

ADDIS ABABA UNIVERSITY

COLLAGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

THE EFFECT OF DIGITAL BANKING SERVICE ON OPERATIONAL EFFICIENCY THE CASE OF COMMERCIAL BANKS IN ETHIOPIA

A THESIS SUBMITTED IN PARCIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ACCOUNTING AND FINABCE

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Addis Ababa Ethiopia

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DECLARATION

I hereby declare that this thesis is my original work prepared in partial fulfillment of the requirements for the Master of Accounting degree under the supervision of Dr.Abebe Yitayew. To the best of my knowledge, this work does not contain any material previous lyrics published or written by another person, nor any material submitted for the award of any degree or diploma at any other University or institution, except where proper acknowledgment and references have been clearly indicated in the text.

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ENDORSEMENT

This thesis has been submitted to Addis Ababa University, College of Business & Economics for examination with my approval as a University Advisor.

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Addis Ababa University
Addis Ababa; Ethiopia

ABREVATIONS

AEC	Allocative efficiency changes
ATM	Automated Teller Machine
CBE	Commercial Bank of Ethiopia
COGS	Cost of Goods Sold
GDP	Gross Domestic Product
IB	Internet Banking
KYC	Know your customer
MB	Mobile Banking
MW	Mobile Wallet
NBFC	Non-banking financial company
OE	Operational efficiency
POS	Point of Sale
RBI	Reserve bank of India
ROA	Return on Asset
ROE	Return on Equity
SMS	Short Message services

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ABSTRACT

The primary objective of this study was to examine the effect of digital banking services on the operational efficiency of banking services in Ethiopia, with particular emphasis in Commercial banks in Ethiopia. The study employed purposive sampling techniques to collect data from employees and existing customers of commercial banks. The collected data were analyzed using descripitive statistical methods, including frequencies and percentages. The findings of the study revealed that a large proportion of customers receive immediate account notifications through digital banking platforms. In addition, the use of digital banking products such as Automated Teller Machines, Mobile banking, and Internet banking significantly reduced customer congestion in bank branches band improved the efficiency of employees in performing banking activities. Based on the findings, the study concludes that the adoption of modern banking technologies has substantially enhanced operational efficiency within commercial banks. Consequently, the study recommends that banks should continuously improve the quality of their digital service to achieve operational efficiency. Furthermore, since digital banking technologies positively contribute to service efficiency, commercial banks should increase their investment in digital banking infrastructure and innovations. The study also recommends that banks should give greater attention to challenges such as power interruptions, telecommunication network failures, and difficulties customers face while using digital banking products, as these problems may negatively affect banking operations and lead to financial losses if not properly managed.

KEY TERMS: - Digital banking; Operational efficiency; Commercial banks

CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Banks play a vital role in the modern financial system by mobilizing deposits from savers and providing credit to investors and consumers. Through these intermediary functions, banks facilitate the flow of funds, allocate resources efficiently, provide liquidity and payment services, and support economic growth and development. The efficiency of banking operations is particularly important because inefficient resource allocation, poor risk management, and operational weaknesses can contribute to financial instability and economic disruption (Allen et al., 2019; Ghannadian & Goswami, 2004). Therefore, a stable and efficient banking sector is essential for sustainable economic growth, poverty reduction, and improved societal welfare (Bayer et al., 2021).

In developing countries, where financial markets are often underdeveloped, the banking sector plays an even greater role in connecting savers and borrowers. The adoption of digital technologies has strengthened this role by improving the efficiency and security of financial intermediation. According to Levine (1998), efficient financial systems contribute significantly to economic growth by reducing financial risks and enhancing the allocation of capital. Digital transformation enables banks to improve productivity, reduce operational costs, enhance service delivery, and increase profitability. Consequently, technologically advanced and profitable banks are better positioned to meet customer needs, improve stakeholder value, and minimize the likelihood of financial failure (Pruteanu-Podpiera et al., 2016). In this context, banking efficiency refers to the ability of banks to optimally utilize available resources to maximize output while minimizing operational costs (Patnaik, 1997; Gilhespy, 1999; Mullahs et al., 2023).

The banking industry worldwide has experienced significant transformation due to rapid advancements in digital technologies. Digital banking services such as mobile banking, internet banking, automated teller machines (ATMs), and digital payment platforms have fundamentally changed how financial services are delivered.

These technologies have improved operational efficiency, customer convenience, transaction speed, and service accessibility. In Ethiopia, the banking sector has increasingly adopted

digital banking services to enhance competitiveness and improve customer satisfaction. The Commercial Bank of Ethiopia (CBE), the largest bank in the country, has invested heavily in digital banking technologies, including mobile banking, internet banking, ATM services, and digital payment systems. These innovations have enabled the bank to process large volumes of transactions electronically while reducing dependence on traditional branch-based operations.

The Ethiopian banking industry continues to expand digital banking services to reduce operating costs, improve service quality, and increase profitability. Digital banking allows customers to conduct transactions such as fund transfers, bill payments, account inquiries, and purchases at any time and from any location. Despite substantial investments by commercial banks in digital banking infrastructure, the level of adoption and utilization remains lower than expected. Cashless payment systems are still underdeveloped, particularly in rural areas and among segments of the population without access to banking services. As a result, many customers continue to rely heavily on traditional cash-based transactions.

To remain competitive and support economic modernization, banks must not only provide digital banking services but also encourage customers to actively adopt and utilize them. Electronic payment systems offer significant advantages in terms of convenience, efficiency, speed, and accessibility (Harcourt, 2021). Therefore, expanding the adoption and effective use of digital banking services is essential for improving the operational efficiency of commercial banks and supporting the broader economic development of Ethiopia. Against this background, this study aims to examine the effect of digital banking services on the operational efficiency of commercial banks in Ethiopia, with particular emphasis on the role of mobile banking, internet banking, ATM services, and digital payment systems in improving banking performance and service delivery.

1.2 Statement of the Problem

The banking sector has undergone substantial transformation due to advances in information and communication technology, leading to the rapid adoption of digital banking services. Banks increasingly utilize digital technologies such as mobile banking, internet banking, ATMs, and digital payment systems to improve service delivery, respond to changing customer needs, enhance competitiveness, and reduce operational costs (Harcourt,

2021). Digital transformation has also improved customer engagement and enabled banks to provide financial services beyond geographical and time constraints.

Banking efficiency is essential for ensuring financial stability, improving profitability, and supporting economic growth. Efficient banks are better able to allocate resources, manage risks, withstand economic shocks, and provide quality services to customers (Diallo, 2018; Waheed & Younus, 2010). Consequently, improving operational efficiency has become a key objective for financial institutions worldwide. Digital banking is widely recognized as a tool that can enhance operational efficiency through faster transaction processing, improved service accessibility, reduced operational costs, and increased customer convenience.

Despite the growing adoption of digital banking technologies in Ethiopia, the level of utilization remains below expectations. Challenges such as limited digital literacy, inadequate infrastructure, network interruptions, security concerns, and continued reliance on traditional banking methods hinder the effective use of digital banking services. Although commercial banks continue to invest significant resources in digital technologies, concerns regarding service interruptions, customer dissatisfaction, and operational inefficiencies remain prevalent.

Furthermore, while several studies have examined digital banking adoption and banking performance, limited empirical evidence exists regarding the effect of digital banking services on the operational efficiency of commercial banks in Ethiopia. Most previous studies have focused on customer adoption, technology acceptance, or electronic payment systems, with insufficient attention given to how digital banking influences operational efficiency. This creates a knowledge gap that requires further investigation.

Therefore, this study seeks to examine the effect of digital banking services on the operational efficiency of commercial banks in Ethiopia. Specifically, it aims to assess how digital banking channels contribute to improving service delivery, transaction speed, resource utilization, and overall operational efficiency while identifying the challenges that may affect their effectiveness.

1.3. Objectives of the Study

1.3.1 General Objective:

The general objective of this study is to investigate the impact of digital banking service on the efficiency of Ethiopian banking operation the case of Commercial Banks in Ethiopia.

1.3.2 Specific Objective

- To assess the extent of digital banking service adoption in the Commercial Banks in Ethiopia.
- To evaluate the effect of ATM service on operational efficiency.
- To examine the influence of Mobile banking on transaction speed, customer service delivery and service availability.
- To examine the influence of POS on transaction speed and Service availability.
- To evaluate the effect of IB on service availability, reliability and transaction speed.
- To analyze the relationship between digital banking and employee productivity.

