



Addis Ababa University
College of Business and Economics
Department of Business Administration

**The Impact of Digitalization on Bank Profitability:
The Case of selected Commercial Banks in Ethiopia**

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Business Administration in Finance**

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STATEMENT OF DECLARATION

I, Alhamdu Abdela, hereby declare that the thesis entitled “*The Impact of Digitalization on the Profitability of Selected Commercial Banks in Ethiopia*” is my original work and that all the sources and materials used for the study have been duly accredited. This research has not been used for any degree in this or any other university. It is provided for the partial accomplishment of the requirement for the MBA in Finance at College of Business and Economics Department of Business Administration, Addis Ababa University.

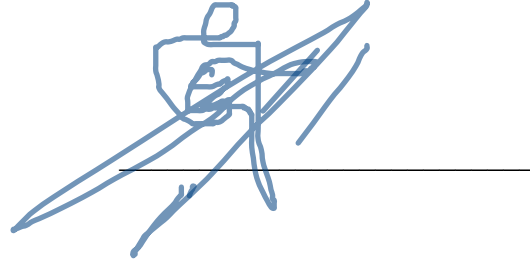
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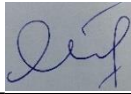


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Table of Contents

STATEMENT OF DECLARATION	ii
STATEMENT OF CERTIFICATION	iii
ACKNOWLEDGEMENTS.....	v
List of Table.....	ix
List of Figure	x
Abstract.....	xi
CHAPTER ONE.....	1
1. INTRODUCTION	1
1.1. Background of the Study	1
1.2. Statement of the Problem	2
1.3. Research Questions	4
1.3.1. Main Research Question	4
1.3.2. Specific Research Questions	4
1.4. Objective of the Study	4
1.4.1. General Objective.....	4
1.4.2. Specific Objectives.....	4
1.5. Research Hypothesis	5
1.6. Significance of the Study.....	5
1.7. Delimitation/Scope of the Study	6
1.8. Organization of the Paper	7
1.9. Definition of Key Terms	7
CHAPTER TWO	9
2. Literature review.....	9
2.1. Theoretical Review.....	9
2.1.1. Impacts of Digitalization on Bank Profitability and Performance	9
2.1.2. Digital Banking	10
2.1.3. Definition of Important Terms and Concepts	10
2.1.4. The Application of Digitalization in Business	12
2.1.5. Banking practice in Ethiopia	15
2.1.6. Digital Banking practice in Ethiopia.....	16
2.1.7. Digital Banking Types	19

2.1.8. Determinants of Financial Performance.....	20
2.1.9. Digital Banking and Financial Performance	22
2.1.10. Banks performance measurement	23
2.2. Empirical Review	24
2.2.1. Related Empirical Studies	24
2.2.2. Related Empirical Studies in Ethiopia	26
2.3. Research Gaps	29
2.4. Variables in the Study	30
2.4.1. Digital Banking and Service Quality	32
2.4.2. Digital Banking and Service Excellency.....	33
2.5. Conceptual Framework	34
CHAPTER THREE	36
3. RESEARCH DESIGN & METHODOLOGY	36
3.1. Research Design	36
3.2. Population of the study and Sampling Technique	37
3.2.1. Target Population	37
3.2.2. Sample Size Determination.....	37
3.2.3. Sampling Techniques	38
3.3. Source and Types of Data.....	39
3.4. Methods of Data Collection.....	40
3.5. Methods of Data Analysis	40
3.6. Model Specification.....	40
3.7. Instrument validation and reliability	42
3.7.1. Validity	42
3.7.2. Reliability	42
3.8. Ethical Consideration	43
CHAPTER FOUR	44
4. DATA ANALYSIS, RESULTS AND INTERPRETATION	44
4.1. Profile of Respondents	44
4.2. Descriptive.....	46
4.2.1. Descriptive Statistics for ATM Transactions	46
4.2.2. Descriptive Statistics for Mobile Banking Transactions.....	47

4.2.3. Descriptive Statistics for Internet Banking Transactions	48
4.2.4. Descriptive Statistics for service excellence in Banking	50
4.2.5. Descriptive Statistics for Digitalization and Profitability	51
4.3. Correlation Analysis	52
4.4. Multiple Linear Regression Analysis	54
4.4.1. Multi Collinearity	54
4.4.2. Normality	55
4.4.3. Linearity	56
4.4.4. Homoscedasticity	57
4.5. Model Summary for Profitability of Commercial Banks	58
4.6. ANOVA for Profitability of Commercial Banks.....	59
4.7. Coefficients for Predictors of Profitability	60
4.8. Hypotheses Testing.....	61
4.8.1. Related Studies and Findings	61
CHAPTER FIVE	63
5. SUMMARY, CONCLUSION AND RECOMMENDATION.....	63
5.1. Summary of the Study	63
5.2. Conclusion	64
5.3. Recommendations	65
5.4. Future Research Directions	67
References.....	69
Appendix I	77

List of Table

Table 1: Sample Frame.....	39
Table 2: Reliability Statistics.....	42
Table 3: Respondents Profile.....	44
Table 4: Digital Banking Services/Products Provided	45
Table 5: Descriptive Statistics for ATM Transactions	46
Table 6: Descriptive Statistics for Mobile Banking Transactions	47
Table 7: Descriptive Statistics for Internet Banking Transactions	49
Table 8: Descriptive Statistics for service excellence in Banking.....	50
Table 9: Descriptive Statistics for Digitalization and Profitability	51
Table 10: Correlation Analysis of Variables	52
Table 11: Collinearity Statistics for Predictors of Profitability	54
Table 12: Model Summary for Profitability of Commercial Banks.....	58
Table 13: ANOVA Summary for Profitability of Commercial Banks.....	59
Table 14: Coefficients for Predictors of Profitability.....	60
Table 15: Hypotheses testing.....	61

List of Figure

Figure 1: Conceptual Framework.....	35
Figure 2: Normality test.....	55
Figure 3: Linearity test	56
Figure 4: Homoscedasticity test	57

Abstract

The banking sector in Ethiopia is undergoing significant transformation due to the increasing adoption of digital banking services. This thesis investigates the impact of digitalization on the profitability of selected commercial banks in Ethiopia, focusing on key factors such as Automated Teller Machine (ATM) transactions, mobile banking, internet banking, and service excellence. A quantitative research design was employed, utilizing survey data collected from 274 respondents across five major commercial banks: Commercial Bank of Ethiopia, Awash Bank, Dashen Bank, Bank of Abyssinia, and Zemen Bank. The findings reveal that all forms of digital banking services significantly contribute to the profitability of commercial banks. ATM transactions demonstrate the strongest positive correlation with profitability, supported by a p-value of 0.000, indicating high statistical significance. Mobile banking transactions also exhibit a significant positive effect on profitability, with a p-value of 0.002, while internet banking shows a similar trend with a p value of 0.005. Furthermore, the study highlights that digitalization enhances operational excellence and service quality, which positively influence bank profitability, with p-values of 0.004 for both factors. These factors collectively contribute to the financial performance of commercial banks, as measured by Return on Assets (ROA) and Return on Equity (ROE). By leveraging digital technologies, Ethiopian banks can achieve greater operational efficiency, improved service quality, and enhanced profitability in an increasingly competitive financial landscape. The results provide valuable insights for bank management and policymakers, emphasizing the need for continued investment in digital technologies to maintain competitiveness and drive profitability. Future research could explore longitudinal studies tracking the adoption and impact of digital banking services over time, investigate emerging technologies such as artificial intelligence and block-chain, and examine customer experience and satisfaction with digital banking services.

Keywords: *Digitalization, Commercial Banks, Profitability, Digital Banking, ATM Transactions, Mobile Banking, Internet Banking, Service Excellence.*

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

The banking sector in Ethiopia has undergone significant transformations in recent years, particularly with the advent of digital banking services. Digital banking, which encompasses a range of electronic financial services including Automated Teller Machines (ATMs), mobile banking, and internet banking, has emerged as a critical component in enhancing the efficiency and profitability of commercial banks. The introduction of e-banking in Ethiopia dates back to 2001 when the Commercial Bank of Ethiopia (CBE) launched its ATM services, marking the beginning of a gradual shift towards electronic financial transactions (Ayana, 2014). Since then, various private banks have followed suit, implementing diverse digital banking solutions to cater to an increasingly tech-savvy customer base.

Despite the progress made, the Ethiopian banking sector still faces numerous challenges that hinder the full realization of digital banking's potential. A study by (Worku, 2010) identified several barriers, including inadequate telecommunication infrastructure, low internet penetration rates, and a lack of suitable legal frameworks for digital transactions. These obstacles are compounded by high levels of illiteracy and limited access to technology among the population, which restricts the effective utilization of digital banking services (Gardachew, 2010). Furthermore, political instability in neighboring countries has created an uncertain environment that affects investor confidence and the overall stability of financial operations within Ethiopia (Worku, 2010).

The significance of digital banking in promoting financial inclusion cannot be overstated. According to a report by the National Bank of Ethiopia (National Bank of Ethiopia, 2016/2017), there is a growing recognition that digital financial services can bridge gaps in access to banking for underserved populations. The launch of initiatives such as a national switch service aims to enhance interoperability among banks and facilitate smoother transactions across different platforms (Ethiopia-Country Commercial Guide. Financial services: Digital banking in Ethiopia. , 2021). This is crucial for integrating rural populations into the formal financial system and fostering economic growth.

Moreover, the competitive landscape in Ethiopia's banking sector is evolving rapidly due to technological advancements. As noted by Dr. Desalegne from the Ethiopian Civil Service University, digital technology has transformed operational efficiencies within financial institutions, leading to reduced costs and increased returns on equity (Desalegne, 2024). This underscores the necessity for banks to not only adopt digital solutions but also innovate continuously to meet customer expectations and remain competitive.

Given these dynamics, this study aims to explore the impact of digitalization on the profitability of commercial banks in Ethiopia. By analyzing various digital banking services and their influence on bank performance metrics such as Return on Assets (ROA) and Return on Equity (ROE), this research seeks to contribute valuable insights into how Ethiopian banks can leverage technology to enhance their profitability while addressing existing challenges. The findings will provide a framework for understanding the relationship between digital banking practices and financial performance, ultimately guiding strategic decisions for stakeholders in the Ethiopian banking sector.

This study is timely and relevant as it aligns with global trends emphasizing the importance of digital transformation in financial services. As banks worldwide increasingly rely on technology to drive growth and improve customer experiences, understanding these trends within the Ethiopian context will be essential for shaping future policies and practices in the industry.

1.2. Statement of the Problem

The banking sector in Ethiopia is at a critical juncture, facing both significant opportunities and formidable challenges in the realm of digital banking. Despite the rapid advancements in technology and the increasing adoption of electronic banking services globally, Ethiopian banks continue to grapple with low levels of digital banking penetration. As of 2015, only 746,050 out of 16.52 million bank account holders utilized e-banking services, reflecting a mere 4.5% adoption rate (National Bank of Ethiopia (NBE), 2015). This underutilization of digital banking channels not only limits financial inclusion but also adversely impacts the profitability of commercial banks, which are essential for economic growth and stability in the country.

A notable gap exists in the literature regarding the specific effects of digital banking on bank performance in Ethiopia. While several studies have highlighted the benefits of electronic banking in enhancing operational efficiency and customer satisfaction ((Worku, 2010); (Ayana, 2014)), there is limited empirical evidence examining how these digital services directly influence profitability metrics such as Return on Assets (ROA) and Return on Equity (ROE) within the Ethiopian context. Furthermore, existing research has often focused on individual aspects of digital banking without providing a comprehensive analysis that encompasses various digital channels and their collective impact on financial performance.

The challenges hindering the effective implementation of digital banking in Ethiopia are multifaceted. They include inadequate telecommunications infrastructure, low internet penetration rates, high costs associated with internet access, and a lack of regulatory frameworks that support digital transactions ((Bultum, 2014); (Worku, 2010)). Additionally, high levels of illiteracy and limited digital literacy among the population further exacerbate these challenges, preventing many potential users from accessing e-banking services effectively (Gardachew, 2010).

Moreover, while some banks have made strides in adopting digital technologies, there remains a significant disparity in the level of digital service offerings among different banks. For instance, Dashen Bank has been recognized for its early adoption of digital banking technologies; however, it still faces challenges in enhancing its functionalities to keep pace with competitors (Worku, 2010). This inconsistency raises concerns about how effectively banks can leverage digitalization to improve profitability amidst an increasingly competitive landscape.

In light of these issues, this study aims to fill the gap by systematically investigating the relationship between digital banking services and the profitability of commercial banks in Ethiopia. By focusing on key variables such as ATM transactions, mobile banking transactions, internet banking activities, and overall service excellence efforts, this research seeks to provide empirical evidence that can inform strategic decisions for bank managers and policymakers. Understanding these dynamics is crucial for enhancing financial performance and promoting broader financial inclusion in Ethiopia's evolving banking sector.

1.3. Research Questions

In accordance to the research purpose and objective, bellows are questions that will be addressed in this research:

1.3.1. Main Research Question

How does digitalization influence the profitability of selected commercial banks in Ethiopia?

1.3.2. Specific Research Questions

- ✚ Does the use of ATM transactions impact the profitability of commercial banks in Ethiopia?
- ✚ Does mobile banking influence the profitability of commercial banks in Ethiopia?
- ✚ Does internet banking affect the profitability of commercial banks in Ethiopia?
- ✚ How does service excellence, as a component of digitalization, affect the profitability of selected commercial banks in Ethiopia?

1.4. Objective of the Study

1.4.1. General Objective

The primary objective of this research is to investigate the impact of digitalization on the profitability of selected commercial banks in Ethiopia.

1.4.2. Specific Objectives

The specific objectives are as follows:

- To analyze the impact of ATM transactions on the profitability of commercial banks in Ethiopia.
- To assess the impact of mobile banking transactions on the profitability of commercial banks in Ethiopia.
- To evaluate the impact of internet banking transactions on the profitability of commercial banks in Ethiopia.

- To examine the influence of service excellence as a component of digitalization on the profitability of selected commercial banks in Ethiopia.

1.5. Research Hypothesis

H1: ATM transactions have a significant impact on the profitability of commercial banks in Ethiopia.

H2: Mobile banking transactions have a significant impact on the profitability of commercial banks in Ethiopia.

H3: Internet banking transactions have a significant impact on the profitability of commercial banks in Ethiopia.

H4: Service excellence as a component of digitalization have a significant impact on the profitability of selected commercial banks in Ethiopia.

1.6. Significance of the Study

This study is significant in the context of Ethiopia's evolving banking sector, particularly regarding the impact of digital banking services on the profitability of commercial banks. With only about 45% of adults having a bank account as of 2022 (Global Finance, 2023), the findings can provide critical insights into how digital banking can enhance financial inclusion for underserved populations. By examining the relationships between various digital banking channels—such as ATM transactions, mobile banking, and internet banking and key performance metrics like Return on Assets (ROA) and Return on Equity (ROE), this research addresses a notable gap in existing literature. It offers a robust framework for understanding how these services can be leveraged to improve financial performance, thus informing strategic decision-making for bank managers and policymakers.

