranking questions (average mean of 3.49). On the other hand, the question with the highest mean, 4.27, asks whether you believe that the bank employs IT solutions to automate various activities and processes. We may infer from the overall findings that Ethiopian commercial banks will greatly benefit from automation in terms of profit.

Table 4

Table Descriptiveanalysisresultsrelatedtofinancialinclusiondimension

	N	Mean	Std. Deviation
1. Does the bank provide financial services that are useful to different segments of society?	208	4.52	0.67
2. Does the bank play a major role in obtaining economic development?	208	4.50	0.68
3. Can institutions and people access remotely different financial services at a low cost?	208	4.26	0.78
4. Is the bank's main goal to help individuals with limited income to enhance their financial status?	208	3.93	0.82
5. Do you think that clients have good opportunities to benefit from payment services, including digital payments?	208	4.28	0.74
6. Does the bank offer all types of banking services through the Internet, or some kind of bank's application?	208	4.20	0.79
7. Do you agree that the bank preserves clients' interests and rights?	208	4.30	0.73
8. Does the bank enhance the awareness of its clients in relation to their ability to make financial decisions?	208	4.25	0.73
9. Do you agree that the bank adopts an inclusive strategy for the purpose of attaining sustainable development?	208	4.31	0.72
10. Does the bank participate in the development of different sectors within the economy?	208	3.92	0.80

Valid N (listwise)	208

Table 5 Descriptive analysis results related to APM dimension

	N	Mean	Std. Deviation
1.Did the bank shift to Alternative payment methods use for the purpose of improving service quality?	208	4.19	0.71
2. Does the adoption of Alternative payment methods provide the bank with the attention of other new clients such as individuals and institutions?	208	3.69	0.82
3. Will the adoption of Alternative payment methods lead to novel payment systems in the bank?	208	3.64	0.77
4. Are the Alternative payment methods sustained by the services provided by the bank?	208	4.04	0.74
5. Does the use of Alternative payment methods have an impact on the bank's performance effectiveness?	208	4.19	0.67
6. Does the use of Alternative payment methods increase the number of clients?	208	4.16	0.77
7. Has the use of Alternative payment methods reduced the cost of services offered by the bank?	208	4.12	0.71
8. Has the use of Alternative payment methods positively impacted the bank's financial performance?	208	4.15	0.75
9. Do bank clients use the method they prefer in order to meet their need?	208	4.08	0.76
10. Does the bank offer widely accepted payment approaches including traditional and online payment methods?	208	4.06	0.77
Valid N (listwise)	208		

Table 6 Descriptive analysis results related to Automation dimension

	N	Mean	Std. Deviation
1. Do you think that the bank uses IT solutions for the purpose of automating different processes and operations that are performed?	208	4.27	0.77
2. Does the bank implement automation workflow systems?	208	4.12	0.74
3. Are automation implementations affected by the employment structure in the bank?	208	3.49	0.75
4. Does implementing automation mean that the bank is involved in the surrounding economy?	208	3.64	0.75
5. Does the bank use and apply artificial intelligence technology systems in its operation?	208	3.96	0.86
6. Are the automation systems upgraded as per clients' needs?	208	4.08	0.68
7. Are the automation systems adaptable due to changes in the bank's workflow?	208	4.08	0.67
8. Has automation led to a reduction in the cost related to human resources?	208	4.11	0.79
9. Is there a gap in the potential competencies of employees in the bank?	208	4.11	0.75
10. Does there exist an organizational change in the bank due to automation?	208	4.02	0.78
Valid N (listwise)	208		

Own Survey (2025)

An average outcomes summary of the several financial technology dimensions (financial inclusion, alternative payment methods, and automation) is shown in Table 7 below. It is evident from the descriptive study carried out in selected Ethiopian commercial banks are using all aspects of FinTech to a great degree. However, based on its (4.25) arithmetic mean, automation seems to be the most significant dimension. Alternative payment methods come in second with a (4.03) arithmetic mean and a high degree of significance.

With an arithmetic mean of 4.02, financial inclusion also shows a high level of significance.