1.4. Research Questions

To this end, we propose a series of research questions that will be addressed throughout this paper:

- To what extent have commercial banks in Ethiopia adopted digital banking services?
- How do ATM services affect the operational costs of the bank?
- What is the impact of Mobile Banking on the speed and efficiency of customer transactions?
- To what extent does Point of Sale (POS) banking influence transaction speed and service availability in commercial banks?
- To what extent does Internet Banking (IB) affect service availability, reliability, and transaction speed in commercial banks?
- How does digital banking influence employee productivity and workload?

1.5. Scope of the Study

This study focused on examining the effect of digital banking services on the operational efficiency of commercial banks in Ethiopia. Specifically, the study assessed the influence of major digital banking channels, including mobile banking, Internet banking, automated teller machine (ATM) services, and point-of-sale (POS) services, on operational efficiency indicators such as service availability, transaction speed, reliability, customer satisfaction, and employee productivity.

1.6. Limitation of the Study

Despite efforts to ensure the quality and reliability of the study, several limitations were encountered. First, the study was limited to selected commercial banks and branches, which may affect the generalizability of the findings to all banks operating in Ethiopia. Second, the study relied primarily on questionnaire responses from employees and customers. Therefore, the findings may be affected by respondents' perceptions, honesty, and understanding of the questions. Third, constraints related to time, budget, and accessibility limited the number of respondents and branches included in the study. As a result, the study could not cover all commercial banks across the country. Finally, the study focused only on selected digital banking services (mobile banking, Internet banking, ATM, and POS) and operational efficiency indicators. Other factors that may influence bank efficiency were not examined and were beyond the scope of this research.

1.7. Organization of the Study

The study consists of five chapters. The first chapter presents the introduction of the study. The second chapter discusses the review of related literature. The third chapter describes the research methodology employed in the study. The fourth chapter presents, analyzes, and interprets the collected data. Finally, the fifth chapter provides the summary, conclusions, and recommendations of the study.

CHAPTER TWO

2 LITERATURE REVIEW

In the previous chapter, the main problems and objectives addressed in this study were clearly stated. This chapter presents the related literature relevant to the study. The literature review is organized into two major sections: the theoretical review and the empirical review. The theoretical review discusses the concepts, roles, and theories related to digital banking, as well as the variables believed to influence the operational efficiency of banks. The empirical review examines previous studies conducted on the impact of digital banking on the operational efficiency of commercial banks.

2.1 Digital Banking

2.1.1 Definition of Digital Banking

Digital banking refers to a system of electronic banking through which customers can access financial services using various digital channels. These services are delivered through digital platforms, particularly via the internet. The growing expansion of e-commerce has further increased the demand for online banking services, as digital banking plays a crucial role in supporting activities such as online shopping and electronic marketing. In simple terms, digital banking, also known as electronic banking, refers to the delivery of financial services to customers through digital or electronic means (H. Sharma and S. Aggarwal, 2023).

Digital banking also refers to the digitization of traditional banking activities that were previously available only through physical bank branches. It involves the use of online platforms and technological tools that enable customers to perform banking activities without physically visiting a bank branch. These services include mobile banking, internet banking, ATM services, and electronic fund transfers. Previous studies have shown that digital banking improves accessibility, convenience, transparency, and customer satisfaction within the financial sector (Al-Smadi, 2012; Pikkarainen et al., 2004).

2.1.2 Digital Banking landscape in Ethiopia

Ethiopia, Africa’s second most populous country, is undergoing rapid economic expansion and advancing toward digital transformation. As one of the pioneering African

nations implementing large-scale digital reforms, Ethiopia is increasingly adopting technology to promote growth across major sectors such as agriculture, tourism, manufacturing, and particularly fintech and financial services. This transformation provides significant opportunities to modernize the country's payment ecosystem, thereby enhancing financial inclusion and expanding economic participation across different sectors of the economy.

In recent years, Ethiopia has made notable progress in the adoption of digital financial services. During the 2023/24 fiscal year, the country recorded approximately 9.7 trillion Birr in digital transactions, representing a 129 percent increase compared to the previous period. In addition, the number of digital accounts across various financial platforms reached 204 million nationwide. The implementation of interoperability frameworks among banks and financial service providers further improved the efficiency, accessibility, and security of digital transactions for customers.

2.1.3 Digital Banking Forms

2.1.3.1 Automated Teller Machines (ATM)

Automated Teller Machines (ATMs) are one of the most widely recognized and accepted forms of electronic banking services, providing customers with convenient access to banking services 24 hours a day, seven days a week. ATMs allow customers to perform various transactions, including cash withdrawals, deposits, fund transfers, and balance inquiries, without the assistance of bank staff (Bishnoi, 2013). Banks introduced ATMs primarily to improve operational efficiency, reduce service costs, and strengthen their competitive position by offering faster and more accessible services (AbdEl-Aziz et al., 2014). By placing ATMs in strategic locations such as shopping centers, hotels, supermarkets, and marketplaces, banks enhance customer convenience and accessibility. Furthermore, ATM cards offer greater security than carrying cash, as access to funds is protected through a Personal Identification Number (PIN), reducing the risk of unauthorized transactions.

2.1.3.2 Point of Sale (POS)

A Point of Sale (POS) is a physical or virtual platform where transactions between buyers and sellers are completed, enabling customers to purchase goods and services and

make payments electronically. Commercial banks provide POS systems to allow merchants to accept payments through various local and international payment cards, including Visa, Mastercard, UnionPay, and American Express. POS terminals have become an essential business tool due to their efficiency, convenience, and ability to facilitate secure electronic payments. With technological advancements, modern POS systems have evolved beyond traditional card processing to support contactless payments, mobile wallets, and other digital payment methods through electronic POS (e-POS) systems, making transactions faster, more flexible, and more convenient for both merchants and customers (Nambisan, 2021).

2.1.3.3. Internet Banking (IB)

Internet Banking (IB) is a digital banking service that enables customers to access banking products and services through web browsers or mobile applications from any location with an internet connection. It serves both individual and corporate customers by allowing them to perform various transactions, such as checking account balances, transferring funds, paying bills, and managing accounts without visiting a bank branch. Compared to traditional banking methods, internet banking is more convenient, time-saving, and cost-effective for customers (Hasan, 2015). It also provides significant benefits to banks by reducing operational costs, improving service delivery, streamlining business processes, expanding market reach, increasing customer loyalty, and attracting new customers. As a self-service platform, internet banking enhances accessibility and efficiency while supporting the overall operational performance of financial institutions.

2.1.3.4 Mobile Banking (MB)

Mobile Banking (MB) refers to the use of mobile devices such as smartphones, tablets, mobile phones, and personal digital assistants (PDAs) to access banking services and conduct financial transactions linked to a customer's bank account (Saleem & Rashid, 2011). Unlike internet banking, mobile banking primarily relies on specialized mobile applications provided by financial institutions, enabling customers to perform banking activities conveniently through their devices (Kingoo, 2011). Mobile banking has transformed the financial sector, particularly in developing countries, by improving the accessibility, efficiency, and convenience of financial services (Mabwai, 2016). Through mobile banking, customers can check account balances, transfer funds, pay bills, receive instant transaction

notifications, and access banking services anytime and anywhere without visiting a bank branch, thereby enhancing customer convenience and operational efficiency.

2.1.3.5 Mobile Wallet (MW)

Mobile wallets are digital payment platforms that allow users to store funds electronically and make payments to multiple merchants through mobile devices without carrying physical cash. They also enable users to transfer funds, withdraw money to bank accounts, or convert digital balances into cash when needed. By providing fast, convenient, and secure transactions, mobile wallets enhance the efficiency of financial services and promote the adoption of digital financial systems and cashless payment methods.

2.1.3.6 Virtual Banking (ITM)

Interactive Teller Machines (ITMs), also known as virtual teller machines, are advanced banking systems that combine the self-service functions of ATMs with live teller assistance. ITMs enable customers to perform transactions such as cash withdrawals, deposits, check processing, identification verification, and receipt generation while communicating in real time with a remote bank representative through video, voice, or chat services. Unlike traditional ATMs, ITMs provide a more personalized banking experience by maintaining human interaction during transactions. By extending banking services beyond normal branch hours and improving customer convenience, ITMs enhance service accessibility and operational efficiency (Portal.BankofAbyssinia.com).