Moreover, this study has important implications for policy formulation and customer engagement strategies within the Ethiopian banking sector. As banks invest in digitalization initiatives, understanding the factors that drive profitability will be essential for maximizing returns on these investments. The findings can guide policymakers in creating supportive regulatory frameworks that facilitate innovation while ensuring consumer protection (National Bank of Ethiopia (NBE),

2016). Additionally, by identifying key determinants influencing customer usage of e-banking platforms, banks can tailor their marketing strategies to enhance user experience and satisfaction. Overall, this research not only contributes to academic knowledge but also serves as a valuable resource for stakeholders navigating the challenges and opportunities presented by the digital transformation of banking services in Ethiopia.

1.7. Delimitation/Scope of the Study

The objective of this study is to examine how implementation of digitalization affects profitability, relationship between digital payment and financial profitability, service excellence of commercial banks in Ethiopia. The study is limited to five commercial banks out of the thirty private banks and one state-owned commercial bank. The questioners are developed only for employees of the institutions while external stake holders do not include such as customer feedback. Selection of dependent variable, Return on Equity (ROE) and Return on Asset (ROA) which fit the study was also part of limitation. Because there are many variables which determinants of performance but not relevant for this study the researcher needs to choose the more appropriate variables so that it is suitable with the independent variables, ATM transaction, Internet banking transaction, mobile banking transaction and service excellence. The data was verifiable since it came from each selected banks head office and commercial banks published annual audited financial statements. However, the study has limitation to the degree of precision of the data obtained from the secondary source.

Banks profitability determinants except ROA and ROE which used as proxy variable to measure profitability are mostly categorized into two broad factors which are internal and external factors (Sarwar B. &, 2018). While, under these investigations the study considered only the internal factor to measure profitability of the Bank.

Therefore, the study measured the impact of digitalization on profitability without inclusions of external determinants such as GDP, inflation and others. The application of digitalization is a recent issue in commercial banks of the country. To enable us to determine the impact of digitalization on the profitability of the commercial banks, the secondary data was collected and analyzed for the time periods covering only the periods from 2021 to 2024.

1.8. Organization of the Paper

The study is prepared in five chapters. The opening section deals with introduction consisting the study background, problem statement, proposed questions, objectives of the research, hypothesis, significance and scope of the research and definition of key terms. The second section deals with reviewing literatures related to the study area which includes theoretical and empirical literature reviews as well as the conceptual framework. The third chapter includes the research methodologies employed in the study. The fourth chapter is all about data analysis, presentation and interpretation. The fifth chapter focused on conclusions and recommendations. Finally, appendix is attached in the final part of the paper.

1.9. Definition of Key Terms

1. **Digital Banking:** Refers to the use of digital technologies to provide banking services and products, allowing customers to conduct financial transactions through electronic channels such as mobile apps, websites, ATMs, and online banking platforms.
2. **Profitability:** A financial metric that indicates the ability of a bank to generate income relative to its expenses over a specific period. Common measures of profitability include Return on Assets (ROA) and Return on Equity (ROE).
3. **Automated Teller Machine (ATM):** An electronic banking outlet that allows customers to perform basic financial transactions, such as cash withdrawals, deposits, and balance inquiries, without the need for human interaction.
4. **Mobile Banking:** A service that allows customers to conduct financial transactions using mobile devices, typically through a dedicated banking application. This includes services such as fund transfers, bill payments, and account management.
5. **Internet Banking:** Also known as online banking, this service enables customers to access their bank accounts and perform transactions via the internet. It includes features like account balance checks, fund transfers, and online bill payments.

6. **Return on Assets (ROA):** A financial ratio that indicates how efficiently a bank is using its assets to generate profit. It is calculated by dividing net income by total assets.
7. **Return on Equity (ROE):** A measure of financial performance that calculates how much profit a bank generates with the money shareholders have invested. It is expressed as a percentage and is calculated by dividing net income by shareholder equity.
8. **Financial Inclusion:** The process of ensuring access to appropriate financial products and services for all individuals and businesses, particularly those who are underserved or excluded from the formal financial system.
9. **Digitalization:** The integration of digital technologies into everyday banking operations and services, transforming traditional banking practices into more efficient and accessible digital formats.
10. **Service excellence:** refers to the ability of service providers to consistently meet and often exceed customer expectations, creating memorable and positive experiences. It is characterized by a commitment to delivering high-quality service that goes beyond standard offerings, thereby fostering customer loyalty and satisfaction. Service excellence involves understanding customer needs, anticipating their desires, and providing thoughtful, personalized interactions that leave a lasting impression.
11. **Customer Engagement:** The interaction between a bank and its customers through various channels that fosters loyalty and satisfaction. Effective customer engagement strategies are essential for promoting the adoption of digital banking services.

These key terms provide a foundational understanding of the concepts central to this study on the impact of digital banking services on the profitability of commercial banks in Ethiopia.

CHAPTER TWO

2. Literature review

The advent of digital technology has transformed various sectors, and banking is no exception. In Ethiopia, where the banking sector has traditionally relied on physical branches, the recent push towards digitalization presents both opportunities and challenges for profitability. This literature review explores the implications of digitalization on the profitability of selected commercial banks in Ethiopia, drawing on theoretical frameworks and empirical studies.

2.1. Theoretical Review

The theoretical underpinnings of the relationship between Information Communication Technology (ICT), e-banking, and bank profitability are rooted in the concept of technological innovation and its impact on organizational performance. However, this relationship is not always straightforward, as evidenced by the "Productivity Paradox" proposed by Solow, which suggests that the benefits of ICT investments may not immediately translate into improved financial performance.

Financial institutions, particularly commercial banks, play a crucial role in developing a country's economy. The efficiency, effectiveness, and discipline of the banking sector can lead to rapid growth in various economic sectors. This theoretical perspective underscores the importance of studying factors that influence bank profitability, including technological advancements and bank specific characteristics.

2.1.1. Impacts of Digitalization on Bank Profitability and Performance

The world is undergoing a rapid digital transformation, dubbed the fourth industrial revolution by some. Several economies and private businesses have begun the process of digital transformation. Ethiopia is expected to follow Ethiopia's lead. The Ministry of Innovation and Technology has released the National Digital Transformation Strategy, which outlines significant changes aimed at transforming Ethiopia into a digital nation by 2025. Payments are a critical enabler for this change, and since technology allows for faster and more frictionless data (and money) transfers in the modern day, a stable and ethical digital payments ecosystem is required.

A service for digital banking activity has become a hot topic in the financial business in the new millennium (Wadesango, 2020). Digitalization has been known to affect the performance of commercial Banks, both positively and adversely. In the past decade various scholars from different corners of the world have studied the various effects of digitalization on profitability, operations and service quality of commercial banks. There are also researches made in the African continent, especially in countries like Rwanda, Nigeria, and Kenya where there are relatively better digital banking experiences. These countries have clear digital vision and policy frameworks. Although very few, local researches have been made in order to determine the effects of digitalization on the performance of Ethiopian commercial Banks.

2.1.2. Digital Banking

Digital banking refers to the digitization of all traditional banking activities and services that were previously only available through physical branches. It encompasses a wide range of financial services delivered through digital channels, such as mobile apps, websites, and online platforms. This transformation allows customers to perform various banking functions, including checking account balances, transferring funds, applying for loans, and managing investments, all from the convenience of their devices, 24/7. Digital banking enhances customer experience by providing personalized services through data analytics, enabling banks to tailor offerings to individual preferences and behaviors. Additionally, it facilitates faster transactions and reduces the need for in-person visits, thereby optimizing operational efficiency and reducing costs for banks. However, the rise of digital banking also brings challenges, such as the need for robust cybersecurity measures to protect sensitive financial information and the necessity for banks to continuously innovate to stay competitive in an increasingly digital landscape. Overall, digital banking represents a significant shift in how financial services are delivered and consumed, driving both convenience for customers and operational transformation for banks.

2.1.3. Definition of Important Terms and Concepts

For the scope of this research the following definitions of important terms and explanation of ideas will apply:

2.1.3.1. Digitalization

Digitalization is a digital transformation process that involves the integration of digital technologies into all areas of a business, leading to fundamental changes in how the business operates and delivers value to its customers. The dynamic and rapidly evolving digital landscape is driving disruptive change across all industries. Digital transformation in banking is the act of integrating digital technologies and strategies to optimize operations and enhance personalized experiences. Across the financial services industry, this can only occur by breaking down data silos and reimagining the customer experience.

Digitalization is defined as the creation of a new customer experience on the outside and an efficient, effective operating model on the inside, both of which are enabled by digitalization and the underlying technology, processes, and structures. Digitalization largely focused on enhancing the present offering by introducing new, technology-enabled services that would improve client accessibility and value. Mobile apps, e-wallet solutions, online banking, APIs, and personal finance management (PFM) tools are the most well-known examples (Shukla, 2016). The world is rapidly changing to be more digitally focused, especially in the banking industry. Traditional banks are undergoing major digital transformations in order to meet the needs of new customers and existing customers seeking a more tailored and individualized banking experience through digital channels. For this to happen, banks and financial institutions must take on a digital transformation strategy that puts customer experience first by analyzing, interacting, and understanding customer needs.

2.1.3.2. Key Enablers for Digitalization

Digitalization in the banking sector can be supported by several key enablers, including enhancing customer experience, products and services, organizational structure, and operations (Shukla, 2016).

Enhancing Customer Experience: It's crucial to fully manage and understand both the expressed and unexpressed needs of current and potential customers, adapting business models accordingly. Customers expect a seamless, multi-channel experience and consistent service as they adjust to the digital landscape. Their satisfaction hinges on three main factors: how well companies grasp their needs, the ease of doing business, and the overall enjoyment of the experience.

Improving Products and Services: Historically, banking has prioritized sales targets over understanding customer needs. However, there is a growing shift towards a customer-centric approach. Digitalization allows banks to serve billions of customers at lower costs. To maintain a competitive advantage, banks must innovate products and services that align with customer demands.

Restructuring the Organization: Many banks have not aligned their internal structures and governance policies to support a multi-channel approach. Efforts have primarily focused on digitalizing front-end services, often neglecting back-end operations. A comprehensive restructuring of existing systems is necessary to facilitate the digital banking transition.

Optimizing Operations: The digital landscape thrives when customers, competitors, and regulatory bodies are all engaged in a transparent and convenient banking experience. Customer loyalty is not guaranteed; instead, banks can uncover opportunities by analyzing the complete customer life cycle. This can enhance service through effective digital marketing and customer service strategies, ultimately focusing on improving customer experiences.

2.1.4. The Application of Digitalization in Business

Digitalization in business refers to the integration of digital technologies into all aspects of operations, fundamentally changing how businesses operate and deliver value to customers. Digitalization significantly enhances business capabilities, driving efficiency, improving customer experiences, and fostering innovation. While the transition requires investment and adaptation, the long-term benefits can be substantial, positioning businesses for success in an increasingly digital marketplace. Here's a detailed overview of its applications:

1. Operational Efficiency

- **Automation:** Businesses use software and robots to automate repetitive tasks, reducing labor costs and increasing efficiency. For instance, inventory management systems can automatically track stock levels.
- **Process Optimization:** Digital tools help streamline processes, from supply chain management to customer service, enabling quicker and more efficient workflows.

2. Data Analytics

- **Business Intelligence:** Companies analyze large datasets to extract actionable insights, informing strategic decisions. Tools like Tableau and Power BI visualize data, allowing for better trend analysis.
- **Predictive Analytics:** Businesses forecast future trends and consumer behavior using machine learning algorithms, helping them to stay ahead of the competition.

3. Customer Engagement

- **Personalization:** Digitalization allows for personalized marketing efforts, where businesses tailor products and services to individual customer preferences using data collected from previous interactions.
- **Omni-channel Experience:** Companies create seamless experiences across various platforms (web, mobile, and in-store), enhancing customer satisfaction and loyalty.

4. E-commerce and Online Presence

- **Online Sales Platforms:** Businesses establish online stores to reach broader audiences, enabling 24/7 sales. E-commerce platforms like Shopify and Woo Commerce facilitate this transition.
- **Digital Marketing:** Utilizing SEO, social media, email campaigns, and pay-per-click advertising allows businesses to reach potential customers effectively.

5. Supply Chain Management

- **Real-time Tracking:** Digital tools enable real-time tracking of shipments and inventory, enhancing transparency and reducing delays.
- **Collaboration Tools:** Digital platforms improve collaboration among suppliers, manufacturers, and retailers, optimizing the entire supply chain process.

6. Remote Work and Collaboration

- **Virtual Collaboration Tools:** Tools like Zoom, Slack, and Microsoft Teams facilitate remote work, allowing teams to communicate and collaborate effectively regardless of location.
- **Cloud Computing:** Services like Google Workspace and Microsoft 365 provide flexible access to files and applications from anywhere, fostering productivity.

7. Financial Management

- **Digital Payments:** Businesses can accept a variety of digital payment methods (e.g., credit cards, mobile wallets) which streamline transactions and improve cash flow.
- **Accounting Software:** Tools like QuickBooks and Xero automate financial reporting, invoicing, and budgeting, making financial management more efficient.

8. Innovation and Product Development

- **Rapid Prototyping:** Digital tools enable quicker testing and iteration of product designs through 3D modeling and simulation.
- **Crowdsourcing Ideas:** Companies can leverage online platforms to gather consumer feedback and ideas for new products, engaging customers in the innovation process.

9. Human Resource Management

- **Recruitment Technology:** Platforms like LinkedIn and applicant tracking systems (ATS) streamline the hiring process, enabling businesses to find and hire talent more efficiently.
- **Employee Engagement Tools:** Digital tools facilitate performance tracking, feedback, and training, improving overall employee satisfaction and productivity.

10. Cybersecurity

- **Data Protection:** As businesses digitalize, protecting sensitive information becomes paramount. Implementing cybersecurity measures (like encryption, firewalls, and regular audits) is essential to safeguard against breaches.

2.1.5. Banking practice in Ethiopia

Modern banking in Ethiopia began in 1905 with the founding of Abyssinian Bank, which was founded on a fifty-year deal with the Anglo-Egyptian National Bank. In 1908, three foreign banks, the Socite Nationale d'Ethiope pour le Développement de l'Agriculture et du, Banque de l'Indochine, and Compagnie de l'Afrique Orientale, were created (Pankhurst, 1963). As Geda (2006) points out these institutions have been chastised for being wholly owned by foreigners. The Ethiopian government purchased Africa's first national bank in 1931, renaming it Bank of Abyssinia after the Abyssinian Bank, which had only been in operation for a few years before being closed owing to the Italian invasion. Several Italian bank branches had been established by the time of the Italian invasion.

During the five years of Italian occupation, banking activity increased (1936-41). Italy's banks were quite active. Barclays Bank was established following Ethiopia's independence from Italy's brief occupation, and it remained in operation in Ethiopia between 1941 and 1943, thanks to Britain's strategic planning throughout World War II (Geda, 2008) in 1943, the Ethiopian government established the Ethiopian State Bank. Before being reformed into the National Bank of Ethiopia (the Central Bank, re-established in 1976) and the Commercial Bank of Ethiopia, the Bank of Ethiopia served as both a commercial and a central bank until 1963. Following this time, a flood of new banks arose, many of which had been in operation prior to the Great Depression. Following the fall of the imperial government in 1974, the Commercial Bank of Ethiopia (CBE) took over all private commercial banks. Ethiopian financial sector reforms did not allow private sector participation in existing government banks or the entry of foreign banks until 1994 Geda (2006). After 1994, a new chapter in the history of banking was written, allowing local private banks to operate in the country. As a result, Awash international bank S.C, Ethiopia's first indigenous private commercial bank, was founded by 486 initial shareholders with a paid-up

capital of Birr 24.2 million. It received its banking license on November 10, 1994, and began operations on February 13, 1995.