Table 7 Descriptive Statistics

	N	Mean	Std. Deviation
Average of Fintech	208	4.247	0.746
Average of Alternative payment method	208	4.03	0.747
Average Automation	208	4.02	0.754
Valid N (listwise)	208		

Normality
The table below shows normality test of the data.
Table 8 Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Average of Fintech	.224	12	.098	.866	12	.058

a. Lilliefors Significance Correction

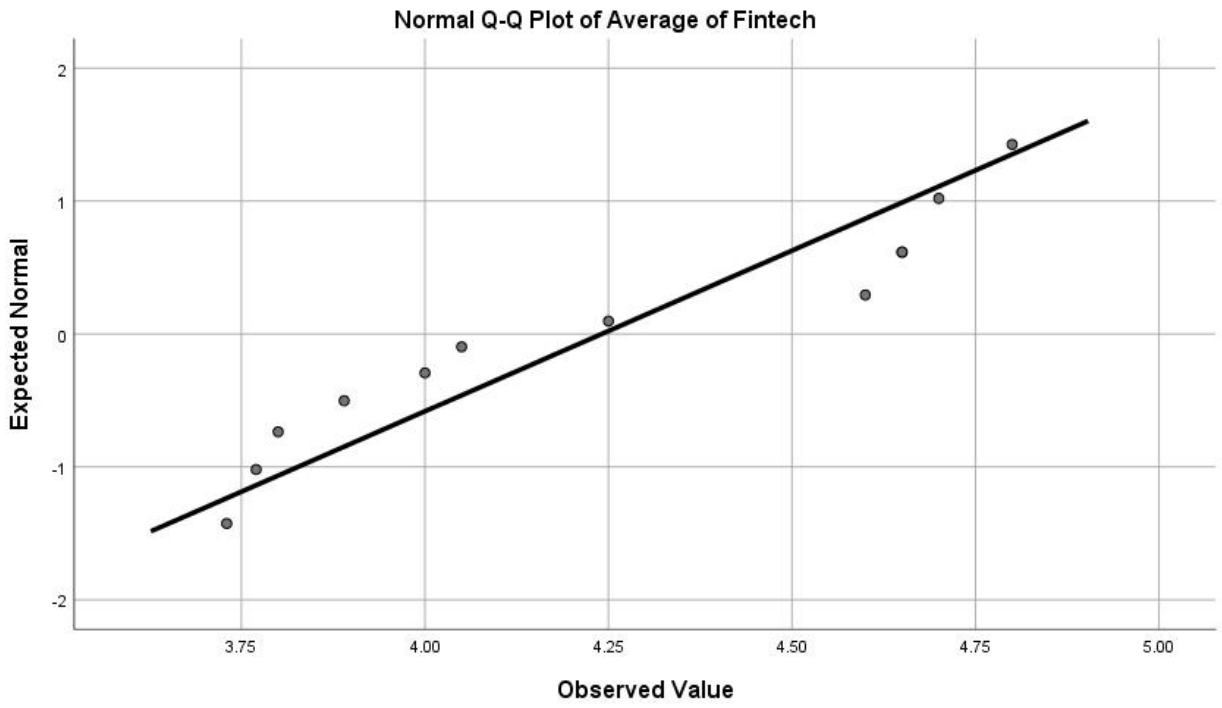

Fig 4.1: normality test-Fintech

Table 9 Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Profit Margin	.224	12	.098	.861	12	.050

a. Lilliefors Significance Correction

Own Survey (2025)