2.1.3.7 Credit/Debit Cards

Credit cards and debit cards are electronic payment instruments that enable customers to make convenient and efficient purchases both in stores and online. Debit cards allow users to pay directly from their bank accounts, while credit cards enable customers to borrow funds from a financial institution up to a specified credit limit and repay the amount later, usually with interest. Both cards support cashless transactions, improve transaction speed, accessibility, and convenience, and play an important role in the development of digital payment systems. However, credit cards generally offer stronger fraud protection and consumer security features than debit cards (Cussen, 2021).

2.2. Factors that affects Digital Banking adoption

The major challenges affecting the development and adoption of digital banking services include the following:

Infrastructure Challenges:

For a country to successfully adopt and expand digital technology, adequate infrastructure must be available to support its growth and utilization. However, in many developing countries such as India and Ethiopia, digital infrastructure is still at a developing stage, which creates significant barriers to the expansion of digital banking services. One of the major challenges is limited access to reliable and widespread Internet connectivity, particularly in rural areas. In Ethiopia, insufficient Internet access and inadequate technological infrastructure continue to hinder the effective adoption and utilization of digital banking services.

Cyber security and Privacy Risks:

The openness of the Internet makes digital financial transactions vulnerable to cyber threats such as hacking, unauthorized access, identity theft, and data exploitation. As incidents of cybercrime continue to increase, even well-established financial institutions have become targets of cyber-attacks. These security concerns reduce customer confidence in the safety and reliability of digital banking systems. Similar challenges are increasingly evident in Ethiopia, where concerns regarding cybersecurity and privacy protection remain major obstacles to customer adoption of digital banking services.

Regulatory and Compliance Challenges:

The banking sector operates under strict regulatory frameworks governing areas such as capital adequacy, asset recognition, investment requirements, and bankruptcy regulations. However, applying these traditional regulations to digital banking services is often difficult due to the rapidly evolving nature of financial technologies. Regulatory authorities continue to develop frameworks to address emerging digital financial services, but clear and comprehensive regulations are still lacking in many countries. Additionally, certain regulations, such as Know Your Customer (KYC) requirements, often require physical

interaction between customers and banks, which may limit the operation of fully digital banking systems.

Legal and Technological Challenges:

Rapid technological advancements in the banking sector have introduced innovative financial products, services, and delivery channels. However, these developments also require updated legal interpretations and regulatory adjustments regarding issues such as electronic signatures, digital authentication, electronic permissions, and online transactions. Existing legal frameworks may not adequately address modern digital banking technologies, making it necessary for governments and regulatory bodies to continuously revise laws and policies in line with technological advancements.

2.3 Operational Efficiency

2.3.1 Overview of Operational Efficiency

Operational efficiency refers to an organization’s ability to achieve its objectives while minimizing operating costs through the effective use of people, processes, and technology. Organizations that successfully integrate these resources can improve productivity, enhance service quality, and maximize output using available resources efficiently (Shawk, 2008). In a broader business context, operational efficiency involves delivering products or services with minimal waste, reducing unnecessary costs, improving workflows, and ensuring that activities are performed in a timely and cost-effective manner (Alice Gomstyn & Alexandra Jonker, 2024).

In today's highly competitive business environment, operational efficiency has become a critical factor for organizational success across industries, including the financial sector. Efficient organizations are better able to provide high-quality products and services at lower costs while maintaining profitability and improving overall performance. The savings generated through efficient operations can be reinvested in new opportunities and value-adding activities. According to Mills and Schumann (1985), organizations with higher operational efficiency are more likely to sustain stable output levels and achieve superior performance compared to less efficient competitors. Therefore, operational efficiency plays a vital role in enhancing productivity, competitiveness, profitability, and long-term sustainability.

2.3.2 Operational Efficiency in Banks

Efficiency and productivity are closely related concepts that describe how effectively resources are utilized to generate outputs. Productivity is generally defined as the ratio of outputs to inputs, while efficiency refers to maximizing the use of available resources to achieve higher performance with minimum inputs (Lovell, 1993; Hayat, 2011). An organization is considered efficient when it produces greater output and profitability while minimizing operational costs. Therefore, efficiency measurement focuses on evaluating how effectively organizations utilize their resources to maximize performance and achieve their objectives (Othman et al., 2016).

In the banking sector, operational efficiency refers to the ability of banks to utilize their resources effectively to deliver high-quality financial services at lower operational costs while maintaining regulatory compliance. Key indicators of operational efficiency include reduced transaction processing time, lower operating costs, improved customer service, increased transaction volume, fewer manual errors, and efficient utilization of human resources. Efficient banks contribute to economic growth by mobilizing savings and allocating financial resources to productive sectors of the economy. Conversely, inefficient banks may hinder economic development through poor resource allocation. As noted by Athanasoglou et al. (2008) and Beck et al. (2010), an efficient banking system plays a crucial role in enhancing productivity, supporting economic growth, and improving overall social welfare.

2.3.3 Types of efficiency of banks

2.3.3.1 Cost efficiency

Cost efficiency refers to a bank's ability to minimize the cost of producing a given level of output while utilizing available resources effectively. A bank is considered cost-efficient when it uses inputs at the lowest possible cost and generates maximum output under similar operating conditions. According to Sardar et al. (2013), cost efficiency involves achieving minimum production costs while maximizing output with limited resources. In the banking sector, cost efficiency is important because it improves profitability, enhances competitiveness, and enables banks to deliver services more effectively.

One of the key components of cost efficiency is allocative efficiency, which refers to a bank's ability to use inputs in the most cost-effective proportions based on their relative prices. A bank achieves allocative efficiency when it allocates resources optimally to minimize production costs while maintaining the desired level of output. According to Qayyum and Khan (2010), allocative efficiency is achieved when an organization selects the optimal combination of inputs at given input prices, resulting in the lowest possible cost of production.

Another important component is technical efficiency, which refers to the ability of an organization to maximize output from a given amount of inputs or produce a given level of output using the minimum possible resources. Introduced by Koopmans (1951), technical efficiency measures how effectively resources such as labor, capital, technology, and time are utilized to achieve maximum productivity. In banking, technical efficiency can be enhanced through effective use of technology, automation, skilled personnel, and streamlined processes. According to Hayat (2011) and Othman et al. (2016), high technical efficiency reflects strong managerial capability and effective resource utilization. Therefore, a bank is considered fully cost-efficient when it achieves both allocative and technical efficiency, enabling it to provide banking services at the lowest possible cost while maximizing output, productivity, and profitability.

2.3.3.2 Scale efficiency

Scale efficiency refers to an organization's ability to operate at an optimal size or activity level that maximizes output while minimizing average costs. According to Othman, Mohd-Zamil, Rasid, Vakilbashi, and Mokhber (2016), inefficiency occurs when goods or services are produced either below or above the optimal scale of operation. In the banking sector, scale efficiency enables banks to spread fixed costs, such as technology investments, branch networks, and administrative expenses, across a larger volume of transactions and services, thereby reducing average costs and improving profitability. Banks operating at the optimal scale can utilize resources more effectively, enhance operational performance, and achieve sustainable growth, making scale efficiency an important component of overall operational efficiency.

2.3.3.3 Price efficiency.

Price efficiency refers to a bank's ability to provide high-quality financial services at reasonable and competitive costs while maintaining profitability. Efficient banks can offer faster, more reliable, and cost-effective services, which enhances customer satisfaction and loyalty. From the perspective of shareholders and other stakeholders, efficiency supports sustainable growth, stable returns, and improved organizational performance. In a highly competitive financial environment, efficient banks are better positioned to maintain market share and achieve long-term success, whereas inefficient banks may struggle to compete effectively. Therefore, improving efficiency remains a key priority for bank managers seeking to enhance competitiveness and overall performance.

Key Strategies for Improving Operational Efficiency in Banking

1. Process Streamlining

Process streamlining is a fundamental strategy for improving operational efficiency in banking. It involves identifying and eliminating unnecessary procedures, bottlenecks, and redundancies in activities such as loan processing, account opening, customer service, and transaction handling. By optimizing workflows and adopting automation and digital technologies, banks can reduce delays, minimize errors, lower operational costs, and improve service quality and productivity.

2. Technology Adoption

Technology adoption is another key driver of operational efficiency. The use of digital banking platforms, artificial intelligence (AI), machine learning, cloud computing, and automation helps banks streamline operations, reduce manual work, and enhance service delivery. These technologies enable faster transaction processing, improved decision-making, greater customer convenience, and more efficient resource utilization, allowing banks to remain competitive in an increasingly digital environment.