With a recently joined four private commercial banks, the Current banking industry comprises one state-owned development bank and 21 commercials including the state owned dominant Commercial Bank of Ethiopia (NBE., 2021/2022).

According to (Keatinge, 2014) the financial sector in Ethiopia is dominated by the state-owned Commercial bank and also the sector is on its infancy stage. CBE dominate the sector and it accounts with a total of 70 percent of the industry's asset holdings. This monopoly has a negative influence on the country's economic growth and financial intermediation. In comparison, banking businesses in regional and international peer countries have a substantially higher level of private sector and foreign participation. Literatures revel, compared to most countries, for so many purposes and intent, Ethiopia has refrained from opening up its banking industry. This generally resulted in less development than its regional peers (Keatinge, 2014).

The banking sector dominates Ethiopia's financial sector. The strength of any economy is determined by the efficiency and competitiveness of its financial system. Ethiopian banks, like those in other developing countries, play a critical part in the country's economic growth and development. Banks are a necessary component of every financial system. They serve a crucial role in moving surplus sector savings to deficit sectors.

Since the financial liberalization in Ethiopia, the numbers of financial institutions come to operation increase rapidly. However, Cash remains the most widely used medium of exchange (Gardachew, 2010).

2.1.6. Digital Banking practice in Ethiopia

Ethiopia's main state-owned bank, Commercial Bank of Ethiopia, began e-banking in 2001. With eight ATMs in Addis Ababa, CBE was a pioneer in establishing ATM service for local users. Furthermore, CBE had been a Visa member since November 14, 2005. However, due to lack of adequate infrastructure, the membership was not successful.

Dashen bank began offering ATM and POS services to Visa cardholders in 2004. In 2008, the bank received a membership license from MasterCard and began taking MasterCard in addition to Visa cards. Customers might withdraw a maximum of 3,000 birr in a single transaction. The bank has

worked hard to maintain its position as the market leader in electronic payment systems (Gardachew, 2010). Dashen Bank is the first bank in Ethiopia to provide a full-fledged payment card service as a primary plus member of AMEX, VISA, MasterCard, and Union Pay, as well as the first African bank to sign such an arrangement. Dashen Bank has placed 389 ATMs and 1,283 plus Point-of-Sale (POS) terminals across the country. Through its Omni channel banking services, the bank provides digital payment capabilities as well as access to aggregated digital products and services. One of a kind in Ethiopia is the launch of an international commerce gateway that accepts international cards such as Amex, Visa, and MasterCard (Annoual Report, 2022). On December 30, 2008, Wegagen Bank inked an agreement with Technology Associates (TA), a Kenyan information technology (IT) business, for the construction of an ATM network and a payment system solution. Currently the bank offers different digital banking products to its customers (Bank W. , 2021).

Zemen Bank launched a full-fledged version of its internet banking services in 2010, allowing users to conduct online bank transfers to other banks, examine balances, and track loan progress, among other things. Zemen bank's services are still available through a variety of banking channels, all of which are adapted to the needs and tastes of its customers and are all incorporated into Omni channel banking (Bank Z. , 2021).

On July 5, 2012, three private commercial banks agreed to launch Premium Switch Solutions S.C. (PSS) with a capital of 165 million birr. Awash International Bank, Nib International Bank, and United Bank have created a consortium to provide electronic banking services. Berhan Bank joins the consortium on June 27, 2013. The arrangement is Ethiopia's first significant cooperation between competing banks, setting a precedent for other banks to follow in their footsteps, as no single bank in Ethiopia can afford to provide vast regional coverage (Wondimu, 2013).

Electronic banking facilities provided by most Ethiopian Banks are very basic. Next to other private commercial banks, Bank of Abyssinia (BOA) introduced its electronic banking service in 2014 with the support of core banking system which was implemented two years ahead. The Bank has started out card banking (ATM and POS) with 50 ATM machines installed in various location and Mobile Banking. On the same year, The Bank has been also in the process of introducing other types of electronic banking channels such as mobile and internet banking and Agent banking which

enable to increase its effort and proximity to the existing and prospective customers. As a result of the enhancement work which has been made on mobile and internet banking, more secured, reliable and faster online banking products including newly virtual and e-commerce service has roll out to retail and corporate customers (BOA Annual, 2020).

Ethiopia's banking sector appears to be underdeveloped, demanding rapid capacity building and financial system modernization using cutting-edge technologies available elsewhere in the world. Ethiopia's current banking system falls short of offering effective and dependable services, given the expanding number of import-export enterprises, greater international trade, and increased international ties. As a result, all commercial banks in Ethiopia should understand the necessity to implement an electronic banking system in order to meet the needs and requirements of their consumers. (Gardachew, 2010).

Although the adoption of digital mechanisms for financial transactions is still low in Ethiopia, it has a substantial room to expand. The number of debit card holder's increase from time to time. However, only 12% of Ethiopians made or received digital payments during the last year, compared to the 4% of population that hold a debit card. Credit cards are not issued in Ethiopia and are used only by foreigners and diaspora (0.3% of population). However, while peer countries such as Kenya and Rwanda evidenced an increasing usage of mobile money as a solution for financial inclusion (73% and 31% of population), in Ethiopia it is less than 1% due to regulation restrictions (Ethiopia, 2021).

In Ethiopia, the banking sector is rapidly digitalizing, with significant government initiatives promoting digital finance. The National Bank of Ethiopia reported a 15% increase in profitability for banks that adopted digital solutions between 2020 and 2022. Digitalization has enhanced financial inclusion in Ethiopia, particularly among unbanked populations. The introduction of mobile banking services has led to a 20% rise in the number of active accounts in major banks (Association. E. B., 2023). Despite progress, challenges such as limited internet access and a lack of digital literacy remain obstacles. Research indicates that addressing these barriers is crucial for maximizing the profitability gains from digitalization (Association. E. E., 2023).

2.1.7. Digital Banking Types

2.1.7.1. Automated Teller Machines (ATM)

ATMs have been in use for many years and offer the convenience of 24/7 access, allowing customers to access their funds without waiting for bank hours. An ATM is an electronic device that enables users to manage their bank accounts, including making withdrawals and checking balances, all without needing assistance from a teller. Compared to other electronic banking options, ATMs are the most widely recognized and accepted. They were initially introduced to reduce banking costs and enhance efficiency (Bishnoi, 2013); (Abdel.Aziz, 2014). Banks have strategically placed ATMs in various locations like malls and supermarkets to enhance customer access, allowing them to complete routine banking tasks quickly. Moreover, ATMs provide security features that protect users' funds, as access requires a personal PIN.

2.1.7.2. Point of Sale (POS)

A Point-of-Sale system is where commercial transactions occur, allowing customers to purchase items and pay using cards. POS systems can be found in retail cash registers or through online platforms like Booking.com and eBay. Banks support POS systems to facilitate payments via international cards such as VISA and MasterCard. Modern POS terminals have evolved to accept various payment methods, including contactless payments through mobile wallets, leading to the emergence of e-POS systems that handle digital transactions without physical card swiping (Nambisan, 2021).

2.1.7.3. Internet Banking (IB)

Internet banking services are offered through web browsers and mobile applications, enabling customers to conduct banking activities from any location with internet access. This service caters to both individual users and businesses, providing a more efficient alternative to traditional banking methods that are time-consuming and costly (Hasan, 2015). Internet banking benefits financial institutions by reducing costs, improving service delivery, and attracting new clients through a self-service model available around the clock.

2.1.7.4. Mobile Banking (MB)

Mobile banking refers to accessing banking services through mobile devices like smartphones.

This allows users to conduct financial transactions related to their accounts (Saleem, 2011). Research in Kenya highlighted that mobile banking facilitates a range of banking services via mobile devices (Kingoo, 2011). It revolutionizes money transfer in underdeveloped regions and is evolving to provide more complex financial services that can significantly affect users' lives (Mabwai, 2016). Users can check balances, make bill payments, receive transaction alerts, and transfer funds between accounts.

2.1.7.5. Mobile Wallet (MW)

Mobile wallets enable users to pay for transactions with various merchants as long as an agreement exists between the merchant and the wallet provider. Users can also withdraw funds into bank accounts or cash.

2.1.7.6. Virtual Banking (ITM)

Virtual banking combines ATM services with interaction with a live teller through Interactive Teller Machines (ITMs). These machines can handle cash, process checks, and verify identities while also allowing customers to communicate with bank representatives via video or voice, resembling platforms like Skype (Portal.BankofAbyssinia.com).

2.1.7.7. Credit/Debit Cards

Credit and debit cards are similar in appearance, featuring card numbers, expiration dates, and magnetic strips, making transactions convenient both in stores and online. Debit cards withdraw directly from a user's bank account, while credit cards enable borrowing up to a specified limit, requiring repayment with interest. Credit cards generally provide better fraud protection compared to debit cards (Cussen, 2022).

2.1.8. Determinants of Financial Performance

Determinants of financial performance encompass a variety of internal and external factors that influence a company's profitability, efficiency, and overall financial health. Key internal determinants include management efficiency, which reflects how well a company utilizes its resources to generate profits; operational efficiency, which examines cost control and production processes; and strategic decision-making, including investment choices and market positioning. External determinants play a crucial role as well, including economic conditions, which can impact

consumer demand and spending; industry competition, affecting pricing power and market share; and regulatory frameworks, which can impose costs or limitations on business operations. Additionally, factors like access to capital, technological advancements, and market trends also significantly shape financial outcomes. By understanding and analyzing these determinants, businesses can better strategize to enhance their financial performance and achieve sustainable growth.

Furthermore, the financial structure of a company, characterized by its debt-to-equity ratio and overall capital allocation, directly affects its risk profile and cost of capital. A well-balanced financial structure can enhance flexibility and support growth initiatives, while excessive debt may lead to financial distress. Additionally, company culture and employee performance are vital internal determinants, as a motivated workforce can drive innovation and productivity, directly impacting profitability.

Market conditions, such as fluctuations in commodity prices or shifts in consumer preferences, also play a significant role in determining financial performance. Companies that can quickly adapt to these changes often maintain a competitive edge. Furthermore, the influence of globalization cannot be overlooked; firms operating in international markets face unique challenges and opportunities, requiring adept management of foreign exchange risks and cultural differences.

The financial performance of banks reflects their ability to generate revenue and indicates overall financial health, allowing comparisons within the industry. Profitability is the main measure of firm performance, influenced by controllable factors categorized into financial and non-financial variables. Financial variables relate to the bank's balance sheet and income statement, while nonfinancial factors include management quality, efficiency, branch number, size, and technology. Key profitability ratios include Return on Assets, Return on Equity, and Net Interest Margin. Performance determinants are often classified as internal (specific to the bank) or external (macroeconomic). Internal factors include management efficiency and asset quality, while external factors encompass market conditions like regulation and inflation.

Lastly, technological advancements, such as automation and data analytics, can dramatically enhance operational efficiency and decision-making processes, further impacting financial outcomes. By leveraging these tools, businesses can gain insights into consumer behavior,

optimize supply chains, and improve overall performance. In summary, the interplay between internal and external determinants is complex, and a comprehensive understanding of these factors is essential for businesses aiming to enhance their financial performance and ensure long-term sustainability.

2.1.9. Digital Banking and Financial Performance

Before information technology, banking was solely cash-based, posing risks and inefficiencies for both banks and customers. Over the last two decades, technology has transformed banking, introducing electronic channels aimed at enhancing efficiency, convenience, and financial inclusion. Unlike the past, when a large branch network offered a competitive edge, modern banks now rely on e-banking to innovate and reduce costs, which helps attract and retain customers. E-banking has been linked to increased customer acquisition, retention, and revenue growth, though debates exist about whether this revenue justifies the investment. While e-banking can lower overhead costs by reducing the need for branches, initial costs related to system integration and security can impact profits.

Digital banking has transformed the financial services landscape, significantly influencing financial performance for both institutions and customers. By leveraging technology, banks have streamlined operations, reducing costs associated with traditional banking methods. This shift enables them to offer a wider range of services, including online account management, mobile payments, and personalized financial products, which enhance customer engagement and satisfaction. Furthermore, digital banking facilitates data analytics, allowing institutions to better understand consumer behavior and tailor offerings to meet specific needs, ultimately driving revenue growth. Additionally, the reduced need for physical branches has led to lower overhead costs, contributing to improved profit margins. Overall, the integration of digital banking solutions not only enhances operational efficiency but also fosters a more competitive environment, positioning banks to adapt quickly to market changes and consumer expectations, thereby bolstering their financial performance.

In countries like Nigeria and Kenya, electronic banking significantly enhances profitability and operational efficiency. ATMs are favored for their convenience and perceived security over internet banking. The rise of mobile banking has further expanded user access and improved bank

profitability, linking transaction volume to better financial performance. Overall, the focus of digital banking is on minimizing costs and maximizing profits.

2.1.10. Banks performance measurement

We measure bank performance by return on assets (ROA) and return on equity (ROE). ROA is measured as the return on average assets. This ratio considers the returns that are generated from the assets that a bank finance. Thus, it is primarily an indicator of managerial efficiency. ROE is the return over the average equity for each bank and, similar to ROA, it also proxies for bank profitability (Lee, 2014); (Farag, 2017).

The employed market-based measure of bank performance is the price-to-book ratio, which is widely used in the literature to assess profitability (Hunter, 1989) and value creation.

Bank performance metrics can be categorized into internal and external factors. Internal factors include variables that banks can control, which can vary from one institution to another. In contrast, external factors consist of variables outside the bank's control, such as gross domestic product, inflation, interest rates, and political instability. According to (Ngango, 2015), profitability is a key indicator of financial performance, often measured by return on assets (ROA). Other important ratios include return on equity (ROE), which compares profits to shareholder investments. (Mwangi, 2014) Used profitability indicators to evaluate a bank's financial performance, examining whether electronic banking improves efficiency, reduces costs, and saves time. Profitability ratios, such as ROA, demonstrate management efficiency by showing how effectively a company generates net income relative to its total assets. Major profitability indicators include ROA, ROE, net interest margin, and earning spread ratio.

In this study, the researcher focused on ROE and ROA as a profitability measure for commercial banks. However, net interest margin has notable limitations. It fails to capture the bank's full profitability because many banks earn fees and non-interest income, making direct comparisons difficult due to the diversity of their activities and customer bases (source: <https://www.readyratios.com>).

2.2. Empirical Review

Digitalization has transformed the banking sector globally, and Ethiopia is no exception. With the rapid advancement of technology, Ethiopian commercial banks are increasingly adopting digital solutions to enhance efficiency, customer service, and overall profitability. Therefore, one would expect to find ample literature on the impact of the digital transformation on bank performance. However, empirical analyses of the link between digital transformation and bank performance are quite sparse (Kriebel, 2019).