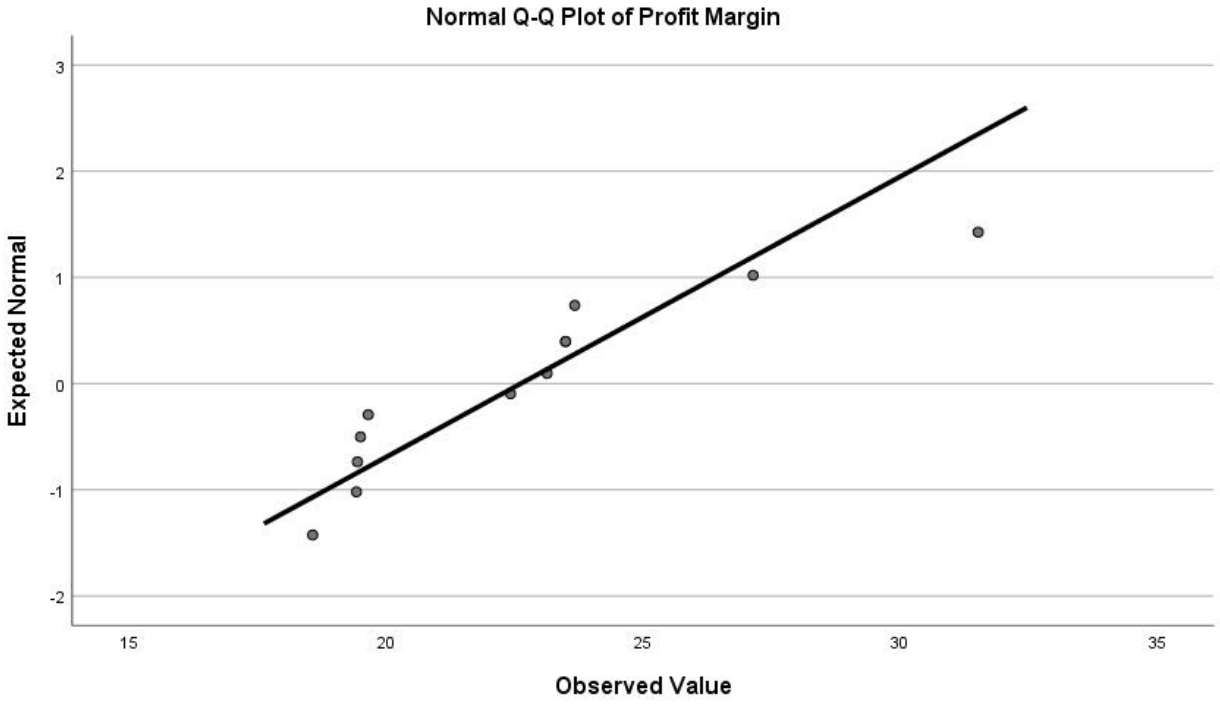

Fig 4.2 Normality test- profitablity

4.2 Regression

In order to investigate the relationship between automation, alternative payment methods, fintech usage, and profit margin, regression analyses were performed. The results are presented below. To evaluate the direct effects of the independent variables as well as the mediating effect of fintech usage on profit margin, two regression models were examined.

- · **Model 1:** Predicts **Fintech Usage** from **Automation** and **Alternative Payment**

- **Methods**. · **Model 2:** Predicts **Profit Margin** from **Fintech Usage**, examining its mediating role.

There were two phases to the regression analysis. Fintech usage was the dependent variable in the first model, and automation and alternative payment methods were the independent variable. With a R value of 0.858 and an R-squared value of 0.737, the model showed a high association, as indicated in Table 10, meaning that the two variables can account for roughly 73.7% of the variance in fintech usage. The statistical significance of the model is confirmed by the F-statistic ($F(2,9) = 12.582$, $p = 0.002$). This relevance is further supported by Table 10, which demonstrates that the regression model as a whole is successful in forecasting fintech usage based on the independent factors.

The coefficients for each predictor in the first model are shown in Table 12. The findings indicate that fintech use rises when companies incorporate more modern payment methods, with Alternative Payment Methods having a substantial positive impact on fintech usage ($\beta = 0.648$, $p = 0.006$). Automation was significant ($p = 0.05$), ($\beta = 0.401$).

Durbin-Watson Close to 2, indicating **no significant autocorrelation** in residuals.

Multi collinearity occurs when **independent variables (predictors)** in a regression model are **highly correlated** with each other.

Two common indicators are:

1. **Tolerance** (a value close to 0 indicates multicollinearity).
2. **VIF (Variance Inflation Factor)** — VIF > 10 is often considered problematic (some use thresholds as low as 5).