3. Resource Optimization

Resource optimization focuses on the effective utilization of human, financial, technological, and physical resources to maximize productivity while minimizing costs.

Proper allocation of employees, efficient management of branch networks and infrastructure, and strategic use of digital channels help improve service delivery and organizational performance. Effective resource utilization also supports profitability and sustainable growth by directing resources toward value-adding activities.

4. Risk Management

Risk management is essential for maintaining operational efficiency and organizational stability. It involves identifying, assessing, monitoring, and mitigating risks such as credit risk, operational risk, liquidity risk, market risk, cybersecurity risk, and compliance risk. A strong risk management framework helps reduce financial losses, prevent service disruptions, improve decision-making, ensure regulatory compliance, and maintain customer confidence, thereby enhancing overall banking performance.

5. Focus on Customer Experience

Focusing on customer experience is equally important for improving operational efficiency and achieving long-term success. Banks can enhance customer satisfaction by providing convenient, fast, and personalized services through digital banking platforms, mobile applications, internet banking, and automated support systems. Improved customer experience increases loyalty, retention, and the bank's competitive advantage while supporting sustainable business growth and overall organizational performance.

Benefits of Operational Efficiency

Operational efficiency provides several important benefits for banks, including reduced operating costs, increased profitability, and enhanced customer satisfaction. By utilizing resources effectively, minimizing waste, and streamlining business processes, banks can lower expenses related to labor, infrastructure, administration, and transaction processing. The adoption of digital technologies and automation further reduces operational costs while improving service delivery. Cost savings generated through efficient operations can be redirected toward innovation, business expansion, and other value-adding activities, thereby increasing profitability and improving overall financial performance. In addition, efficient processes enable banks to provide faster, more reliable, and higher-quality services, which improves customer satisfaction, loyalty, and retention.

Operational efficiency also strengthens risk management and enhances a bank's competitive advantage. Efficient internal controls, monitoring systems, and decision-making processes help banks identify and mitigate risks, reduce operational errors, ensure regulatory compliance, and minimize financial losses. Furthermore, efficient banks can offer better-quality services at lower costs, respond more quickly to changing customer needs, and introduce innovative financial products. These advantages improve market competitiveness, support sustainable growth, and contribute to the long-term success and stability of banking institutions.

2.3.4 Operational Efficiency of Employees

Operational efficiency in the banking sector encompasses several interconnected dimensions that collectively contribute to effective, streamlined, and productive banking operations (Grazioli et al., 2000). These dimensions influence a bank's ability to deliver quality services, utilize resources efficiently, and maintain sustainable performance in a competitive financial environment.

First, operational efficiency involves employees performing their assigned responsibilities accurately, promptly, and effectively. This ensures the smooth processing of financial transactions, efficient management of customer accounts, and timely responses to customer inquiries and service requests (Berger & Humphrey, 1997; Coshall, 2011). Efficient employee performance reduces delays, minimizes operational errors, and improves overall service quality.

Second, efficient utilization of resources is a fundamental component of operational efficiency. Employees and management must make optimal use of available resources, including time, technology, capital, and human resources, to minimize waste and maximize productivity (Guerard et al., 2010; Mester, 1996). This includes effective workforce scheduling, proper allocation of tasks, and maximizing the utilization of technological infrastructure to improve operational outcomes.

Third, in the modern banking environment, operational efficiency increasingly depends on employees' ability to adapt to and effectively utilize digital technologies. The adoption and effective use of online banking platforms, customer relationship management (CRM) systems, digital payment systems, and data analytics tools are essential for enhancing

productivity, improving decision-making, and delivering superior customer experiences (Sadi & Muhanna, 2013; Pikkarainen et al., 2004). Digital technologies enable banks to automate routine processes, reduce transaction costs, and provide services more efficiently.

Finally, operational efficiency encompasses compliance with regulatory requirements, industry standards, and ethical principles. Banks must ensure that their operations adhere to applicable laws, regulations, and governance frameworks while effectively managing operational, financial, and compliance risks (Jha & Gupta, 2016). Strong compliance systems not only safeguard the integrity of banking operations but also strengthen customer trust and institutional stability.

Therefore, operational efficiency in banking is a multidimensional concept that includes effective employee performance, optimal resource utilization, technological adaptability, and regulatory compliance. Together, these dimensions contribute to improved productivity, cost reduction, enhanced customer satisfaction, and sustainable organizational performance.

2.3.5 Measurement of operational efficiency at Banks

Operational efficiency is commonly measured by the relationship between outputs and inputs, where inputs include resources such as labor, operating costs, technology, time, and effort, while outputs include revenue, profitability, service quality, transaction volume, and customer satisfaction. A higher level of output achieved with fewer inputs indicates greater operational efficiency. One of the most widely used measures is the operational efficiency ratio, which evaluates how effectively an organization utilizes its resources to generate revenue. Generally, a lower efficiency ratio indicates better performance because fewer resources are used to produce a given level of output (Alice Gomstyn & Alexandra Jonker, 2024).

In the banking sector, operational efficiency is assessed using various financial and performance indicators, including cost-to-income ratios, return on assets (ROA), transaction processing costs, service delivery speed, customer satisfaction, and asset utilization measures. Banks monitor these indicators over time and compare them with industry benchmarks to identify areas for improvement and evaluate the effectiveness of operational strategies. Therefore, measuring operational efficiency provides valuable insights into how effectively

banks control costs, utilize resources, improve service delivery, and achieve sustainable profitability, competitiveness, and overall performance.

2.4 Relationship between Digital Banking and Operational Efficiency

Digital banking has become an important driver of operational efficiency in the banking sector by enabling banks to automate routine activities, reduce operational costs, improve service delivery, and enhance overall performance. Through digital technologies, banks can streamline processes such as fund transfers, account management, bill payments, and customer service, reducing manual intervention, minimizing errors, and accelerating transaction processing. These improvements result in greater efficiency, lower costs, higher transaction volumes, and better service quality. In addition, digital platforms allow banks to collect and analyze large amounts of data, supporting informed decision-making in areas such as resource allocation, risk management, and service improvement (Berger, 2003; Luo et al., 2009; Al-Dmour, 2022).

Digital transformation also improves the integration and coordination of banking functions, enabling banks to streamline workflows, enhance communication, and increase the effectiveness of service delivery. As a result, digitalization improves not only individual banking processes but also the overall operational performance of financial institutions (Winasis, 2020; Beheshtinia, 2017). Furthermore, digital banking contributes to broader economic and institutional development by strengthening financial systems, improving transparency, enhancing investor confidence, and supporting sustainable development. The integration of finance and digital technology has led to the growth of digital finance, which continues to transform business operations, production systems, and consumer lifestyles in modern economies (Al-Dmour, 2022; Sestino, 2020; Dong et al., 2022).

2.5 Empirical Literature Review

Empirical evidence shows that digital banking has significantly transformed the banking sector by improving operational efficiency and customer convenience. Studies indicate that automation of banking processes reduces operational costs, increases service speed, and enables customers to access services 24/7 through digital platforms, thereby improving overall service delivery (Lugun, 2024). In addition, technologies such as Artificial Intelligence (AI) and blockchain enhance personalized services, support data-driven decision-

making, strengthen risk management, and promote financial inclusion, particularly for underserved populations (Adewumi, 2024).

In the Ethiopian context, existing studies mainly focus on customer-related outcomes rather than operational efficiency. For example, research by Eyasu Fekadu (2023) and Kiflu Chekole Tekle et al. (2024) found that factors such as security, transaction speed, convenience, and service availability significantly influence customer satisfaction in digital banking. Although these findings indirectly reflect improvements in service delivery, they do not directly measure how digital banking affects the operational efficiency of banks. This indicates that most Ethiopian studies have concentrated on user satisfaction rather than efficiency outcomes.

Broader banking efficiency literature shows that operational efficiency is influenced by factors such as liquidity, capital adequacy, credit risk management, asset quality, and technological adoption (Ghosh & Sanyal, 2019; Eldomiaty et al., 2015). However, existing studies in Ethiopia largely rely on ratio analysis and do not fully capture the multidimensional nature of operational efficiency. Therefore, a clear research gap exists, as limited empirical evidence directly examines the effect of digital banking services—such as mobile banking, Internet banking, ATM, POS systems, and digital payment platforms—on operational efficiency in Ethiopian commercial banks. This study addresses this gap by investigating how digital banking services influence operational efficiency in the Ethiopian banking sector.