In the following paragraphs the most related studies are analyzed and identified knowledge gaps are documented.

2.2.1. Related Empirical Studies

(Giudice, 2016) Conducted a study to assess how e-banking products affect the profitability of banks. They sampled 3,692 banks across 28 European nations and employed classification analysis to examine the influence of various independent factors on return on equity (ROE). Their findings indicated that offering retail and corporate internet services, along with home banking, significantly enhances banks' ROE.

In another study, (Kimani, 2015) explored the relationship between mobile banking and the operational efficiency of commercial banks in Kenya. This research included a census of all 43 Kenyan commercial banks, analyzing secondary data from 2011 to 2014, focusing on registered mobile banking users, transaction volumes, bank earnings, and operational costs. Using Pearson correlation analysis, the study revealed a positive and significant effect of mobile banking on the banks' operational efficiency, recommending that policymakers should embrace mobile banking technologies.

(Mbama, 2018) Investigated UK customers' perceptions of digital banking, focusing on independent variables such as customer experience, loyalty, and satisfaction, with financial performance as the dependent variable. Utilizing Structural Equation Modeling, ANOVA, and Multivariate Factor Analysis, the study identified key components of customer experience in digital banking, including service quality, perceived value, client engagement, perceived risk, and usability. The results showed a significant relationship between customer loyalty, experience, and satisfaction, which in turn improves financial performance.

(Vekya J. , 2017) Examined how ATM and POS transactions influence the profitability of commercial banks in Kenya (ROE). Using a descriptive design and a census survey of 43 operational banks in 2014, the analysis of secondary data from the Central Bank of Kenya via SPSS revealed that increases in ATM and POS transactions correlate with higher bank profitability (ROE).

(Morufu, 2016) Researched the adoption of e-payments and their effect on Nigerian banks' profitability, focusing on internet banking transactions as the independent variable and return on assets (ROA) as the dependent variable. The study, which utilized secondary data from 2005 to 2012 and applied Panel Regression, found that internet banking transactions negatively impacted banks' profitability. Conversely, (Mulwa, 2017) focused on ROA, online transactions, online fees, and deposits, using a descriptive design and questionnaires from 40 Kenyan banks. The study concluded that online banking transactions have a significant positive effect on ROA, leading to increases in profitability.

(Agboola, 2019) Employed purposive and simple random sampling to assess how digitalization enhances the performance of commercial banks in Nigeria, surveying 370 non-managerial staff using self-structured questionnaires processed through SPSS. The findings indicated a small yet significant positive correlation between digitization and bank performance, along with a stronger link between product innovation and bank performance. Effective implementation of digitization was shown to significantly boost commercial banks' performance in Nigeria.

(Boateng K., 2020) Analyzed Ghana's banking system's adoption of various electronic banking channels over the last two decades aimed at enhancing efficiency, convenience, and financial inclusion. Their study on the impact of digital banking on the profitability of Ghanaian deposits used secondary data from the Central Bank's annual reports, analyzed through Partial Least Square (PLS) regression. The results indicated that out of six independent variables, only two had a significant positive effect on bank profitability. Specifically, cheque code line clearing and the Ghana automated clearing house were positively linked to profitability, while mobile money and E-zwich showed unexpected negative relationships due to customer dissatisfaction linked to double charges and insufficient E-zwich machines.

In Kenya, (Ogare, 2013) examined how e-banking affects the financial performance of commercial banks, looking at relationships between profit after tax and various independent factors such as the number of ATMs and mobile banking usage. Using secondary data from annual reports and the Kenyan Central Bank, the study employed descriptive and inferential statistical analyses, concluding that e-banking positively impacts the profitability of Kenyan banks.

(Mawutor, 2014) Researched the effects of electronic banking on the profitability of Ghana's Agricultural Development Bank, particularly focusing on ATM and internet banking services. Data was collected through structured questionnaires, and analysis via SPSS revealed an increase in net profit margins between 2011 and 2013, concluding that e-banking positively affects the bank's profitability.

Lastly, (Agwu, 2018) studied the influence of e-banking on the operational performance of banks in Nigeria, focusing on revenue, customer loyalty, and operational efficiency. The research, which collected primary data through questionnaires administered to staff of four selected banks, showed that adopting e-banking improves banks' operational efficiency, reflected in increased revenue and customer loyalty.

The aforementioned studies reflect the context of African commercial banking, where a cashless policy has been in effect since 2012 and many banks have integrated various electronic banking methods over the past two decades. The current researcher aims to conduct a similar study in Ethiopia, where the National Digital Payment Strategy was recently introduced in 2021, and the public's adoption of digital financial services is still in its early stages. Currently, Ethiopian commercial banks are not fully digitalized, making digital banking a choice rather than a requirement for customers.

2.2.2. Related Empirical Studies in Ethiopia

(Girma A. , 2016) Used secondary data to conduct a research ICT impact on the performance of the Ethiopian banking industry from 2010 to 2014. The data is analyzed in a panel environment. The researchers used a purposive selection strategy to choose six samples from Ethiopia's 18 commercial banks. The study used ROA as dependent variable and six independent variables (ICT investment, ATM, POS, INFLATION, BRANCH and GDP) and deployed co-integration technique.

According to the regression results, ICT, ATMs, and Regression analysis to affirm the result and impact of ROA analyzed using ordinary least square POS have no statistically significant impact on commercial banks' return on assets. Based on the study's findings and conclusions, the researcher advised Ethiopian commercial banks to enhance their return on assets by improving their ICT.

(Dawit, 2017) Made a study to identify the relationship between IT investment and profitability of commercial banks in Ethiopia. In order to achieve this, Dawit used a multivariate regression model using ROA as a dependent variable for measuring financial performance whereas he used six independent explanatory variables, three of which are IT related (Hardware, Software and IT Service). The researcher has concluded that there is a negative significant relation between IT investment and financial performance.

(Kassa, 2017) found that E-banking services have a favorable impact on the profitability of CBE by minimizing transaction processing mistakes, saving time, lowering the risk of losing cashes, and enhancing the bank's operational reliability. While the study finds that attracting new clients to the bank, reducing the firm's human resource requirements, and improving customer loyalty to the bank are all of lesser value. Electronic banking and its five components (i.e., automated teller machines, bank cards, online banking, telephone banking, and point of sale) have a favorable link with bank profitability, according to the empirical investigation.

(Solomon, 2016) Looked at the impact of e-banking on return on assets, one of the most important indicators of profitability, in his study on the Roles of E-banking on Financial Commercial Banks in Ethiopia. Secondary data from 10 commercial banks operating in Ethiopia was selected using a purposeful sampling strategy for the years 2013 to 2015. Solomon used the E-view 8 application to perform a Random effect panel least square regression with ROA as the dependent variable, and six independent explanatory variables and other control variables, including the value or price of an ATM transaction, the value or price of a POS transaction, a debit card, the number of automated teller machine terminals, the number of point-of-sale terminals, and the market share. The researcher came to the conclusion that having more ATMs, POS, and market share had a positive impact on commercial banks' financial performance, with many banking institutions stating that having more market share allowed them to achieve greater scale in their operations, which

improved their profitability. Finally, the study concluded that, in order to improve return on assets, commercial banks should focus more on raising knowledge about e-banking services and providing fast support to consumers.

(Girma E. , 2019) Conducted research on the role of e-banking on the financial performance of commercial banks in Ethiopia on secondary data collected from ten commercial banks in Ethiopia for the year covering 2015 to 2018. Number of ATM terminals, number of debit cards, number of mobile banking users, value of ATM transactions, value of mobile banking transactions, bank size and inflation rate were independent variables used for the study with ROE as a dependent variable to study the banks performance on the role of bank specific variables. STATA 13 was used to analyze the data and the result shows that number of mobile banking users and value of ATM transactions had positive and significant roles on bank's profitability measured by return on equity. Whereas, bank size had negative and significant role while inflation had a positive significant role from macroeconomic variable on bank's profitability.

The adoption of digital banking services, such as mobile banking, online banking, and automated teller machines (ATMs), has been on the rise. According to studies, as of 2022, over 70% of commercial banks in Ethiopia have implemented some form of digital banking.

A study by (Assefa, 2021) analyzed the financial performance of ten commercial banks in Ethiopia over a five-year period. The findings indicated a positive correlation between the level of digitalization and profitability measures such as Return on Assets (ROA) and Return on Equity (ROE). The research highlighted that bank investing in technology experienced a significant increase in customer acquisition and retention.

Research by (Berhanu, 2022) focused on the cost-saving implications of digital banking. The study found that banks that adopted digital solutions could significantly reduce operational costs. The automation of services decreased the need for physical branches and staff, allowing banks to allocate resources more efficiently, ultimately boosting profitability.

A qualitative analysis by (Desta, 2023) emphasized the role of digitalization in enhancing customer experience. Improved service delivery through mobile applications and online platforms led to higher customer satisfaction, which is directly linked to increased profitability. The study

suggested that banks with better customer service experience saw higher retention rates and increased transaction volumes.

Despite the benefits, several studies highlighted challenges associated with digitalization, including cybersecurity risks and the digital divide in Ethiopia. For instance, research by (Alemayehu, 2023) pointed out that while urban areas saw a rapid uptake of digital services, rural areas lagged, and creating disparities in service access. This uneven adoption can impact overall profitability in the long term.

2.3. Research Gaps

There has been considerable research in the field of digitalization, particularly within the African commercial banking sector. However, in the Ethiopian context, only a limited number of studies have explored the link between digitalization and the profitability of commercial banks. While some previous research exists, much of it has concentrated on topics like e-banking adoption, barriers and benefits, challenges, customer satisfaction, and the relationship between bank performance and investments in IT infrastructure and automation costs.

A review of the literature on the effects of electronic banking on the financial performance of commercial banks reveals a knowledge gap. For instance, the studies by Girma and Dawit emphasized the impact of investments in IT automation and basic ICT infrastructure rather than on the digitalization of banking services as a strategic approach. Kassa's research focused on the advantages of adopting e-banking services by the Commercial Bank of Ethiopia, highlighting operational cost reductions and improvements in transaction processing, risk management, and reliability—areas related to operational excellence. Meanwhile, Girma E.'s study investigated the role of e-banking in selected Ethiopian commercial banks, examining factors like the number of mobile banking users, ATM usage, transaction values, and macroeconomic indicators such as inflation, which were more aligned with bank performance metrics rather than e-channel products. In contrast, the current researcher aims to examine not only how digital banking products affect the profitability of commercial banks in Ethiopia but also how adopting a digitalization strategy influences service quality and operational excellence within these banks.

Moreover, most local studies were carried out before the National Digital Payment Strategy was introduced. The researcher aims to conduct research after this strategy's implementation,

potentially providing new insights, as it is generally believed that the strategy will impact the behavior of the local financial ecosystem.

2.4. Variables in the Study

In this study, several key variables are examined to understand their impact on the profitability of commercial banks in Ethiopia, particularly in the context of digital banking services. The primary variables include:

1. **Automated Teller Machine (ATM) Transactions:** This variable represents the volume and value of transactions conducted through ATMs. Previous studies have shown that ATM transactions significantly contribute to bank profitability by reducing operational costs associated with in-branch services (Mekonnen A. , 2022). The positive relationship between ATM usage and profitability is attributed to increased customer convenience and reduced overheads for banks, as customers can perform transactions independently.
2. **Mobile Banking Transactions:** This variable captures the number and value of transaction Carried out via mobile banking platforms. Research indicates that while mobile banking has the potential to enhance profitability through increased transaction volumes, its impact can vary depending on user adoption rates and service quality ((Ayana, 2014); (Mekonnen A. , 2022)). The effectiveness of mobile banking in driving bank profitability is contingent upon factors such as customer trust and digital literacy levels among users.
3. **Internet Banking Transactions:** Similar to mobile banking, this variable encompasses the volume and value of transactions made through internet banking services. Studies have highlighted that internet banking can improve customer access to financial services and streamline operations, thus positively impacting profitability (Solomon, 2016). However, the relationship may be influenced by the number of active users and the overall user experience provided by the banks.

4. **Service excellence:** refers to the ability of service providers to consistently meet and often exceed customer expectations, creating memorable and positive experiences. It is characterized by a commitment to delivering high-quality service that goes beyond standard offerings, thereby fostering customer loyalty and satisfaction. Service excellence involves understanding customer needs, anticipating their desires, and providing thoughtful, personalized interactions that leave a lasting impression. Digitalization encompasses various aspects, including the implementation of mobile banking, internet banking, ATMs, and other electronic payment systems.

Research has shown that digitalization can significantly enhance operational efficiency, reduce transaction costs, and improve customer satisfaction (Mekonnen A. , 2022). In the Ethiopian context, digitalization is critical for promoting financial inclusion, as it allows underserved populations to access banking services more easily.

The impact of digitalization on bank profitability is multifaceted. Studies indicate that while digital banking services can lead to increased transaction volumes and customer engagement, their effectiveness in driving profitability depends on factors such as user adoption rates and the quality of service provided ((Ayana, 2014); (Yilma, 2024)). For instance, the successful implementation of EthSwitch, Ethiopia's national payment switch, aims to enhance interoperability among banks and facilitate seamless transactions (EthSwitch. , 2024). However, challenges such as limited access points and outdated policies that require customers to visit physical branches can hinder the full realization of digitalization benefits.

Moreover, the relationship between digitalization and bank performance metrics like Return on Assets (ROA) and Return on Equity (ROE) is an essential area of investigation. While some studies have found a positive correlation between digital banking adoption and profitability (Mekonnen A. , 2022), others suggest that banks must continuously innovate and improve their digital offerings to maintain a competitive edge. Understanding how digitalization interacts with other variables in this study will provide valuable insights into its role in enhancing the profitability of commercial banks in Ethiopia.

In general, digitalization represents a critical variable in this research, as it captures the ongoing transformation within the Ethiopian banking sector. By examining its effects on profitability alongside other key variables such as ATM transactions and mobile banking usage, this study aims to contribute to a deeper understanding of how digital technologies can drive financial performance in the context of developing economies.

By examining these variables, this study aims to provide a comprehensive understanding of how digital banking services affect the profitability of commercial banks in Ethiopia. The findings will contribute to existing literature by elucidating the relationships between these variables and offering insights for strategic decision-making within the banking sector.

2.4.1. Digital Banking and Service Quality

In a competitive landscape, the quality of service is crucial for the success of any organization, impacting its overall competitiveness. Banks, in particular, must continually enhance their service quality, as current high standards may not suffice in the future. Additionally, they should devise new strategies to meet customer needs and deliver exceptional service that sets them apart from their rivals (Siddiqi, 2011). Providing high-quality banking services can offer banks a competitive edge in revenue generation, customer loyalty, and retention (Kumar, 2010).

In this context, digital banking plays a significant role in differentiating the service quality of one bank from another. Understanding service quality involves adapting to and meeting customer needs, establishing standards, and evaluating how well expectations are met. Digital banking service quality can be assessed through five key dimensions: reliability, tangibles, responsiveness, assurance, and empathy (Nahusenay, 2016).