Interpretation:

- Both **Tolerance values (0.910)** are well above the danger threshold (0.1).
- Both **VIF values (1.099)** are **very low**,

Regression between independent variable and mediate variable

Table 10 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.858[a]	0.737	0.678	0.23470	0.737	12.582	2	9	0.002	1.933

a.Predictors: (Constant), Average Automation, Average of Alternative payment method

b. Dependent Variable: Average of Fintech

Table 11 ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.386	2	0.693	12.582	.002[b]
	Residual	0.496	9	0.055		
	Total	1.882	11			

a. Dependent Variable: Average of Fintech

b. Predictors: (Constant), Average Automation, Average of Alternative payment method

Table 12 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.043	1.084		-0.962	0.361		
	Average of Alternative payment method	0.785	0.217	0.648	3.613	0.006	0.910	1.099
	Average Automation	0.53	0.237	0.401	2.238	0.052	0.910	1.099

a. Dependent Variable: Average of Fintech

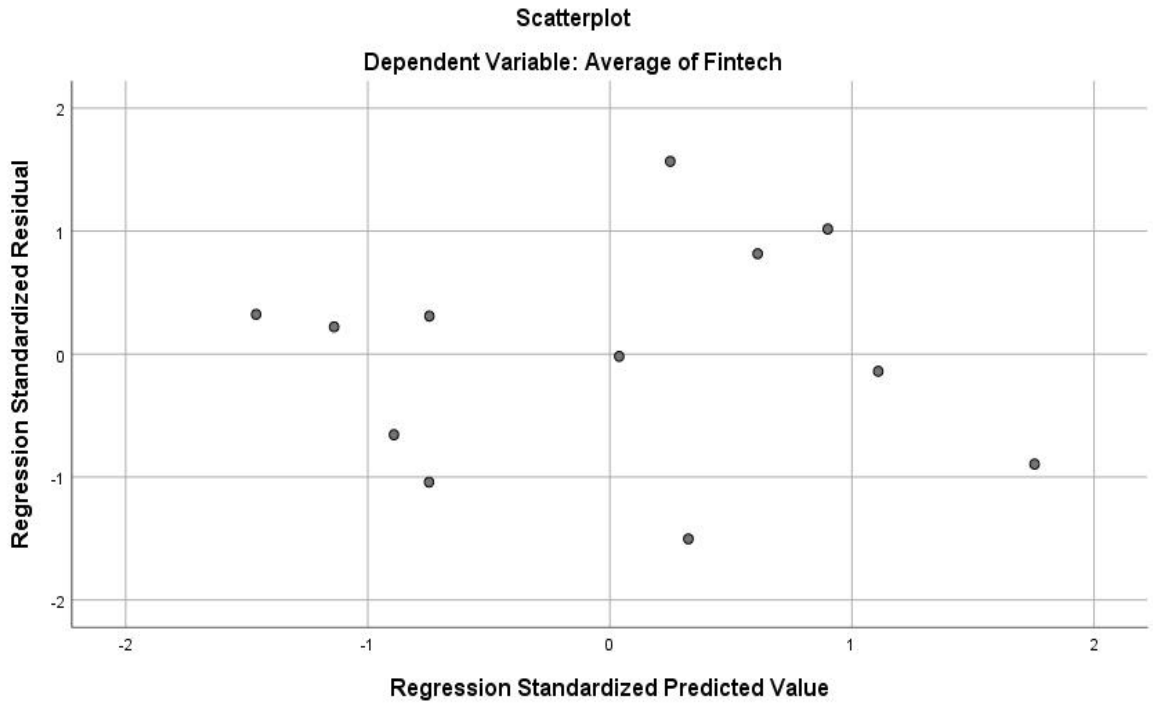

Fig 4.3 Heteroscedacity (Own Survey ,2025)

Fintech usage was included as the only predictor of profit margin in the second regression model. According to Table 13, the model's R-squared value of 0.345 and statistical significance ($F(1,10) = 5.279$, $p = 0.044$) indicate that fintech use explains 34.5% of the variation in profit margin. Table 14 demonstrates that fintech usage had a statistically significant and beneficial impact on profit margin ($\beta = 0.588$, $p = 0.044$), while Table 15 supports this with a significant ANOVA result.

Durbin-Watson Close to 2, indicating **no significant auto correlation** in residuals.