2.6 Research Gap

Several empirical studies have examined the relationship between electronic banking and bank performance, but the results are mixed and inconclusive. Some studies, such as Leyouager (2015) and Solomon (2016), found that electronic banking has a positive effect on financial performance indicators like Return on Assets (ROA), while its impact on Return on Equity (ROE) was sometimes insignificant. Other studies, including Muta (2010), reported negative or insignificant relationships. These inconsistent findings suggest that the effect of electronic banking on bank performance varies depending on context, methodology, and measurement approaches.

The relationship between digital banking and operational efficiency is generally expected to be positive, as digital banking improves efficiency by reducing costs, increasing transaction speed, and automating banking processes. However, most existing studies have focused on financial performance measures (such as ROA and ROE) rather than directly examining

operational efficiency. This creates a conceptual gap, because operational efficiency reflects how well banks utilize resources, processes, and technology—not just profitability outcomes. Therefore, the direct link between digital banking services and operational efficiency remains under explored.

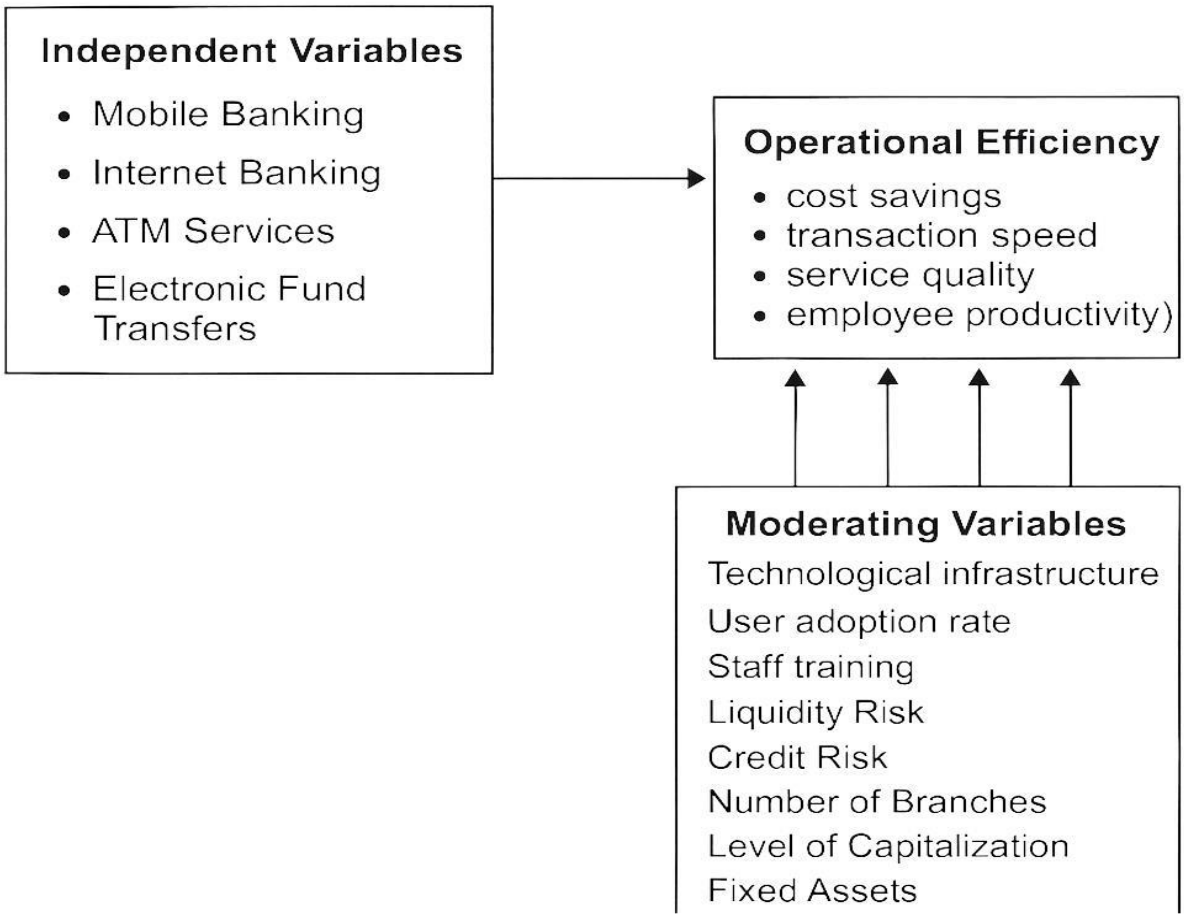
In the Ethiopian context, empirical evidence is still limited and outdated, as many studies were conducted during the early stages of digital banking adoption when usage levels were low. Existing research has also focused on a limited number of banks and mainly used financial performance indicators without fully capturing operational efficiency or the multidimensional nature of digital banking (mobile banking, Internet banking, ATM, POS, and digital payment systems). As a result, there is a clear research gap in recent and comprehensive studies that directly examine how digital banking influences operational efficiency in Ethiopian commercial banks. This study addresses this gap by analyzing the effect of digital banking services on operational efficiency using recent data and a broader efficiency framework.

2.7 Conceptual Framework

In this study, the conceptual framework illustrates the relationship between digital banking services (independent variables) and operational efficiency of commercial banks (dependent variable). Digital banking services may include components such as mobile banking, Internet banking, automated teller machines, point-of-sale systems. These digital banking tools are expected to influence operational efficiency through improvements in cost reduction, transaction speed, service quality, and resource utilization.

The conceptual framework also recognizes that the relationship between digital banking and operational efficiency may be influenced by intervening or moderating factors such as technological infrastructure, customer digital literacy, cybersecurity risks, and regulatory environment. The following diagram presents the conceptual framework of this study, showing the hypothesized relationships among the variables under investigation.

Figure 1: Conceptual framework of the study



Source: Researcher's own conceptualization, 2025

CHAPTER THREE

3 METHODOLOGY OF STUDY

3.1 Study Design

Usually, research studies are grouped into three categories based on their purpose or research objectives: exploratory, descriptive, and explanatory research Robert K. Yin. Although these classifications exist, a single study my incorporate more than one research purpose Earl Babbie. Based on the research problems, questions, and objectives, this study mainly employs a descriptive research design. Descriptive research is used to obtain information about the current status of a phenomenon and to describe "what exists" with respect to variables or conditions in a given situation. However, one limitation of descriptive research is that it does not adequately establish casual relationships among variables.To address this limitation; the study also incorporates explanatory research. Explanatory research helps identify and explain the relationship between independent and dependent variables. It is particularly useful when there is limited understanding regarding the appropriate models to apply, the magnitude of relationships, and the interaction among variables.

3.2 Population and Sample Size

The target population of this study consisted of employees and managers from different commercial banks in Ethiopia, as well as selected existing customers of these banks. Existing customers were included in the study because they had experience with banking services both before and after the implementation of different banking software systems and technological products. The study covered five different Commercial banks in Ethiopia, and a total of one hundred ten (110) questionnaires were distributed. The questionnaires were administered online through Telegram and Email to all respondents.

3.3 Sampling Method

The sampling technique that was used for the managers, employees and existing customers of CBE's is Purposive Sampling Technique. Because instead of using random sampling technique purposive sampling is better in collecting information in such area of studies. The reason behind is to get currently existing detail information regarding electronic banking services that are offered by Commercial Banks in Ethiopia.

Since the questionnaire was developed in English and the information needed requires knowledge of previous service delivery by the banks, purposive sampling technique was used for the selection of existing customers of the bank. We usually would have one or more specific predefined groups we are seeking. Purposive sampling can be very useful for situations where you need to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. With a purposive sample, you are likely to get the opinions of your target population.

3.4 Source and Methods of Data Collection

To accomplish the stated objectives, the researcher used both primary and secondary data. Primary data were collected using a structured questionnaire containing both closed-ended and open-ended questions. The questionnaire was designed to obtain information on the level of customer satisfaction, the challenges associated with the use of digital banking products by commercial banks in Ethiopia, and the economic costs incurred by banks due to frequent telecommunication and power interruptions. In addition, secondary data were collected from various sources, including books, journals, annual reports, other published materials, and the official websites of commercial banks in Ethiopia and the National Bank of Ethiopia.