Reliability: This refers to the ability to deliver services as customers expect, focusing on speed, accuracy, and efficiency. It emphasizes executing transactions quickly and without errors, consistently and around the clock. Or this dimension refers to the ability of the digital banking service to consistently perform its promised functions accurately and dependably. It includes factors such as system uptime, transaction processing speed, and the accuracy of information provided.

Tangibles: This dimension pertains to the physical aspects of e-banking, including facilities, equipment, and communication materials. The environment should attract customers positively. This dimension focuses on the ease of use and accessibility of the digital banking platform. It includes the intuitiveness of the interface, clarity of navigation, and overall user experience, ensuring that customers can efficiently manage their banking needs.

Responsiveness: This involves the willingness of employees to provide timely service and support customers in case of any issues or disputes related to digital banking services. This encompasses the willingness and ability of the service provider to help customers promptly. It includes aspects like customer support availability, speed of issue resolution, and responsiveness to customer inquiries.

Assurance: This dimension relates to the knowledge and skills of employees that instill trust and confidence in customers, especially when problems arise during the use of digital banking. Reliable 24/7 service also enhances customer confidence. Given the sensitive nature of financial transactions, security is a critical dimension. It involves the measures taken to protect customer data, prevent fraud, and ensure safe transactions, including encryption protocols and authentication processes.

Empathy: This involves offering personalized attention and care to customers when they require additional help regarding digital banking services. This dimension reflects the personalized attention and care that the digital banking service provides to its customers. It includes understanding customer needs, offering tailored solutions, and maintaining effective communication that fosters a sense of trust and relationship.

2.4.2. Digital Banking and Service Excellency

To improve customer experience through speed and simplicity, organizations must adopt innovative business models that prioritize back-office efficiency and operational excellence. The digitalization of banking has significantly benefited both financial institutions and their customers by enhancing back-office operations. This transformation opens new avenues for improving business efficiency and customer satisfaction.

Banks are increasingly focusing on standardization, optimization, and effectiveness to achieve operational excellence. By minimizing costs, reducing waste, and utilizing resources more

efficiently, they are transforming their processes through advanced digital technologies. These changes also help combat fraud and corruption. Digital payment solutions, such as mobile money, exemplify the advantages for both service users and banks, particularly in developing countries like Ethiopia, where they provide enhanced convenience and significant cost savings.

The multifaceted benefits of digitalization encompass reduced costs, less inefficiency compared to traditional banking methods, and the elimination of time-consuming processes, such as printing passbooks and traveling to bank branches. Digital payments improve accessibility, fund traceability, and transaction security, which together help mitigate fraud risks. Research by (Olanrewaju, 2014) highlights that the shift towards digitalization in Africa's commercial banking and financial sectors is leading to substantial cost savings and the creation of new revenue streams. Furthermore, the current trend of digitalization presents organizations with vast potential to enhance their operational excellence. By leveraging improved pricing, automation, and digitization, businesses are increasingly integrating digital solutions into their operational frameworks. This strategic integration not only optimizes performance but also positions organizations to thrive in a rapidly evolving market landscape (BCG., 2018).

2.5. Conceptual Framework

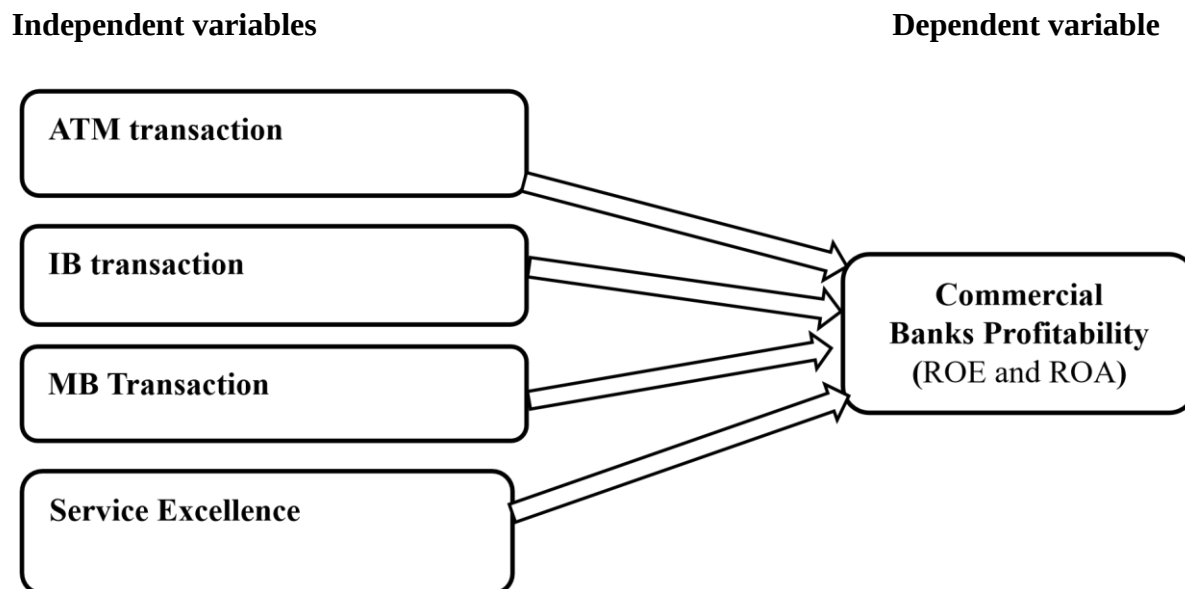
The conceptual framework for this study delineates the relationships between independent variables digital banking services and the dependent variable, which is the profitability of selected commercial banks in Ethiopia. In an era characterized by rapid technological advancements, digital banking has emerged as a critical component of the financial services landscape. The independent variables identified in this framework include ATM transactions, mobile banking transactions, internet banking transactions, and service excellence. Each of these elements plays a pivotal role in shaping customer experiences and operational efficiencies within banks.

ATM transactions represent a fundamental aspect of digital banking, providing customers with convenient access to their funds and facilitating cash withdrawals and deposits. Mobile banking transactions further enhance accessibility, allowing customers to conduct various banking activities through their smartphones, thus promoting financial inclusion. Internet banking serves

as another crucial channel, enabling customers to manage their accounts and perform transactions online, which can lead to increased customer satisfaction and loyalty. Lastly, service excellence encompasses the quality of interactions between banks and their customers, influencing overall customer perceptions and satisfaction.

The dependent variable, profitability, is measured through key financial metrics such as Return on Assets (ROA) and Return on Equity (ROE). Understanding how digital banking services impact profitability is essential for banks aiming to thrive in a competitive market. This conceptual framework serves as a foundation for exploring the intricate dynamics between these variables, providing insights into how effective digital banking strategies can enhance financial performance in the Ethiopian banking sector. By examining these relationships, this study aims to contribute valuable knowledge that can inform strategic decision-making for bank managers and policymakers in the context of ongoing digital transformation.

Figure 1: Conceptual Framework



Source: Researcher

Date 18/6//24

CHAPTER THREE

3. RESEARCH DESIGN & METHODOLOGY

This section deals with the research design and methodology that was applied to carry out this particular research. Research was a logical and systematic search for new and useful information on a particular topic. A systematic approach to problem-solving was known as the research methodology. It involves the specific procedures or techniques that was used to identify how the research can be carried out. In research, the methodology section allows the reader to critically evaluate a study's overall validity and reliability. The research was contributed new ideas to the existing knowledge. It will be done with the help of study, experiment, observation, analysis, comparison, and reasoning. Most importantly, research will seek predictions of events and explanations, relationships, and theories for them (Goundar, 2019). The chapter was organized into five parts; it begins with research design, the study population and sampling techniques, data type and data collection method, data analysis, and model specification.

3.1. Research Design

The study aimed to investigate how digitalization affects the profitability of commercial banks in Ethiopia. To achieve this goal, a quantitative research method was employed, using both descriptive and explanatory research designs. The explanatory design helps identify and assess the causal relationships among various variables in the study (Marczyk, 2005). It is essential for demonstrating how one variable influences or "causes" changes in another and aids in understanding, explaining, predicting, and managing these relationships (Cooper, 2006). On the other hand, the descriptive survey design is appropriate for illustrating the observed effects of digitalization and trends in bank performance concerning profitability and service excellence due to the implementation of digital banking services.

3.2. Population of the study and Sampling Technique

3.2.1. Target Population

The study's target population is all Ethiopian commercial banks that who adopt digital banking services. However, due to the lack of available organized digital banking data and no complete data on internet banking, the researcher was considered those banks with the required data on hand. Accordingly, five banks from the thirty-one commercial banks registered in Ethiopia was selected. Based on the stated criteria, the selected banks are Commercial Bank of Ethiopia, Awash Bank, Dashen Bank, Bank of Abyssinia, and Zemen Bank. The researcher also considered the total number of 1,996 selected bank branches located in Addis Ababa as the target population for this specific study.

3.2.2. Sample Size Determination

Sample size determination is the most frequently asked question considering sampling in every research. It is influenced by a number of factors, including the purpose of the study, population size, the risk of selecting a "bad" sample, and the allowable sampling error. In addition, the level of precision, the level of confidence or risk, and the degree of variability in the attributes being measured are the three important criteria that usually will need to be specified to determine the appropriate sample size (Israel, 1992).

Therefore, a representative sample of the selected commercial bank branches were calculated based on the formula for sample size determination and for finite population.

According to (Kothari, 2004), the sample size for this study were computed by using the formula below:

$$n = \frac{Z^2 p \cdot q \cdot N}{e^2 \cdot (N - 1) + Z^2 \cdot p \cdot q}$$

Where, **n** = the desired sample size **z** = the value of the standard variation at a given confidence level (to be read from the table giving the areas under normal curve) **p** = the proportion of target population estimated (50%) **q** = 1-p **e** = acceptable error (the precision)

N = population size

Therefore, representative sample of population was determined at 95% degree of confidence.

Hence at 95% degree of confidence;

Z=1.96 p=0.5 q=1-p e=5% (0.05); by substituting;

$$n = \frac{(1.96)^2(0.5)(0.5)(1996)}{(0.05)^2(1996-1) + (1.96)^2(0.5)(0.5)} = 322.29 \text{ which is approximately equal to } 322$$

Therefore, from the population size of 1996 a total sample of 322 branches was used as a representative for the study.

3.2.3. Sampling Techniques

Data collection is essential in research because it supports the understanding of a theoretical framework. Therefore, it's important to carefully choose both the data collection methods and the sources, as no analysis can compensate for poorly collected data.

Purposive sampling, or judgment sampling, involves intentionally selecting participants who can provide valuable insights due to their expertise or experience. This method is used when the researcher believes it will effectively meet the study's objectives and yield the most useful information (Etikan I. M., 2016). In this study, a purposive sampling technique was employed to collect data from employees working in the digital banking areas of selected commercial banks in Ethiopia. This non-probability sampling method is particularly suitable for this research as it allows for the selection of participants who possess specific knowledge and experience relevant to the topic of digital banking.

The purposive sampling approach would involve identifying and targeting employees who are directly involved in various aspects of digital banking, including ATM operations, mobile banking services, internet banking management, and customer service excellence. By focusing on these individuals, the study aims to gather insights that are both relevant and informative regarding the impact of digitalization on bank profitability.

By utilizing purposive sampling and focusing on employees within digital banking, this study aims to provide valuable insights that can inform strategies for enhancing profitability through effective digital banking practices in Ethiopia.

Table 1: Sample Frame

Selected Commercial banks	No. of branches located in A.A	Sample Size	Percentage (%)
Commercial bank of Ethiopia	645	104	32.3%
Awash bank	366	59	18.3%
Dashen bank	439	71	22%
Bank of Abyssinia	464	75	23.3%
Zemen bank	82	13	4.1%
Total	1996	322	100%

3.3. Source and Types of Data

The study employed a quantitative research approach, relying on secondary data that was obtained from the bank's head office and various published and unpublished documents. Key sources of secondary data include financial statements and annual reports. Additionally, primary data was gathered through a formal survey using a self-structured questionnaire. The analysis part utilized descriptive statistics, such as frequency counts, along with inferential statistics. The research focused on Four years of secondary data from 2021 to 2024, a period during which many

commercial banks in Ethiopia was launched their internet banking services and initiate efforts to enhance digitalization, to assess the impact of digitalization on their profitability.

3.4. Methods of Data Collection

In this study, the researcher collected primary data through a structured questionnaire that contains general and specific questions. These questionnaires were administered using a drop-and-pick later method by using Google form. Additionally, secondary data was collected from the banks' head offices, annual reports, and other published and unpublished documents covering the four years period from 2021 to 2024. The secondary data sources provided enough and reliable information for the study, enriching the analysis derived from the primary data.

3.5. Methods of Data Analysis

Once collected, the data was analyzed using descriptive and inferential statistical procedures. Descriptive statistics enable the researcher to analyze the impact of digitalization on profitability using both quantitative and qualitative approaches. In this study, the primary data was analyzed using descriptive statistics, which includes mean, standard deviation, percentages, and frequency of occurrence.

3.6. Model Specification

When researchers aim to quantitatively establish the relationship between independent variables and a dependent variable, they engage in model specification. This involves determining which independent variables to include in a regression equation and which to exclude. A thorough literature review is essential to understand the key independent variables, how they interact with the dependent variable, and what the expected signs and magnitudes of their coefficients might be (Wooldridge, 2016). While statistical metrics play a significant role in defining a model, the selection process should fundamentally rely on theoretical foundations. Overall, the specification of a regression model should primarily stem from theoretical considerations rather than empirical or methodological factors.

In this study, the researcher adopted a multiple regression analysis method to establish the correlation of profitability, which was taken as the dependent variable and regressed against the chosen independent variables.

Therefore, the general multivariate regression model with K independent variables is defined as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

- † **Y** is the dependent variable (profitability of commercial banks).
- † **β_0** , is the intercept (the value of **Y** when all **Xs** are zero).
- † **β_1 , β_2 , β_3 and β_4** are the regression coefficients representing the change in **Y** for a one unit change in the corresponding **X** variable, holding all other **Xs** constant.
- † **X_1 , X_2 , X_3 , and X_4** are the independent variables (ATM transaction, IB transaction, MB transaction and service excellence).

- † **ε** Is the error term, representing the unexplained variation in **Y**.

Applying this formula to the specific research context:

$$Y = \beta_0 + \beta_1 (\text{ATM transaction}) + \beta_2 (\text{IB transaction}) + \beta_3 (\text{MB transaction}) + \beta_4 (\text{Service excellence}) + \varepsilon$$

Interpretation of the Regression Coefficients:

- † A positive coefficient (**β**) indicates a positive relationship between the independent variable and the dependent variable. For example, **$\beta_1 > 0$** would suggest that higher ATM transaction is associated with greater profitability or ROE and ROA for commercial banks.
- † A negative coefficient indicates a negative relationship.

The magnitude of the coefficient reflects the strength of the relationship.

3.7. Instrument validation and reliability

3.7.1. Validity

Validity has been defined by (Bolarinwa, 2015) as the degree to which an instrument measures what it's intended to measure. To strengthen the questionnaire's validity, the researcher engaged specialists in the field, particularly the supervisor, who assessed the content's relevance and assisted in the review and modification of the questionnaire.