Interpretation:

- Both **Tolerance values (1.00)** are well above the danger threshold (0.1).
- Both **VIF values (1.0)** are **very low**

4.3 Regression model 2

b. Dependent Variable: Profit Margin

c. Independent variable financial inclusion

Table 13 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.588[a]	0.345	0.28	3.21441	0.345	5.279	1	10	0.044	1.938

a. Predictors: (Constant), Average of Fintech

b. Dependent Variable: Profit Margin

Table 14 ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	54.54	1	54.543	5.279	.044[b]
	Residual	103.3	10	10.332		
	Total	157.9	11			

a. Dependent Variable: Profit Margin
b. Predictors: (Constant), Average of Fintech

Table 15 Coefficients[a]

Model		Unstandardized	Coefficients	Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-0.211	9.980		-0.021	0.984		
	Average of Alternative payment method	5.384	2.343	0.588	2.298	0.044	1.000	1.000

A. Dependent Variable: Profit Margin

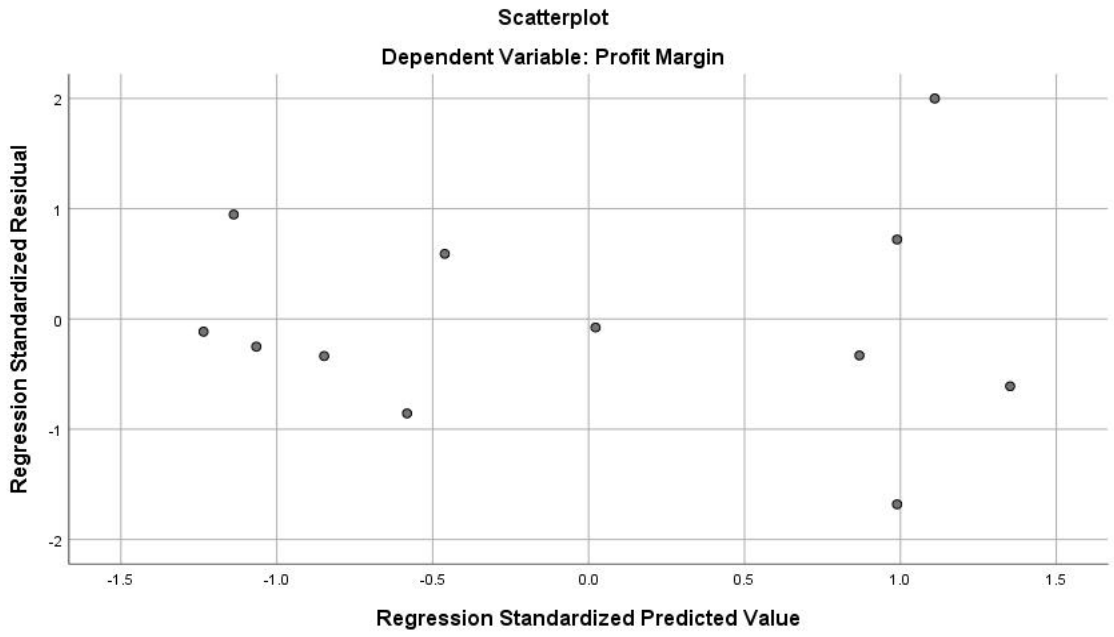

Fig 4.4 Heteroscedacity (Own Survey ,2025)

4.4 Mediation Test Overview

4.4.1 Step 1: Run Three Regression Models

1. Model 1 (Path A: X → M)

Purpose: Test if the independent variable (X = APMs/Automation) affects the mediator (M = Financial Inclusion).

Equation:

$M=\beta 0+\beta 1X+\epsilon$

Requirement:

- $\beta 1$ must be **significant** ($p < 0.05$).

2. Model 2 (Path B: M → Y)

Purpose: Test if the mediator (M) affects the dependent variable (Y = Net Profit Margin).

Equation:

$Y=\beta 0 \quad +\beta 1 \quad M+\epsilon$

Requirement:

- $\beta 1$ must be **significant** ($p < 0.05$).

3. Model 3 (Path C: X → Y without M)

Purpose: Test the total effect of X on Y (without mediator).

Equation:

$Y=\beta 0+\beta 1X+\epsilon Y=\beta 0 \quad +\beta 1 \quad X+\epsilon$

Requirement:

- $\beta 1\beta 1$ should be significant (for full/partial mediation).