3.5 Methods of Data Analysis

The study employed a descriptive research design to examine the impact of digitalization on the operational efficiency of commercial banks in Ethiopia. The study utilized six years of secondary data covering the period from 2018 to 2024, during which many commercial banks introduced Internet banking services and implemented various digitalization initiatives. The collected data were analyzed using descriptive statistical techniques such as frequency counts and percentages. The analysis was conducted with the assistance of IBM SOSS Statistics Version 21 software to process and interpret the data.

3.6 Ethical considerations

Prior to data collection, participants were asked for their willingness to take part in the study and were provided with the questionnaire only after their consent was obtained. The researcher clearly informed all respondents that the study was conducted solely for academic

purposes. Respondents were assured that their participation was voluntary and that the information they provided would be treated with strict confidentiality. To protect their privacy, the names and identities of customers and employees of the selected commercial banks were not disclosed in the research report. Furthermore, all sources of information and materials used in the study were properly acknowledged and cited in accordance with academic and ethical research standards.

CHAPTER FOUR
4 ANALYSES, DISCUSSION AND PRESENTATION OF RESULT

4.1 INTRODUCTION

This chapter presents the results of the data collected, as indicated by the research questions. This chapter is organized around the research questions in chapter one. And it presents a brief analysis of the data, results of the survey instrument along with a discussion of each research question. The objectives of the study were used by the researcher as a guide in analyzing the findings obtained from the field work. With the research objectives, the findings of the study were categorized into the following:

- ✓ Demographic Characteristics,
- ✓ Impact of digital based products on Process Efficiency,
- ✓ Challenges in using digital product of Commercial banks in Ethiopia
- ✓ Service quality and customer satisfaction
- ✓ Analysis regarding the effects of frequent interruption of power and telecommunication service on Commercial banks in Ethiopia, and

Tables and charts were utilized by the researcher to assist in interpreting the findings.

4.2 Response Rate

A total of one hundred ten (110) questionnaires were distributed online during the survey period. Out of these, fifty-three (53) questionnaires were returned and all were considered valid because they were fully completed, resulting in a response rate of 48%. Among the respondents, 43.40% were staff members of commercial banks in Ethiopia, while the remaining 56.60% were customers of commercial banks in Ethiopia.

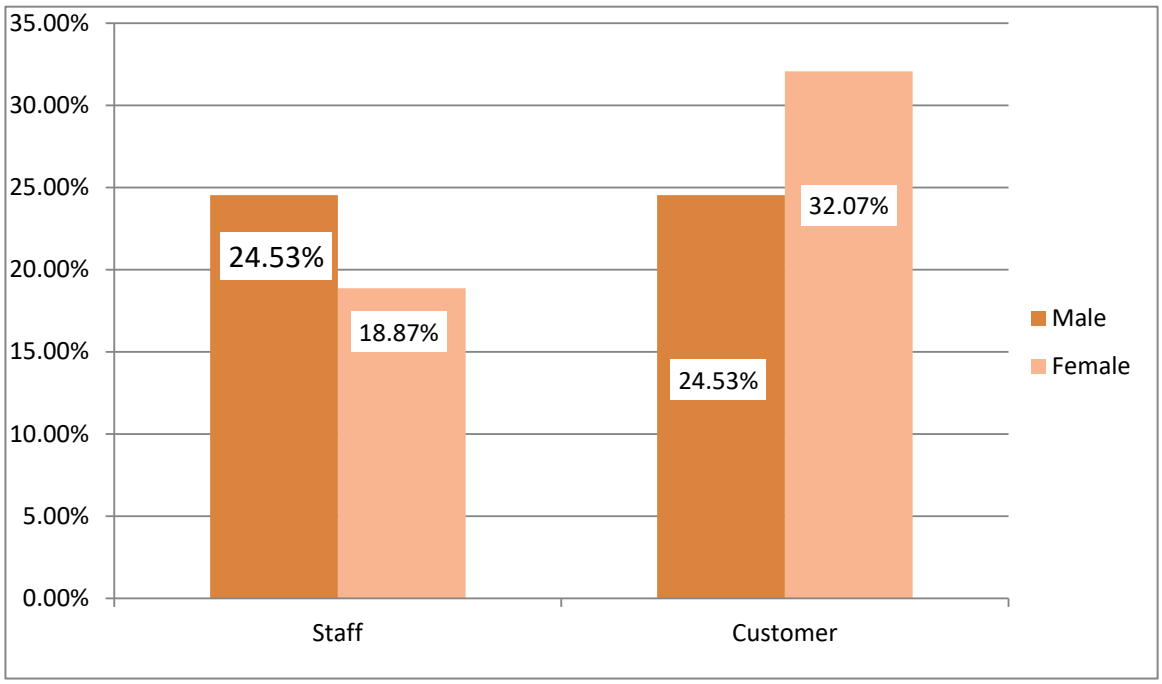
4.3 Socio-Demographic Characteristics of Respondents

Socio-demographic data were collected to identify certain personal characteristics of the respondents that could be useful in understanding their satisfaction with the bank's digital innovations. The information gathered included respondents' gender, age distribution, education level, and income level.

4.3.1 Gender of Respondents

As the graph below shows from the total female respondents 18.87% were staffs of Commercial Banks in Ethiopia and 32.07% were customers of the banks. And from the total male respondents 24.53% & 24.53% were staffs and customers of commercial banks respectively. The higher proportion of customers, particularly female customers, suggests that the findings on digital banking's impact on operational efficiency are strongly supported by customer experiences regarding service accessibility, transaction speed, convenience, and satisfaction. Since customers are the primary users of digital banking platforms, their responses help evaluate whether digital banking reduces waiting times, improves service quality, and enhances banking convenience.

Figure 2*: Gender of Respondents.*



Source: Own Survey, 2025

4.3.2 Age of Respondents

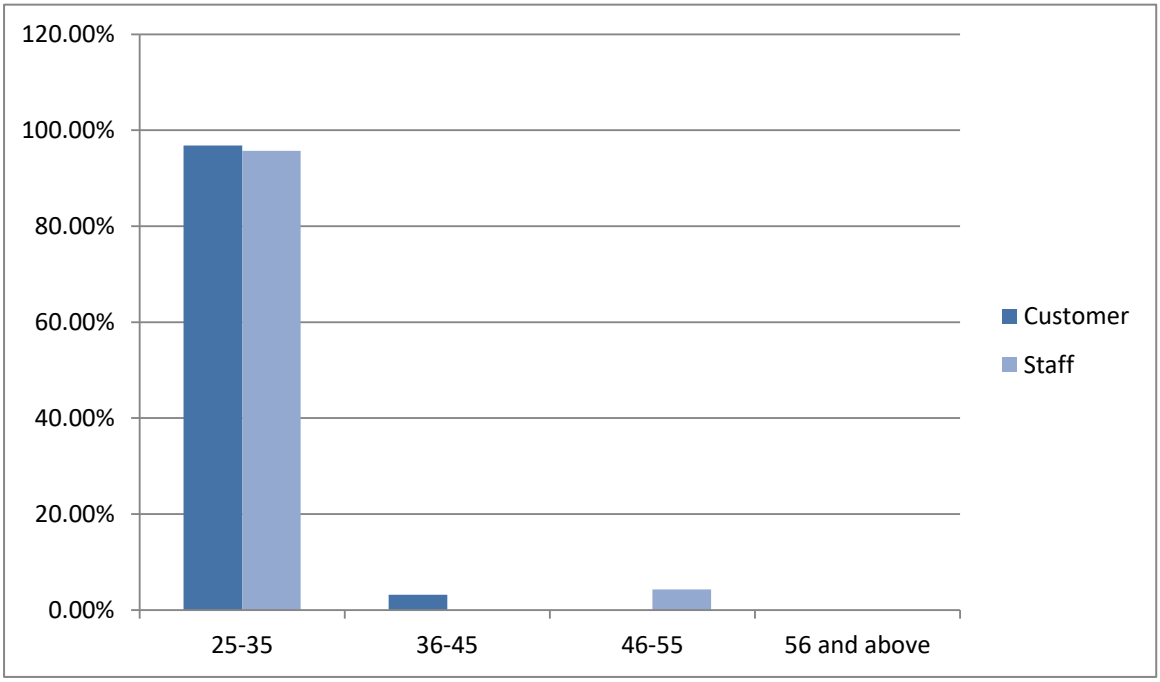
Based on the graph below the age distribution of respondents indicates that the majority of both customers (96.8%) and bank staff (95.7%) were within the age range of 25–35 years. Only a small proportion of customers (3.2%) fell within the 36–45 years age group, while 4.3% of staff respondents were between 46–55 years.