3.7.2. Reliability

The consistency with which a method measures something and achieves the same result over time is referred to as reliability. According to (Heale, 2015), reliability refers to the degree to which a research instrument consistently produces the same results. Cronbach's Alpha can be used to determine internal consistency. Pre-testing the questionnaire with five commercial bank e-banking staffs ensured its reliability. The information gathered aided in determining the need for any changes, ensuring that the research instrument measured what it was designed to assess and therefore enhancing the questionnaire's reliability.

A reliability analysis was conducted to assess the internal consistency of the scale used to measure various constructs within the study. The reliability coefficient, Cronbach's Alpha, was calculated for a total of 25 items.

Table 2: Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.874	25

The results indicated a Cronbach's Alpha of 0.874, suggesting that the scale demonstrates very good internal consistency. According to conventional benchmarks for interpreting Cronbach's Alpha, values above 0.8 are considered indicative of high reliability, while values above 0.9 may suggest redundancy among items. The current value of 0.874 indicates that the items in the scale are sufficiently correlated and collectively measure the underlying constructs effectively.

3.8. Ethical Consideration

Ethical considerations are a critical component of any thesis or research project. They ensure that the research is conducted responsibly, respects the rights and dignity of participants, and adheres to academic and professional standards.

This study adhered to strict ethical standards to ensure the integrity, confidentiality, and fairness of the research process. The following ethical considerations were addressed:

1. **Informed Consent:** Participants were provided with detailed information about the study's purpose, procedures, and potential risks. Participation was voluntary, and participants had the right to withdraw at any time.
2. **Confidentiality and Anonymity:** All data collected from banks and individuals were anonymized to protect their identities. Sensitive information was stored securely and accessed only by the researcher.
3. **Data Integrity:** Secondary data from reliable sources, such as the National Bank of Ethiopia and bank financial statements, were used to ensure accuracy and reliability. Data analysis was conducted transparently, and findings were reported honestly.
4. **Avoidance of Harm:** The study was designed to minimize any potential harm to participants or organizations. Findings were presented in a way that respects the reputation and privacy of all stakeholders.
5. **Plagiarism and Academic Integrity:** All sources, including reports, articles, and datasets, were properly cited. Plagiarism detection tools were used to ensure the originality of the work.

By adhering to these ethical principles, this study ensures that its findings are credible, responsible, and beneficial to the Ethiopian banking sector and society at large.

CHAPTER FOUR

4. DATA ANALYSIS, RESULTS AND INTERPRETATION

This chapter presents the data findings to determine the impact of digital banking on profitability of Commercial banks in Ethiopia. The data were analyzed by using SPSS software version 20. The descriptive statistics analysis was done and the findings were presented in form of figures and tables. The result of tests of assumptions; inferential analysis which is performed to examine relationship of variables, influence of independent variable over dependent variable was examined and hypothesis analysis was tested.

A total of 322 questionnaires were distributed out of which 274 (85.1%) were responded, while 48 (14.9%) questionnaires were not returned from respondents. Therefore, 274 questionnaires served as a source of data for analysis, findings presentation and drawing conclusions.

4.1. Profile of Respondents

The demographic factors used in this research were gender, educational level, work experience and professional position.

Table 3: Respondents Profile

	Item	Frequency	Percent	Cumulative Percent
Gender	Male	174	63.5	63.5
	Female	100	36.5	100
	Total	274	100	
Educational Qualification	Diploma	11	4.0	4.0
	BA Degree	162	59.1	63.1
	Masters and above	101	36.9	100
	Total	274	100	
Current Professional Position	Officer	113	41.2	41.2
	Senior-officer	145	52.9	94.2
	Manager	16	5.8	100.0
	Total	274	100	

Working experience	Less than 2 years	7	2.6	2.6
	2-5 years	127	46.4	49
	6-10 years	98	35.8	84.8
	More than 10 years	42	15.2	100
	Total	274	100	

Source: Research Findings, 2024

Digital Banking Services/Products Provided

The distribution of digital banking services and products offered at respondents' banks is summarized in Table 4. A total of 274 individuals participated in the survey, with the following breakdown of services/products:

Table 4: Digital Banking Services/Products Provided

		Frequency	Percent	Cumulative Percent
Valid	ATM	30	10.9	10.9
	POS	40	14.6	25.5
	Mobile Banking	76	27.7	53.3
	Internet Banking	108	39.4	92.7
	ITM /Case of BOA	20	7.3	100.0
	Total	274	100	

Source: Survey output

The table detailing the digital banking services and products offered at the respondents' banks reveals a varied range of services utilized within the sector. Among the 274 participants, **39.4%** (108 respondents) indicated that their banks provide internet banking services, making it the most commonly offered digital banking product. This is closely followed by mobile banking, which is available to **27.7%** (76 respondents) of participants. Point of Sale (POS) services are utilized by **14.6%** (40 respondents), while Automated Teller Machines (ATMs) are reported by **10.9%** (30

respondents). Additionally, 7.3% (20 respondents) noted the availability of Interactive Teller Machines (ITM), specifically in the case of Bank of Abyssinia (BOA). This distribution highlights a strong emphasis on internet and mobile banking services, suggesting that these platforms are integral to the digital banking strategies of Ethiopian commercial banks, which may influence their overall profitability and customer engagement in the digital era.

4.2. Descriptive

4.2.1. Descriptive Statistics for ATM Transactions

The descriptive statistics for respondents' perceptions and usage of ATM transactions are summarized in Table 5. A total of 274 individuals participated in the survey, providing insights into their experiences with ATM services.

Table 5: Descriptive Statistics for ATM Transactions

Descriptive Statistics					
	N	Range	Sum	Mean	Std. Deviation
I frequently use ATM transactions for my banking needs.	274	4	1178	4.30	.769
The availability of ATMs has improved my banking experience.	274	3	974	3.55	.960
ATM transactions are more convenient than visiting a bank branch.	274	4	981	3.58	.947
I believe that ATM transactions have positively impacted the profitability of my bank.	274	4	1144	4.18	.825
I feel secure when conducting transactions at ATMs.	274	4	1102	4.02	.914
Valid N (list-wise)	274				

Source: Survey output

Respondents reported a high mean score of 4.30 (on a scale where higher values indicate greater frequency), suggesting that ATM transactions are frequently utilized for banking needs. The standard deviation of 0.769 indicates relatively low variability in responses, implying consensus among respondents regarding their frequent use of ATMs.

The mean score of 3.55 suggests a moderately positive perception regarding how the availability of ATMs has improved the banking experience. The standard deviation of 0.960 reflects some variability in responses, indicating that while many respondents appreciate the convenience, others may not feel as strongly. A mean score of 3.58 reflects a generally positive view that ATM transactions are more convenient than visiting a bank branch, with a standard deviation of 0.947, indicating moderate agreement among respondents. Respondents believe that ATM transactions positively impact their bank's profitability, as indicated by a mean score of 4.18 and a standard deviation of 0.825, suggesting strong agreement on this point. The mean score of 4.02 indicates that respondents generally feel secure when conducting transactions at ATMs, with a standard deviation of 0.914, showing moderate agreement but also some variability in security perceptions. The results indicate a strong reliance on ATM services among respondents, with high levels of satisfaction regarding convenience and security. The positive perceptions about the impact on bank profitability suggest that banks may benefit from promoting and enhancing their ATM services further.

4.2.2. Descriptive Statistics for Mobile Banking Transactions

The descriptive statistics for respondents' perceptions and usage of mobile banking applications are summarized in Table 6. A total of 274 individuals participated in the survey, providing insights into their experiences with mobile banking services.

Table 6: Descriptive Statistics for Mobile Banking Transactions

Descriptive Statistics					
	N	Range	Sum	Mean	Std. Deviation
I regularly use mobile banking applications for transactions.	274	4	971	3.54	.953
Mobile banking has made managing my finances easier.	274	3	975	3.56	.933
The features offered by mobile banking applications meet my needs effectively.	274	3	1141	4.16	.793

I believe that mobile banking transactions contribute to the profitability of my bank.	274	4	1120	4.09	.897
I trust the security measures in place for mobile banking transactions.	274	3	1117	4.08	.806
Valid N (list-wise)	274				

Source: Survey output

Respondents reported a mean score of **3.54** for the statement "I regularly use mobile banking applications for transactions," indicating a moderately high level of usage among participants. The standard deviation of **0.953** suggests some variability in responses, with a range of experiences regarding the frequency of use. The mean score of 3.56 indicates that respondents generally feel that mobile banking has made managing their finances easier. The standard deviation of 0.933 reflects moderate agreement but also suggests that some respondents may not find mobile banking as beneficial.

A higher mean score of 4.16 for the statement "The features offered by mobile banking applications meet my needs effectively" indicates strong satisfaction with the functionality provided by these applications. The lower standard deviation of 0.793 suggests that responses are more clustered around the mean, indicating consensus among respondents regarding feature effectiveness.

Respondents believe that mobile banking transactions contribute positively to their bank's profitability, as evidenced by a mean score of 4.09 and a standard deviation of 0.897, suggesting strong agreement on this point. The mean score of 4.08 indicates that respondents generally trust the security measures in place for mobile banking transactions, with a standard deviation of 0.806, reflecting moderate agreement and some variability in trust levels.

The results indicate a positive perception of mobile banking services among respondents, with high levels of satisfaction regarding the effectiveness of features and trust in security measures. The belief that mobile banking contributes to bank profitability suggests that banks should continue to invest in and promote these services.

4.2.3. Descriptive Statistics for Internet Banking Transactions

The descriptive statistics for respondents' perceptions and usage of internet banking services are summarized in Table 7. A total of 274 individuals participated in the survey, providing insights into their experiences with internet banking.

Table 7: Descriptive Statistics for Internet Banking Transactions

Descriptive Statistics					
	N	Range	Sum	Mean	Std. Deviation
I often use internet banking for my financial transactions.	274	4	979	3.57	.974
Internet banking provides me with sufficient information about my accounts.	274	4	1174	4.28	.736
I find internet banking to be user-friendly and efficient.	274	4	1015	3.70	.996
I believe that internet banking transactions enhance the profitability of my bank.	274	4	1021	3.73	1.014
The security measures for internet banking are satisfactory.	274	4	1125	4.11	.873
Valid N (list-wise)	274				

Source: Survey output

Respondents reported a mean score of 3.57 for the statement "I often use internet banking for my financial transactions," indicating a moderately high level of usage among participants. The standard deviation of 0.974 suggests some variability in responses, indicating that while many respondents frequently use internet banking, others may not do so as often.

A mean score of 4.28 indicates that respondents feel that internet banking provides sufficient information about their accounts, reflecting strong satisfaction with the information available through these services. The lower standard deviation of 0.736 suggests that responses are clustered closely around the mean, indicating agreement among respondents regarding the adequacy of information provided.

The mean score of 3.70 indicates a generally positive perception that internet banking is user friendly and efficient, with a standard deviation of 0.996, showing moderate variability in responses. Respondents believe that internet banking transactions enhance the profitability of their bank, as indicated by a mean score of 3.73 and a standard deviation of 1.014, suggesting a consensus on this point but with some variability in opinions.

The mean score of 4.11 indicates that respondents generally find the security measures for internet banking to be satisfactory, with a standard deviation of 0.873, reflecting moderate agreement among respondents.

The results indicate a positive perception of internet banking services among respondents, particularly regarding the sufficiency of information and security measures. The belief that internet banking contributes to bank profitability suggests that banks should continue to invest in and promote these services to enhance customer satisfaction and operational efficiency.

4.2.4. Descriptive Statistics for service excellence in Banking

The descriptive statistics for respondents' perceptions of digitalization in banking services in Ethiopia are summarized in Table 8. A total of 274 individuals participated in the survey, providing insights into their experiences and opinions regarding digital banking services.

Table 8: Descriptive Statistics for service excellence in Banking

Descriptive Statistics					
	N	Range	Sum	Mean	Std. Deviation
The customer service provided by my bank is responsive and helpful.	274	4	1097	4.00	.879
My bank effectively addresses any issues or concerns I have regarding digital services.	274	3	1166	4.26	.716
The quality of service I receive enhances my overall satisfaction with my bank.	274	3	1130	4.12	.779
I believe that high service excellence positively influences the profitability of my bank.	274	4	967	3.53	.973
My bank continuously seeks feedback to improve its digital services.	274	4	1169	4.27	.806
Valid N (list-wise)	274				

Source: Survey output

The findings indicate that customer service responsiveness and helpfulness are generally rated positively, with a mean score of 4.00 and a standard deviation of 0.879, reflecting moderate consensus among respondents. Similarly, the ability of banks to address issues related to digital

services received a high mean score of 4.26 (SD = 0.716), suggesting strong agreement that banks are effective in resolving customer concerns. Respondents also expressed satisfaction with the quality of service provided, as evidenced by a mean score of 4.12 (SD = 0.779), indicating that service quality significantly enhances their overall banking experience.

In addition, the results highlight the proactive efforts of banks to improve their digital services, with the statement "My bank continuously seeks feedback to improve its digital services" receiving the highest mean score of 4.27 (SD = 0.806). However, there is a more cautious perception regarding the influence of service excellence on profitability, which scored a lower mean of 3.53 (SD = 0.973) and exhibited greater variability in responses. This suggests that while respondents generally recognize the importance of service excellence, opinions differ on its direct impact on financial performance. Overall, these findings underscore the positive perceptions of service quality and responsiveness in Ethiopian commercial banks while pointing to opportunities for further exploration regarding the link between service excellence and profitability in the digital banking context.

4.2.5. Descriptive Statistics for Digitalization and Profitability

The descriptive statistics for respondents' perceptions of the impact of digitalization on banking profitability are summarized in Table 9. A total of 274 individuals participated in the survey, providing insights into their views regarding the financial benefits of digital services.

Table 9: Descriptive Statistics for Digitalization and Profitability

Descriptive Statistics					
	N	Range	Sum	Mean	Std. Deviation
I perceive that my bank has become more profitable due to digitalization efforts.	274	3	983	3.59	.938
The introduction of digital services has led to an increase in customer base for my bank.	274	4	978	3.57	.940
I believe that digital transactions have reduced operational costs for banks.	274	4	1154	4.21	.897
The profitability of banks is significantly influenced by their digital service offerings.	274	4	1112	4.06	.896

My bank's financial performance has improved as a result of embracing digitalization.	274	4	969	3.54	.953
Valid N (list-wise)	274				

Source: Survey output

Respondents reported a mean score of 3.59 for the statement "I perceive that my bank has become more profitable due to digitalization efforts," indicating a moderately positive perception, although with a standard deviation of 0.938, suggesting some variability in opinions. Similarly, the statement "The introduction of digital services has led to an increase in customer base for my bank" received a mean score of 3.57 (SD = 0.940), reflecting a consensus that digital services may have positively impacted customer acquisition. In contrast, respondents expressed stronger agreement with the belief that "digital transactions have reduced operational costs for banks," which received a mean score of 4.21 (SD = 0.897), and that "the profitability of banks is significantly influenced by their digital service offerings," with a mean score of 4.06 (SD = 0.896).