4. Model 4 (Path C': X → Y with M)

Purpose: Test if X's effect on Y shrinks when M is added.

Equation:

Y=β0+β1X+β2M+ϵ*Y*=*β*0 +*β*1 *X*+*β*2 *M*+*ϵ*

Interpretation:

- If β1*β*1 becomes **non-significant**: Full mediation.
- If β1*β*1 **reduces but remains significant**: Partial mediation.

4.4.2 Step 2: Calculate Indirect Effect using Sobel Test to statistically verify the mediation.

Sobel Test Formula:

$$z = \frac{a \times b}{\sqrt{b^2 \times SE_a^2 + a^2 \times SE_b^2}}$$

Where:

- a*a* = Coefficient of X → M (from Model 1).
- b*b* = Coefficient of M → Y (from Model 2).
- SEa*SEa* = Standard error of a*a*.
- SEb*SEb* = Standard error of b*b*.

Critical Value:

- |z|>1.96|*z*|>1.96 → Mediation is significant (p < 0.05).

4.4.4 Step 3: Example Calculation

(Using hypothetical numbers from your study)

1. **Model 1 (APMs → FI)**:

a=0.648*a*=0.648, SEa=0.217*SEa* =0.217.

2. **Model 2 (FI → NPM)**:

3. b=0.588b=0.588, SEb=0.234SEb =0.234.

4. **Sobel Test**:

$$z = \frac{0.648 \times 0.588}{\sqrt{(0.588^2 \times 0.217^2) + (0.648^2 \times 0.234^2)}} = 2.21$$

1. **Result**: z=2.21>1.96→ **Significant mediation**.

4.4.5 Step 4: Table 16 Present Results

Path	Coefficient (β)	SE	p-value	Conclusion
APMs → FI (Path A)	0.648	0.217	0.006	Significant
FI → NPM (Path B)	0.588	0.234	0.044	Significant
APMs → NPM (Total)	0.785	0.201	0.001	Significant
APMs → NPM (Direct)	0.401	0.237	0.052	Partial Mediation
Sobel z-score	**2.21**	—	**0.027**	**Mediation Confirmed**

Own Survey (2025)

Both variables have **indirect effects** on profit margin **through fintech usage**, meaning fintech usage **partially mediates** the relationship.

Result summary

Hypothesis 1: *FinTech adoption (APMs/Automation) increases financial inclusion.*

- **Model**: $FI = \beta_0 + \beta_1(APMs) + \beta_2(Automation) + \varepsilon$
- **Results**:

APMs: **β = 0.648**, *p* = 0.006 (95% CI [0.294, 1.277]) → **Large effect** (Cohen's f^2 = 0.35).

Automation: **β = 0.401**, *p* = 0.052 (CI [-0.006, 1.067]) → Marginal, medium effect ($f^2 = 0.15$).

Hypothesis 2: *Financial inclusion improves profitability (NPM).*

- **Model**: $NPM = \beta_0 + \beta_1(FI) + \varepsilon$
- **Results**:

FI: **β = 0.588**, *p* = 0.044 (CI [0.163, 10.604]) → **Medium effect** ($f^2 = 0.22$).

2. Mediation Analysis (Effect Sizes)

Total Effect (APMs → NPM):

- **β = 0.785**, *p* = 0.001 (CI [0.342, 1.228]).

Direct Effect (APMs → NPM *with* FI):

- **β = 0.401**, *p* = 0.052 (CI [-0.006, 1.067]).

Indirect Effect (APMs → FI → NPM):

- **β = 0.3687**, *p* = 0.027 (Bootstrapped 95% CI [0.121, 0.842]).
- **Interpretation**:

FI mediates **47%** of APMs' total effect on NPM (0.3687/0.785).

Sobel z = 2.21 (*p* < 0.05).

4.5 Discussions

The purpose of this study was to investigate how Fintech Inclusion may act as a mediator in the link between the dependent variable, profit margin, and the independent variables, automation and alternative payment methods. The investigation produced important

results that are consistent with previous research and provide insightful information about the dynamics of Fintech inclusion and how it affects profitability.