This finding is important in understanding the effect of digital banking on operational efficiency. Individuals within the 25–35 years age group are generally more familiar with digital technologies and are more likely to adopt and effectively use digital banking services such as mobile banking, Internet banking, ATM services, and POS systems. Their familiarity with technology may contribute to faster transaction processing, reduced service delivery time, and improved utilization of banking resources.

For bank employees, the dominance of younger staff suggests a workforce that is more adaptable to digital platforms and technological innovations. This can enhance employee productivity, reduce operational errors, and improve service quality, thereby contributing positively to operational efficiency. Similarly, younger customers are more likely to utilize self-service digital banking channels, which reduce congestion in banking halls and lowers operational costs for banks.

Therefore, the predominance of respondents in the economically active and technologically literate age group supports the argument that digital banking services can significantly improve the operational efficiency of commercial banks through increased adoption, faster service delivery, and better resource utilization. However, the limited representation of older age groups suggests that the findings may primarily reflect the perceptions and experiences of younger users who are more receptive to digital banking technologies.

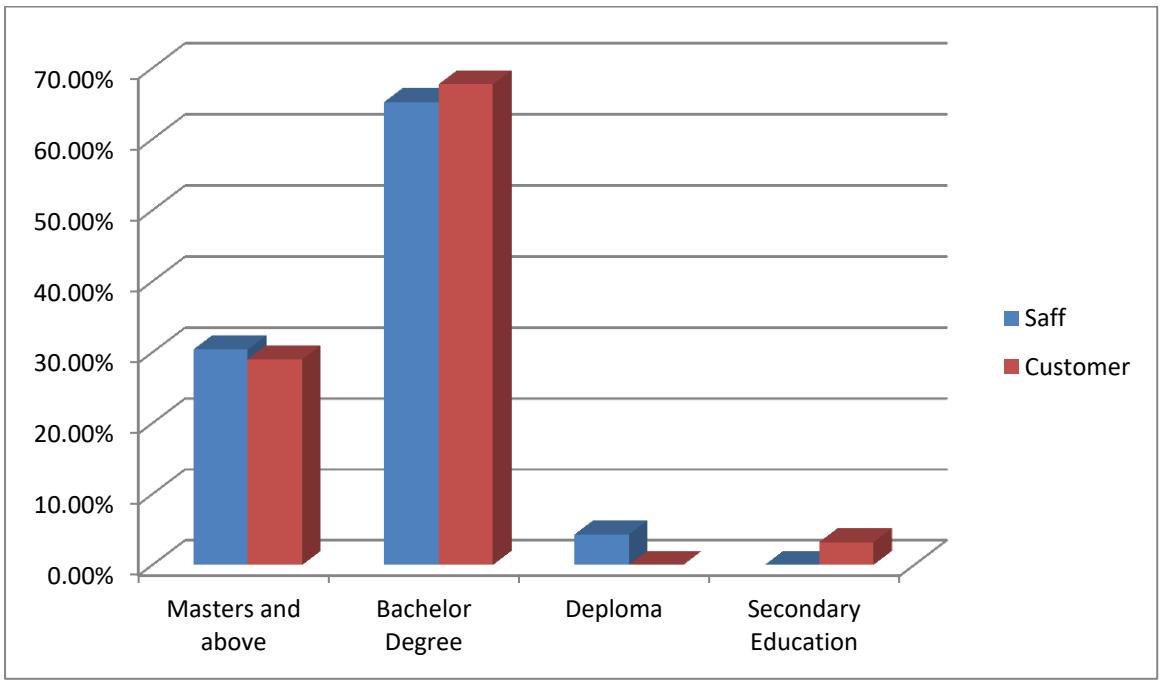
Figure 3: Age of Respondents



Source: Own Survey, 2025

4.3.3 Educational Level of Respondents

Figure 4: Educational level of respondents



Source: Own Survey, 2025

The educational background of the respondents indicates that the majority of both staff (65.2%) and customers (67.7%) held bachelor's degrees, followed by master's degree holders, who accounted for 30.4% of staff and 29.0% of customers. A small proportion of staff respondents (4.3%) possessed diploma qualifications, while 3.2% of customers had completed secondary education. These findings show that most respondents had relatively high levels of educational attainment.

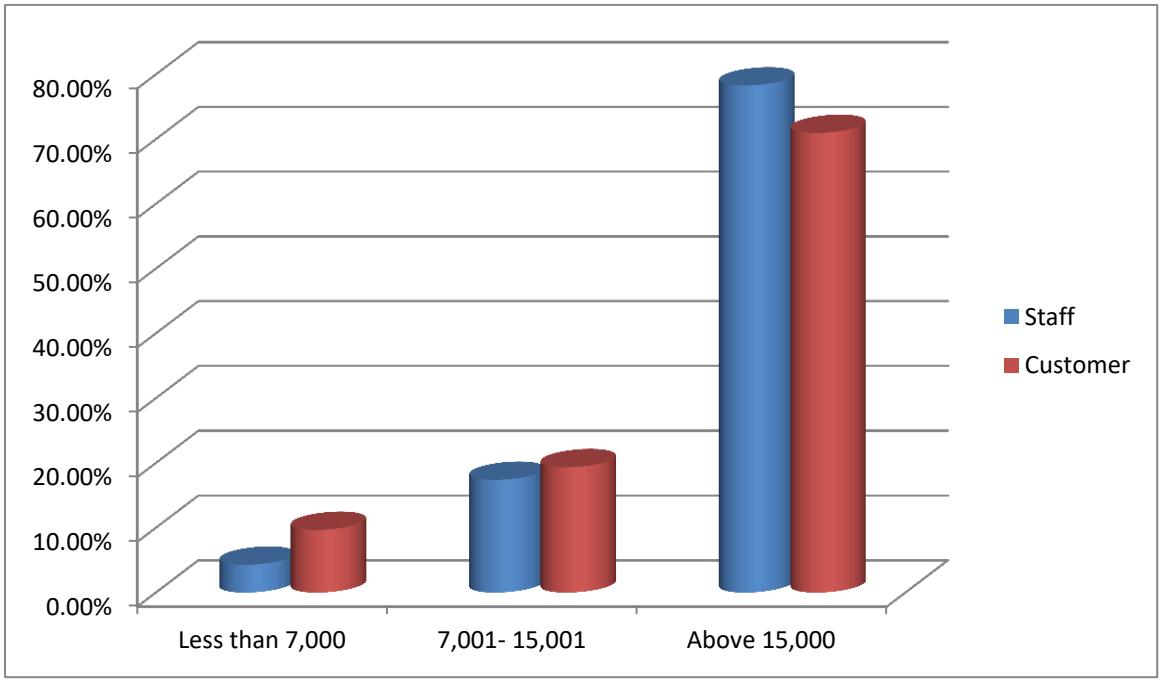
The high educational status of both staff and customers suggests a strong capacity for adopting and utilizing digital banking services. Higher educational attainment is generally associated with better technological awareness and digital literacy, which facilitate the effective use of digital banking platforms. For employees, this may enhance productivity and service delivery, while for customers, it encourages greater use of self-service banking channels. As a result, the widespread adoption of digital banking services can contribute to improved operational efficiency through faster transactions, better resource utilization, reduced operational burdens, and enhanced customer satisfaction.

4.3.4 Income Level of Respondents

The income distribution of respondents shows that the majority of both staff (78.3%) and customers (70.97%) earn more than ETB 15,001 per month. Respondents earning between ETB 7,001 and ETB 15,000 account for 17.4% of staff and 19.35% of customers, while those earning less than ETB 7,000 represent only 4.3% of staff and 9.68% of customers. This indicates that most respondents belong to relatively higher-income groups.

The predominance of higher-income respondents suggests a greater likelihood of adopting and using digital banking services, as they are more likely to have access to smartphones, internet services, and digital technologies. Increased utilization of digital banking channels can improve operational efficiency by reducing branch congestion, lowering transaction costs, minimizing processing time, and enhancing service delivery. Therefore, the income profile of the respondents supports the view that digital banking services contribute positively to the operational efficiency of commercial banks.