Overall, while perceptions regarding direct profitability improvements and financial performance were more moderate, as indicated by mean scores of 3.54 (SD = 0.953) for "My bank's financial performance has improved as a result of embracing digitalization," there is a clear indication that respondents recognize the operational efficiencies and cost reductions associated with digital transactions.

4.3. Correlation Analysis

Table 10: Correlation Analysis of Variables

Correlations						
		Profitability of Commercial Banks	ATM Transactions	Mobile Banking Transactions	Internet Banking Transactions	Service Excellence
Profitability of Commercial Banks	Pearson Correlation	1				
	Sig. (2ta iled)					
	N	274				

ATM Transactions	Pearson Correlation	.666**	1			
	Sig. (2ta iled)	.000				
	N	274	274			
Mobile Banking Transactions	Pearson Correlation	.686**	.602**	1		
	Sig. (2ta iled)	.000	.000			
	N	274	274	274		
Internet Banking Transactions	Pearson Correlation	.598**	.408**	.613**	1	
Transactions	Sig. (2ta iled)	.000	.000	.000		
	N	274	274	274	274	
Service Excellence	Pearson Correlation	.714**	.595**	.795**	.760**	1
	Sig. (2ta iled)	.000	.000	.000	.000	
	N	274	274	274	274	274
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: Survey output

The correlation analysis presented in Table 10 demonstrates the relationships between the Profitability of Commercial Banks and various digital banking services, including ATM Transactions, Mobile Banking Transactions, Internet Banking Transactions, and the composite measure of Service Excellence. The results indicate strong positive correlations among all variables, with the highest correlation observed between Service Excellence and profitability ($r=0.714$, $p<0.01$). This suggests that improvements in these areas are significantly associated with enhanced profitability for commercial banks.

Additionally, Mobile Banking Transactions also show a strong correlation with profitability ($r=0.686$, $p<0.01$), indicating that increased usage of mobile banking services is linked to higher profitability. Similarly, ATM Transactions and Internet Banking Transactions correlate positively with profitability ($r=0.666$ and $r=0.598$, respectively, both

$p < 0.01$). These findings highlight the critical role that digital banking services play in enhancing the financial performance of commercial banks, emphasizing the need for continued investment in digital technologies to drive profitability in the banking sector.

4.4. Multiple Linear Regression Analysis

Before analyzing multiple linear regression, the presence of Multi-Collinearity, Linearity, Normality and Homoscedasticity have to be checked.

4.4.1. Multi Collinearity

Multi-collinearity exists when there is high correlation amongst the predictor variables. In this study Variance Inflation Factor (VIF) was used to test multi-collinearity between predictor variables. VIF analyses the outcome of correlations between predictor variables. The VIF result have to be less than 10, and should be close to one.

Tolerance shows how much of the variation of a specific predictor variable is not explained by other predictor variables and can be calculated by using the formula $1 - R^2$ for each variable. If the value is less than 0.20 it means the multiple correlation with other variables is high, indicating the likelihood of multi-collinearity.

Table 11: Collinearity Statistics for Predictors of Profitability

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	ATM Transactions	.596	1.679
	Mobile Banking Transactions	.342	2.923
	Internet Banking Transactions	.419	2.388
	Service Excellence	.234	4.277
a. Dependent Variable: Profitability of Commercial Banks			

Source: Survey output

The collinearity statistics for the regression model predicting the Profitability of Commercial Banks are presented in the table. The Tolerance and Variance Inflation Factor (VIF) values are

critical for assessing multicollinearity among the independent variables: ATM Transactions, Mobile Banking Transactions, Internet Banking Transactions, and Service Excellence.

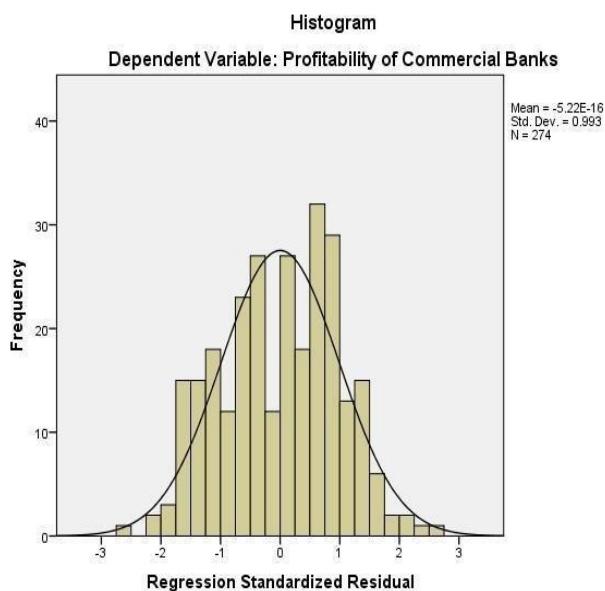
The Tolerance values indicate the proportion of variance in a predictor that is not explained by other predictors. A Tolerance value below 0.1 suggests potential multicollinearity issues. In this analysis, the Tolerance values ranged from 0.234 for Service Excellence (indicating a higher risk of multicollinearity) to 0.596 for ATM Transactions, which is acceptable. Correspondingly, the VIF values, which are the inverse of Tolerance, ranged from 1.679 for ATM Transactions to 4.277 for Service Excellence.

According to standard guidelines, VIF values above 5 indicate moderate to high multicollinearity, while values above 10 warrant further investigation. In this case, all VIF values are below the threshold of concern, suggesting that multicollinearity is not a significant issue in this model. Therefore, the predictors can be considered reliable in assessing their impact on the profitability of commercial banks without substantial multicollinearity interference.

4.4.2. Normality

Normality necessitates the predictor variables in the model to be normally distributed and the error term have to be normally distributed or expected value of the error terms should be zero. If the residuals distributed normally, the histogram will have a bell-shape. Hence, this study applied graphical methods to check normality of the data.

Figure 2: Normality test



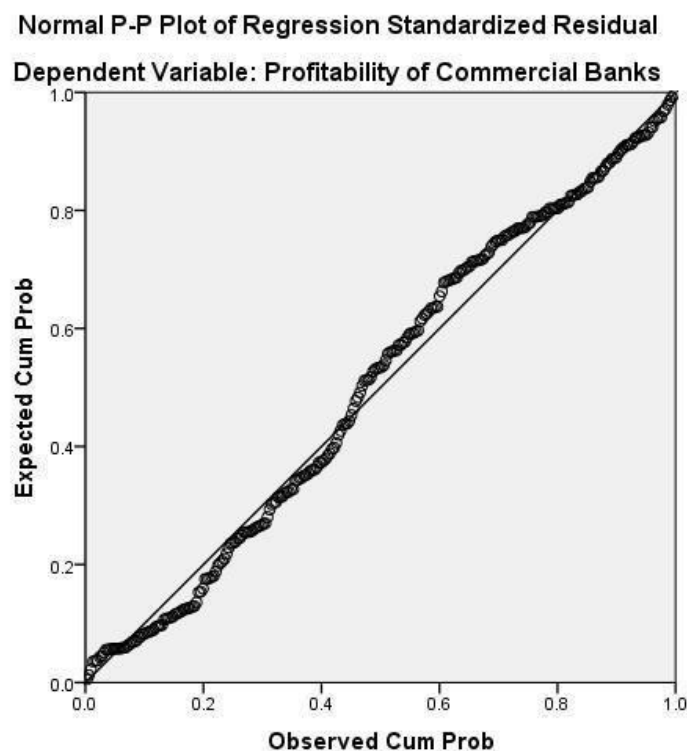
Source: Survey output

The histogram visually depicts the distribution of regression standardized residuals. The bell-shaped distribution indicates that the residuals are approximately normally distributed, which is a crucial assumption for many statistical tests and model inferences. This normality assumption is supported by the mean of the residuals being very close to zero ($-5.22\text{E-}16$) and the standard deviation being 0.993, suggesting a reasonable spread. The histogram, combined with the regression coefficients table, provides evidence that the model's assumptions are likely met, suggesting a good fit between the model and the data. However, it's important to note that this is a preliminary assessment and further analysis using other diagnostic plots and statistics is recommended for a comprehensive evaluation of the model's performance and assumptions.

4.4.3. Linearity

Linearity means the extent to which a variation in the dependent variable is linked to the variation in the predictor variables.

Figure 3: Linearity test



Source: Survey output

The Figure above displays no significant variation in the spread of the residuals as we look from left to right it is nearly all residuals lay on the linear straight line therefore; this indicates the association between the predictor variables and the dependent variable is linear.

The points in the plot generally follow the diagonal line, indicating that the distribution of the residuals is approximately normal. This is a good sign, as normality is a key assumption for many statistical tests and model inferences.

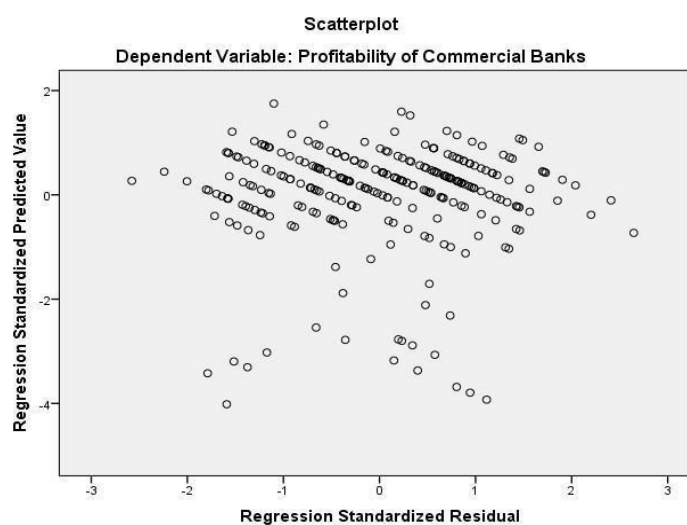
There are some minor deviations from the diagonal line, particularly in the tails (the upper and lower ends). This suggests that the distribution of the residuals might have slight deviations from perfect normality. These deviations could be due to a few outliers or other factors.

Overall, the Normal P-P Plot provides evidence that the residuals are approximately normally distributed, which is a positive indication for the model's validity. However, minor deviations from normality are observed, warranting further investigation to ensure the robustness of the model's results.

4.4.4. Homoscedasticity

Homoscedasticity is an assumption in regression analysis that the residuals at each phase of the independent variables have the same variations. Which means, at each point besides any predictor variable, the spread of residuals should be fairly constant.

Figure 4: Homoscedasticity test



Source: Survey output

The scatterplot shows a relatively random distribution of points with no clear pattern. This is a good indication that the model's assumption of homoscedasticity (constant variance of residuals) is likely met.

The lack of any distinct patterns or trends in the scatterplot suggests that the variance of the residuals is relatively constant across different levels of the predicted values. This is crucial for the validity of statistical tests and model inferences.

The random distribution of points supports the idea that the model is a reasonable fit for the data, as there are no obvious systematic deviations or patterns that would suggest a poor fit.

The scatterplot provides evidence that the model's assumption of homoscedasticity is likely met. This, along with the previously examined normality of residuals, suggests that the model is a reasonable fit for the data. However, further analysis is recommended to confirm the absence of influential outliers and to fully assess the model's overall performance.

4.5. Model Summary for Profitability of Commercial Banks

The model summary for the regression analysis examining the predictors of the Profitability of Commercial Banks is presented in Table 12.

Table 12: Model Summary for Profitability of Commercial Banks

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791 ^a	.626	.620	.35487
a. Predictors: (Constant), Service Excellence, ATM Transactions, Internet Banking Transactions, Mobile Banking Transactions				
b. Dependent Variable: Profitability of Commercial Banks				

Source: Survey output

The model demonstrates a strong correlation with an R value of 0.791, indicating a robust relationship between the independent variables and the dependent variable. The R Square value of 0.626 suggests that approximately 62.6% of the variance in the profitability of commercial banks can be explained by the predictors, which include Service Excellence, ATM Transactions, Internet

Banking Transactions, and Mobile Banking Transactions. The Adjusted R Square value of 0.620 accounts for the number of predictors in the model and confirms that the model remains effective even when adjusted for the sample size. The Standard Error of the Estimate is 0.35487, indicating the average distance that the observed values fall from the regression line. Overall, these results suggest that digitalization and various banking transaction methods significantly contribute to enhancing the profitability of commercial banks, highlighting the importance of these factors in the banking sector.

4.6. ANOVA for Profitability of Commercial Banks

The Analysis of Variance (ANOVA) results for the regression model examining the predictors of the Profitability of Commercial Banks are summarized in Table 13.

Table 13: ANOVA Summary for Profitability of Commercial Banks

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.589	4	14.147	112.337	.000 ^b
	Residual	33.877	269	.126		
	Total	90.465	273			
a. Dependent Variable: Profitability of Commercial Banks						
b. Predictors: (Constant), Service Excellence, ATM Transactions, Internet Banking Transactions, Mobile Banking Transactions						

Source: Survey output

The regression model shows a Sum of Squares for regression of 56.589 with 4 degrees of freedom (df), resulting in a Mean Square of 14.147. This indicates that the model explains a significant portion of the variance in profitability. The F-statistic is 112.337, which is highly significant with a p-value (Sig.) of 0.000, indicating that at least one of the predictors—Service Excellence, ATM Transactions, Internet Banking Transactions, or Mobile Banking Transactions—is significantly associated with the profitability of commercial banks. The Sum of Squares for residuals is 33.877 with 269 degrees of freedom, leading to a total sum of squares of 90.465 for the entire model.

These findings strongly support the hypothesis that digital banking services and operational excellence contribute positively to the profitability of commercial banks.

4.7. Coefficients for Predictors of Profitability

The coefficients for the regression model assessing the impact of various predictors on the Profitability of Commercial Banks are summarized in Table 14. The results provide insights into the relationship between each predictor and the dependent variable, with the Unstandardized Coefficients (B) indicating the amount of change in profitability associated with a one-unit change in each predictor, while the Standardized Coefficients (Beta) allow for comparison across predictors.

Table 14: Coefficients for Predictors of Profitability

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.016	.186		.086	.931
	ATM Transactions	.357	.050	.345	7.136	.000
	Mobile Banking Transactions	.206	.066	.199	3.112	.002
	Internet Banking Transactions	.161	.057	.164	2.836	.005
	Service Excellence	.215	.073	.227	2.936	.004
a. Dependent Variable: Profitability of Commercial Banks						

Source: Survey output

Among the predictors, ATM Transactions have the strongest positive effect on profitability, with an unstandardized coefficient of 0.357 (SE = 0.050) and a standardized coefficient (Beta) of 0.345. This indicates that for each unit increase in ATM transactions, profitability increases by approximately 0.357 units, and this effect is highly significant ($t = 7.136$, $p = 0.000$).

Mobile Banking Transactions also show a positive and significant relationship with profitability, with a coefficient of 0.206 (SE = 0.066) and a Beta of 0.199 ($t = 3.112$, $p = 0.002$). Similarly, Internet Banking Transactions contribute positively to profitability, with a coefficient of 0.161 (SE = 0.057) and a Beta of 0.164 ($t = 2.836$, $p = 0.005$). Lastly, the variable representing Service Excellence has a coefficient of 0.215 (SE = 0.073) and a Beta of 0.227, indicating its significant influence on profitability ($t = 2.936$, $p = 0.004$).