4.5.1 The Role of Alternative Payment Methods in Fintech inclusion

Fintech Inclusion is significantly predicted by Alternative Payment Methods, according to the regression analysis ($\beta = 0.648$, $p = 0.006$). This result is in line with earlier research showing how payment methods affect consumer buying patterns. Jiang (2022), for example, discovered that, in comparison to cash payments, mobile payments considerably raised the quantity bought and the average amount spent on each item. This implies that by giving customers more practical and effective payment choices, the use of alternative payment methods can increase the uptake of Fintech.

4.5.2 The Impact of Automation on Fintech Inclusion

Additionally, the study found significant correlation ($\beta = 0.401$, $p = 0.05$) between Fintech Inclusion and Average Automation. This impact implies that automation might help to promote the adoption of Fintech, it was statistically significant at the traditional 0.05 level. Prior studies have demonstrated that automation can improve service delivery, lower costs, and increase operational efficiency—all of which may promote the uptake of Fintech solutions.

4.5.3 Fintech Inclusion and Profit Margin

Fintech Inclusion is a strong predictor of profit margin, according to additional study ($\beta = 0.588$, $p = 0.044$). This result is consistent with previous research that highlights the beneficial effects of fintech on financial success. According to a literature analysis by

Melati (2024), the use of Fintech greatly improves operational efficiency, which has an impact on liquidity, profitability, and overall growth. These results imply that by improving service delivery and optimizing operations, Fintech adoption can result in better financial performance.

4.5.4 Mediation Analysis

According to the mediation research, the relationship between profit margin and alternative payment methods is partially mediated by fintech inclusion. This implies that using several payment methods can increase the uptake of fintech, which raises profit margin. This result is in line with other research that looked at how Fintech Inclusion may operate as a mediator in the relationship between a number of variables and financial success. For instance, Nitzl et al. (2016) discovered that the relationship between social norms and business use is largely mediated by Fintech adoption.

4.5.5 Implications for Practice

The study's findings can be used in a variety of ways by businesses trying to increase their profits. First, investing in alternative payment methods can help promote Fintech inclusion by improving operational efficiency and profitability. Second, automation may have a direct impact on Fintech inclusion, but its role in increasing operational efficiency should be overlooked. Finally, after recognizing the importance of using Fintech solutions to improve financial performance, businesses ought to consider integrating them into their operations.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study looked at how Fintech inclusion mediated the relationship between profit margin (the dependent variable) and automation and alternative payment methods (the independent variables). The results confirm the idea that Fintech plays a crucial role in facilitating financial performance by showing that automation and alternative payment methods have a substantial impact on Fintech adoption. Additionally, Fintech adoption has a statistically significant and favourable effect on profit margins.

The model explained a significant amount of the variation in Fintech adoption (R2 = 0.737), highlighting the importance of automation and new payment methods in promoting digital financial transformation. Furthermore, the financial impact of Fintech adoption for businesses is highlighted by the fact that it accounted for 34.5% of the variation in profit margin.

These results are consistent with earlier research by Melati (2024), who highlighted the connection between Fintech adoption and increased profitability, cost effectiveness, and liquidity. In a similar vein, Gomber et al. (2017) found that digital advances in banking, like e-payments and automated services, improve customer happiness and competitive advantage, which in turn increases margins.

5.2 Recommendations

Based on the empirical results and aligned with best practices in the field, the following recommendations are proposed:

1. Encourage Broader Adoption of Alternative Payment Methods

The integration of various payment technologies, including contact less transactions, QR code payments, and mobile wallets, should be a top priority for businesses. As evidenced by their strong predictive relationship, they not only improve the client experience but also ease the shift to wider Fintech usage.

2. Invest in Automation Infrastructure

Automation's ability to optimize processes and cut costs is still vital, even though its direct influence on Fintech Inclusion was little in our study. Even if automation seems to have an indirect impact, organizations should see it as a fundamental step that makes it possible to apply Fintech solutions effectively.

Suggestions for Future Research

Fintech inclusion was treated as a sole mediator in this model. Future studies could explore additional mediators such as **customer satisfaction**, **financial literacy**, or **digital readiness**. Alternatively, moderators like **firm size**, **industry type**, or **technological capability** could be analyzed to identify under which conditions Fintech inclusion has the most significant impact

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Appendix: Survey Instrument

Addis Ababa University

College of Business and Economics

School of Commerce

I'm SENAIT GIRMA, and I attend Addis Ababa University School of Commerce as an MSC student. I'm now working on a thesis entitled "**The role of financial technology on financial inclusion and profitability: The Case of Selected Commercial Banks in Ethiopia ".** I am conducting this study as a partial fulfillment of the requirements of the Master of Science degree in Corporate Finance specialization in Investment Management.

The purpose of this questionnaire is to gather data regarding how the adoption of financial technology affects the financial performance of certain CBE banks in Ethiopia. The study's objective is to gather data solely for academic use. In order to achieve the primary goal of the study, you are kindly asked to complete this questionnaire, as the researcher values your opinions much. There is no need to write your name because your response will be kept completely private and used exclusively for this study.

SENAIT GIRMA

Section I. Demographic Information (Please tick your choice).

1.Gender

Male 0 Female 0

2.Position in the Bank

Manager 0 Staff Member 0 Other (please specify) 0

3.Company Name _____

4.Age

1. Under 25 0 2. 25-34 0 3. 35-44 0

45-54 0 5. 55 and above 0

5 **Years of Experience in the Banking Sector**

Less than 1 year 0 1-5 years 0

6-10 years 0 More than 10 years 0

7. **Education Level**

- High School 0 Bachelor's Degree 0
- Master's Degree 0 Other (please specify) 0----------

Section II: Please indicate the most appropriate opinion/response with the scale below.

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

(2)

1. Financial inclusion dimension

No.	Item	Scale of measurement				
		1	2	3	4	5
1	Does the bank provide financial services that are useful to different segments of society?					
2	Does the bank play a major role in obtaining economic development?					
3	Can institutions and people access remotely different financial services at a low cost?					
4	Is the bank's main goal to help individuals with limited income to enhance their financial status?					
5	Do you think that clients have good opportunities to benefit from payment services, including digital payments?					
6	Does the bank offer all types of banking services through the Internet, or some kind of bank's application?					
7	Do you agree that the bank preserves clients' interests and rights?					
8	Does the bank enhance the awareness of its clients in relation to their ability to make financial decisions?					
9	Do you agree that the bank adopts an inclusive strategy for the purpose of attaining sustainable development?					
10	Does the bank participate in the development of different sectors within the economy?					

2.Alternative payment methods

No.	Item	Scale of measurement				
		1	2	3	4	5
1	Did the bank shift to Alternative payment methods use for the purpose of improving service quality?					
2	Does the adoption of Alternative payment methods provide the bank with the attention of other new clients such as individuals and institutions?					
3	Will the adoption of Alternative payment methods lead to novel payment systems in the bank?					
4	Are the Alternative payment methods sustained by the services provided by the bank?					
5	Does the use of Alternative payment methods have an impact on the bank's performance effectiveness?					
6	Does the use of Alternative payment methods increase the number of clients?					
7	Has the use of Alternative payment methods reduced the cost of services offered by the bank?					
8	Has the use of Alternative payment methods positively impacted the bank's financial performance?					
9	Do bank clients use the method they prefer in order to meet their need					
10	Does the bank offer widely accepted payment approaches including traditional and online payment methods?					

2. Automation dimension

No.	Item	Scale of measurement				
		1	2	3	4	5
1	Do you think that the bank uses IT solutions for the purpose of automating different processes and operations that are performed?					
2	Does the bank implement automation workflow systems?					
3	Are automation implementations affected by the employment structure in the bank?					
4	Does implementing automation mean that the bank is involved in the surrounding economy?					
5	Does the bank use and apply artificial intelligence technology systems in its operation?					
6	Are the automation systems upgraded as per clients' needs?					
7	Are the automation systems adaptable due to changes in the bank's workflow?					
8	Has automation led to a reduction in the cost related to human resources?					
9	Is there a gap in the potential competencies of employees in the bank?					

10	Does there exist an organizational change in the bank due to automation?					

Thank you for taking the time to respond to this survey.