Overall, these results underscore the importance of digital banking services and operational excellence in enhancing the profitability of commercial banks, with all predictors showing statistically significant contributions to the model.

4.8. Hypotheses Testing

Table 15: Hypotheses testing

Hypothesis Number	Alternative Hypothesis	p-Value	Decision
1	ATM transactions significantly impact the profitability of commercial banks in Ethiopia.	0.000	Accepted
2	Mobile banking transactions significantly impact the profitability of commercial banks in Ethiopia.	0.002	Accepted
3	Internet banking transactions significantly impact the profitability of commercial banks in Ethiopia.	0.005	Accepted
4	Digitalization enhances operational excellence & service quality, thereby improving the profitability of commercial banks in Ethiopia.	0.004	Accepted

Source: Survey output

All alternative hypotheses (**H_a**) are accepted since their p-values are less than the significance level ($\alpha = 0.05$).

4.8.1. Related Studies and Findings

This study examined the impact of various electronic banking channels, including ATM, POS, and mobile banking, on the profitability of commercial banks. The findings indicated that the number of ATMs and POS terminals positively and significantly affected both Return on Assets (ROA) and Return on Equity (ROE). However, mobile banking was found to have a negative impact on profitability. The study concluded that enhancing ATM and POS services could lead to improved

profitability for banks, aligning with our findings that ATM transactions significantly impact bank profitability (Altaseb, 2020).

This research highlighted that an increased number of ATMs and POS systems positively influenced financial performance metrics such as ROA and ROE. The study found a significant positive association between ATM transactions and bank performance, while mobile banking transactions had an insignificant effect. This supports our thesis results indicating that digital banking services, particularly ATM transactions, are crucial for enhancing profitability in Ethiopian banks (GEBREGIORGIS, 2020).

This study focused on the relationship between electronic banking services (including ATMs, mobile banking, and internet banking) and the financial performance of selected commercial banks in Ethiopia. It found that ATM usage had a significant positive effect on ROA, while mobile banking showed mixed results. The overall conclusion emphasized that e-banking contributes positively to financial performance, consistent with our thesis results regarding the impact of digitalization on operational excellence and profitability (Qadire, 2019).

This research examined how digitization affects commercial bank profitability in Ethiopia, finding that ATM transactions significantly enhance profitability as measured by ROE. The study also noted that while digitalization improves service quality and operational efficiency, some aspects like internet banking user numbers had a negative impact. These findings resonate with your conclusion that digitalization enhances service quality and operational excellence, thereby improving bank profitability (Mekonnen M. , 2022).

This study found a significant relationship between electronic banking channels (including ATMs, mobile banking, and internet banking) and the profitability of commercial banks in Ethiopia. It reported that e-banking services improve operational reliability and reduce transaction costs, which aligns with your thesis findings regarding the positive impacts of digitalization on bank profitability (Animaw, 2020).

These studies collectively reinforce our thesis results by demonstrating that various aspects of electronic banking especially ATM transactions play a significant role in enhancing the profitability of commercial banks in Ethiopia through improved service quality and operational efficiency.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

The chapter discusses the summary, conclusions and drives recommendations based on the data findings analyzed and finally it provides suggestions for further research.

5.1. Summary of the Study

This thesis investigates the impact of digital banking services on the profitability of commercial banks in Ethiopia, focusing on key factors such as ATM transactions, mobile banking, internet banking, and the broader implications of digitalization on operational excellence and service quality. The study employs a quantitative research design, utilizing survey data collected from 274 respondents across various commercial banks in Ethiopia to analyze the relationships between these digital banking services and bank profitability.

The findings reveal that all forms of digital banking services significantly contribute to the profitability of commercial banks. Specifically, ATM transactions were found to have a strong positive impact, with a p-value of 0.000 indicating high statistical significance. Similarly, mobile banking transactions ($p = 0.002$) and internet banking transactions ($p = 0.005$) also demonstrated significant positive effects on profitability. Furthermore, the study highlights that digitalization enhances operational excellence and service quality, which in turn positively influences bank profitability, with p-values of 0.004 for both factors.

In general, this thesis contributes to the understanding of how digital banking services can enhance the financial performance of commercial banks in Ethiopia. It provides valuable insights for bank management and policymakers, emphasizing the need for continued investment in digital technologies to maintain competitiveness and drive profitability in an increasingly digital financial landscape. The findings suggest that as Ethiopian banks embrace digitalization, they can achieve greater operational efficiency and improved service quality, ultimately leading to enhanced profitability.

Moreover, the thesis offers practical recommendations for banks to leverage their digital platforms effectively. These include enhancing security measures to build customer trust, investing in user friendly interfaces for mobile and internet banking applications, and conducting regular training

for staff to improve service delivery. By adopting these strategies, banks can not only increase their profitability but also foster long-term customer loyalty in an evolving financial environment. Overall, this research underscores the critical role of digitalization in shaping the future of banking in Ethiopia and provides a foundation for further studies exploring the impact of emerging technologies on financial performance in developing economies.

5.2. Conclusion

This study has provided a comprehensive analysis of the impact of digital banking services on the profitability of commercial banks in Ethiopia. Through a detailed examination of various digital banking channels—specifically ATM transactions, mobile banking, and internet banking—the research has established a clear link between these services and enhanced financial performance. The findings demonstrate that all forms of digital banking significantly contribute to the profitability of banks, with ATM transactions showing the strongest positive correlation. The results indicate that digitalization not only improves operational efficiency but also enhances service quality, which is crucial in today's competitive banking environment. The significant p-values associated with each hypothesis confirm that as banks invest in digital technologies, they can expect to see substantial improvements in their profitability metrics, such as Return on Assets (ROA) and Return on Equity (ROE). Furthermore, the study highlights the importance of customer perceptions regarding convenience and security in driving the adoption of digital banking services. In light of these findings, it is evident that Ethiopian banks must prioritize the development and enhancement of their digital banking platforms. By doing so, they can meet the evolving expectations of customers while simultaneously improving their operational capabilities. The study also emphasizes the need for continuous investment in digital infrastructure and training programs to ensure that staff are equipped to provide high-quality service in a digital context. Moreover, this research contributes to the existing literature on electronic banking by providing empirical evidence from a developing country context. It underscores the transformative potential of digitalization in the banking sector and suggests that similar studies could be conducted in other emerging markets to further explore these dynamics.

In conclusion, this study affirms that embracing digital banking is not merely an option but a necessity for commercial banks in Ethiopia seeking to enhance their profitability and

competitiveness. As the financial landscape continues to evolve with technological advancements, banks that effectively leverage digital services will be better positioned to succeed in an increasingly digital economy. Future research could explore the long-term effects of digital banking on customer loyalty and market share, as well as investigate new technologies such as block-chain and artificial intelligence in relation to banking profitability.

5.3. Recommendations

Based on the findings of this study, several recommendations can be made to enhance the profitability of commercial banks in Ethiopia through the effective implementation and promotion of digital banking services:

1. Enhance Digital Banking Infrastructure:

- Banks should invest in upgrading their digital banking platforms, including ATMs, mobile banking applications, and internet banking systems. This includes ensuring that these platforms are user-friendly, secure, and capable of handling increased transaction volumes as customer adoption grows.

2. Focus on Customer Education and Awareness:

- To maximize the benefits of digital banking services, banks should implement comprehensive customer education programs. These initiatives can help customers understand how to use these services effectively, address security concerns, and highlight the convenience and efficiency of digital transactions.

3. Strengthen Security Measures:

- Given the importance of trust in digital banking, banks must prioritize robust security protocols to protect customer data and transactions. Regularly updating security measures and communicating these efforts to customers can enhance confidence in using digital services.

4. Leverage Data Analytics:

- Banks should utilize data analytics to gain insights into customer behavior and preferences regarding digital banking services. This information can guide the development of

personalized offerings and targeted marketing strategies that enhance customer engagement and satisfaction.

5. Expand Mobile Banking Services:

- As mobile banking has shown a significant positive impact on profitability, banks should consider expanding their mobile service offerings. This could include features such as mobile payments, budgeting tools, and integration with other financial services to provide a comprehensive banking experience.

6. Monitor Technological Trends:

- Banks should stay informed about emerging technologies in the financial sector, such as blockchain and artificial intelligence, which could further enhance their digital banking capabilities. Exploring partnerships with fintech companies may also provide innovative solutions that improve service delivery.

7. Regular Training for Staff:

- Continuous training programs for bank staff are essential to ensure they are well-equipped to assist customers with digital banking services. Knowledgeable staff can provide better support and foster a positive customer experience.

8. Conduct Ongoing Research:

- Future research should be conducted to monitor the evolving landscape of digital banking in Ethiopia. Studies focusing on customer satisfaction, loyalty metrics, and the long-term impact of digitalization on profitability will provide valuable insights for strategic decision making.

9. Policy Advocacy:

- Banks should engage with policymakers to advocate for regulations that support the growth of digital banking while ensuring consumer protection. Collaborative efforts can help create an enabling environment for innovation in the financial sector.

By implementing these recommendations, commercial banks in Ethiopia can strengthen their competitive position in the market, enhance customer satisfaction, and ultimately drive profitability through effective utilization of digital banking services.

5.4. Future Research Directions

Based on the findings of this study and the current landscape of digital banking in Ethiopia, several future research directions can be proposed to further explore the impact of digitalization on the banking sector:

1. Longitudinal Studies on Digital Banking Adoption:

- Future research could focus on longitudinal studies that track the adoption and impact of digital banking services over time. This would provide insights into how customer preferences evolve and how banks can adapt their strategies to meet changing demands.

2. Impact of Emerging Technologies:

- Investigating the effects of emerging technologies such as Artificial Intelligence (AI), Block-chain, and Robotic Process Automation (RPA) on banking efficiency and profitability could yield valuable insights. Understanding how these technologies can be integrated into existing systems may provide a competitive edge for banks.

3. Customer Experience and Satisfaction:

- Further studies could delve deeper into customer experience and satisfaction with digital banking services. Research could explore specific factors that influence customer loyalty and retention in the context of digital banking, providing banks with actionable insights to improve service delivery.

4. Barriers to Digital Banking Implementation:

- Research focused on identifying and analyzing the barriers that hinder the effective implementation of digital banking services in Ethiopia would be beneficial. This could include examining infrastructure challenges, regulatory issues, and cybersecurity concerns that banks face in their digital transformation journeys.

5. Comparative Studies Across Regions:

- Conducting comparative studies between Ethiopian banks and those in other developing countries could highlight best practices and innovative strategies that have been successful elsewhere. Such research could inform policy recommendations and strategic initiatives for Ethiopian banks.

6. Interbank Competition in Digital Finance:

- Given the competitive nature of the banking sector, studies examining interbank competition in the digital finance space could provide insights into how banks can differentiate themselves through innovative digital offerings.

7. Impact of Financial Literacy on Digital Banking Usage:

- Exploring the relationship between financial literacy levels among customers and their usage of digital banking services would provide valuable insights for banks aiming to enhance customer engagement through targeted educational programs.

By pursuing these research directions, scholars can contribute to a deeper understanding of the dynamics at play in Ethiopia's evolving digital banking landscape, ultimately supporting the development of more effective strategies for enhancing profitability and customer satisfaction within commercial banks.

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Appendix I



ADDIS ABABA UNIVERSITY SCHOOL OF BUSINESS AND ECONOMICS MBA PROGRAM IN FINANCE

QUESTIONNAIRE ON IMPACT OF DIGITAL BANKING ON PROFITABILITY OF COMMERCIAL BANKS IN ETHIOPIA.

Dear respondents,

I would like to express my sincere appreciation for your time, candid and prompt response.

This questionnaire is designed for partial fulfillment for the requirement of Master in Business Administration. This study is conducted to assess the Impact of Digital Banking on Profitability in the banking business in Ethiopia, the case of commercial banks in Ethiopia. It will mainly assess the impact of adopting digital banking with the intent and strategy delivering quality service and maintaining operational excellence. As a strategic theme of the banks, this study is believed to determine the effectiveness of investing on digital banking for the profitability of the Banks and provide information to the bank's stake holders to make further decision whether to invest more on technology or not. The information collected will be kept confidential and used to serve the academic purpose only.

So kindly, spare a few minutes of your valuable time to fill up the questionnaire.

Thank You!

ALHAMDU ABDELA

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General instructions

- Writing your name on the questionnaire is not required
- Please tick (✓) against the appropriate box

Which of the following bank do you work?

- ☐ Commercial Bank of Ethiopia
- ☐ Zemen Bank S.C
- ☐ Dashen Bank S.C
- ☐ Awash Bank S.C BOA S.C

Part I. Background information

1. Gender of Respondents

Male []

Female []

2. Educational qualification

Diploma [] Degree [] Masters and above []

3. Current professional position

Officer [] Senior-officer [] Manager []

4. Working experience in Banks

Less than 2years [] 2-5 years [] 6-10 years [] More than 10 years
[]

5. Digital banking services/products provided at your bank/at your respective branch /it is possible to tick more than once)

ATM []

POS []

Mobile banking []

Internet Banking []

ITM /Case of BOA/ []

Mobile Wallet /Money []

Part II : Questions related to the Independent Variables

Direction: Please read the following items and respond by indicating your degree of agreement on each statement on the five-point Likert scale;

Where: 1- Strongly Disagree 2- Disagree 3- Neutral 4- Agree 5-Strongly Agree

Please indicate your choice by putting tick sign (√)

S.Nº	ATM Transactions	1	2	3	4	5
1.	I frequently use ATM transactions for my banking needs.					
2.	The availability of ATMs has improved my banking experience.					
3.	ATM transactions are more convenient than visiting a bank branch.					
4.	I believe that ATM transactions have positively impacted the profitability of my bank.					
5.	I feel secure when conducting transactions at ATMs.					
	Mobile Banking Transactions					
6.	I regularly use mobile banking applications for transactions.					
7.	Mobile banking has made managing my finances easier.					
8.	The features offered by mobile banking applications meet my needs effectively.					
9	I believe that mobile banking transactions contribute to the profitability of my bank.					
10	I trust the security measures in place for mobile banking transactions.					
	Internet Banking Transactions					
11.	I often use internet banking for my financial transactions.					

12.	Internet banking provides me with sufficient information about my accounts.					
13.	I find internet banking to be user-friendly and efficient.					
14.	I believe that internet banking transactions enhance the profitability of my bank.					
15.	The security measures for internet banking are satisfactory.					
	Service Excellence					
16.	The customer service provided by my bank is responsive and helpful.					
17.	My bank effectively addresses any issues or concerns I have regarding digital services.					
18.	The quality of service I receive enhances my overall satisfaction with my bank.					
19.	I believe that high service excellence positively influences the profitability of my bank.					
20.	My bank continuously seeks feedback to improve its digital services.					

Part III: Questions related to the Dependent Variable

	Profitability of Commercial Banks	1	2	3	4	5
21.	I perceive that my bank has become more profitable due to digitalization efforts.					
22.	The introduction of digital services has led to an increase in customer base for my bank.					
23.	I believe that digital transactions have reduced operational costs for banks.					
24.	The profitability of banks is significantly influenced by their digital service offerings.					
25.	My bank's financial performance has improved as a result of embracing digitalization.					

Thank You!!!