Figure 5: Income level of respondents



Source: Own Survey, 2025

4.4 Impact of Digital Products on Customer Satisfaction

The findings on the usage of digital banking services reveal varying levels of adoption among customers and staff. Mobile Banking (MB) was the most widely used digital banking service, with 93.5% of customers and 86.99% of staff reporting its use. This was followed by ATM services, which were used by 61.3% of customers and 78.39% of staff. SMS Alert services were utilized by 19.4% of customers and 43.5% of staff, while Internet Banking (IB) was used by 22.6% of customers and 39.10% of staff. In contrast, Branch Network services were the least utilized, with only 6.5% of customers and 34.8% of staff relying on traditional branch banking services.

The findings indicate a significant shift toward digital banking channels, particularly mobile banking and ATM services, among both customers and staff. Mobile banking emerged as the most widely used digital banking service, highlighting its importance in facilitating convenient and accessible banking transactions. The high adoption of mobile banking reduces customers' reliance on physical branch visits, thereby decreasing congestion in banking halls, shortening transaction processing times, and lowering operational costs. Similarly, the extensive use of ATM services provides customers with efficient self-service options, reducing employee workload and improving service delivery.

Although Internet Banking and SMS Alert services are used less frequently than mobile banking and ATM's, they still contribute positively to operational efficiency by enabling online transactions, enhancing communication, and reducing the need for direct staff involvement in routine banking activities. Furthermore, the low reliance on branch network services among customers reflects an increasing preference for digital banking channels. Overall, the findings suggest that the growing adoption of digital banking services has improved operational efficiency in commercial banks through enhanced service accessibility, faster transaction processing, better resource utilization, and increased customer satisfaction.

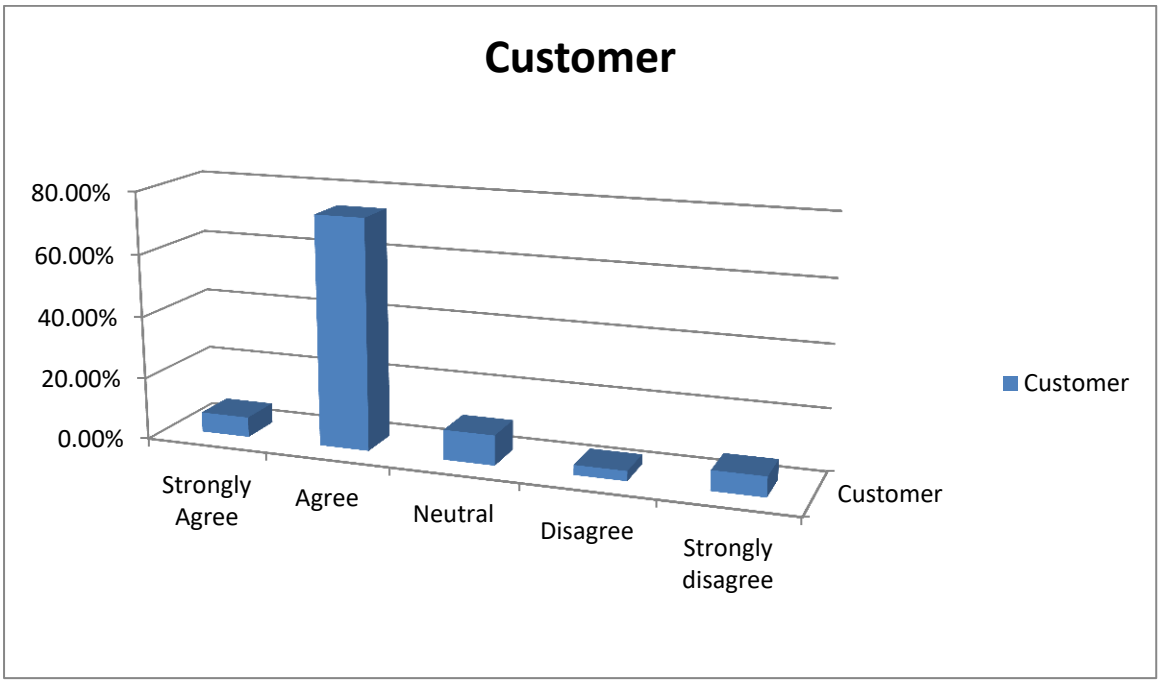
Table 1: Impacts of digital products on customer satisfaction

Response	Branch Network	ATM	SMS ALERT	MOBILE BANKING	INTERNET BANKING
Frequency	10	37	16	48	16
Percentage	18.87	69.81	30.19	90.57	30.19

Source: Own Survey, 2025

4.4.1 Branch Network

Figure 6: Using Branch network saves time and cost

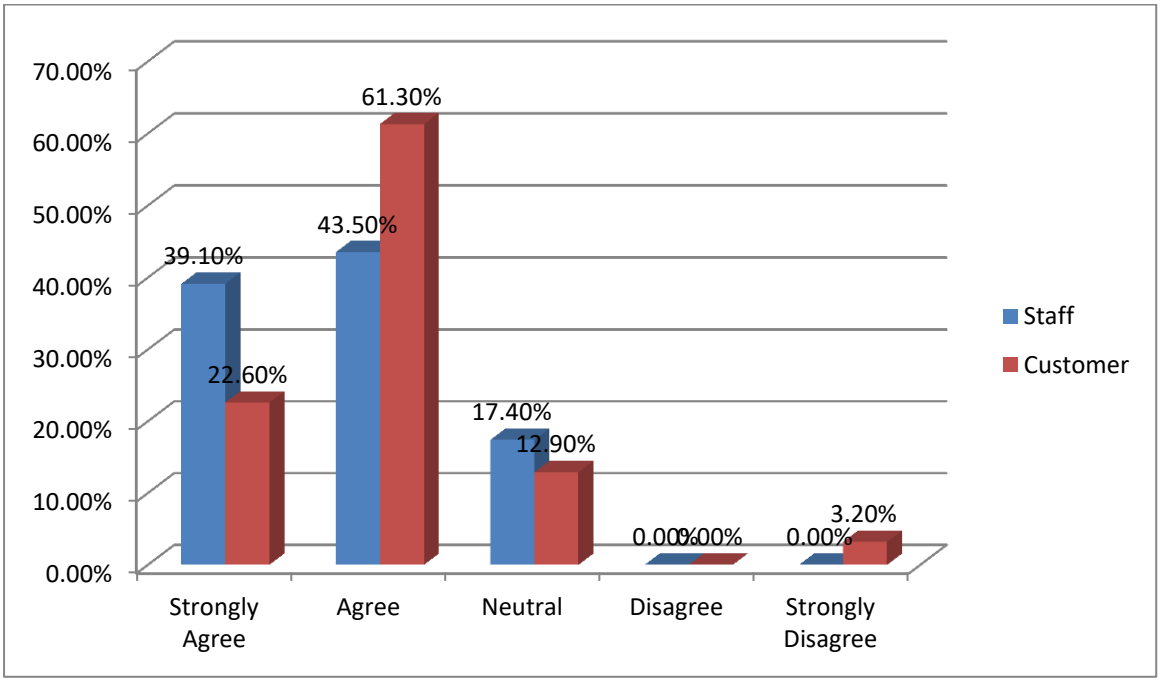


Source: Own Survey, 2025

This question was directed to customers of commercial banks in Ethiopia. Some individuals and organizations may prefer to use branch networks rather than digital banking services such as ATM's, mobile banking, internet banking, and Point of Sale (POS) terminals offered by commercial banks in Ethiopia. The reasons for this preference are discussed in Section 4.5 under “Challenges in Using Digital Banking Products.” As illustrated in the chart above, 74.2%(6.5%, strongly agree and 74.2%, agree) of the respondent customers believed that using branch networks saves more time and cost compared to digital banking products. In contrast, only 9.7% (3.2%, disagree and 6.5%, strongly disagree) of the respondents disagreed, arguing that branch banking is more costly and time-consuming than digital banking services. These respondents believed that the expenses associated with digital banking services, such as Internet costs, are relatively lower than transportation expenses and the time spent waiting for services at bank branches.

4.4.2 SMS Alert

Figure 7: Instant Notification of Debit or Credit in My Account



Source: Own Survey, 2025

The findings indicate that a large majority of both customers and staff agree that digital banking services provide instant notifications of debit and credit transactions. Among customers, 22.6% strongly agreed and 61.3% agreed, resulting in a combined agreement rate of 83.9%. Similarly, among staff respondents, 39.1% strongly agreed and 43.5% agreed,

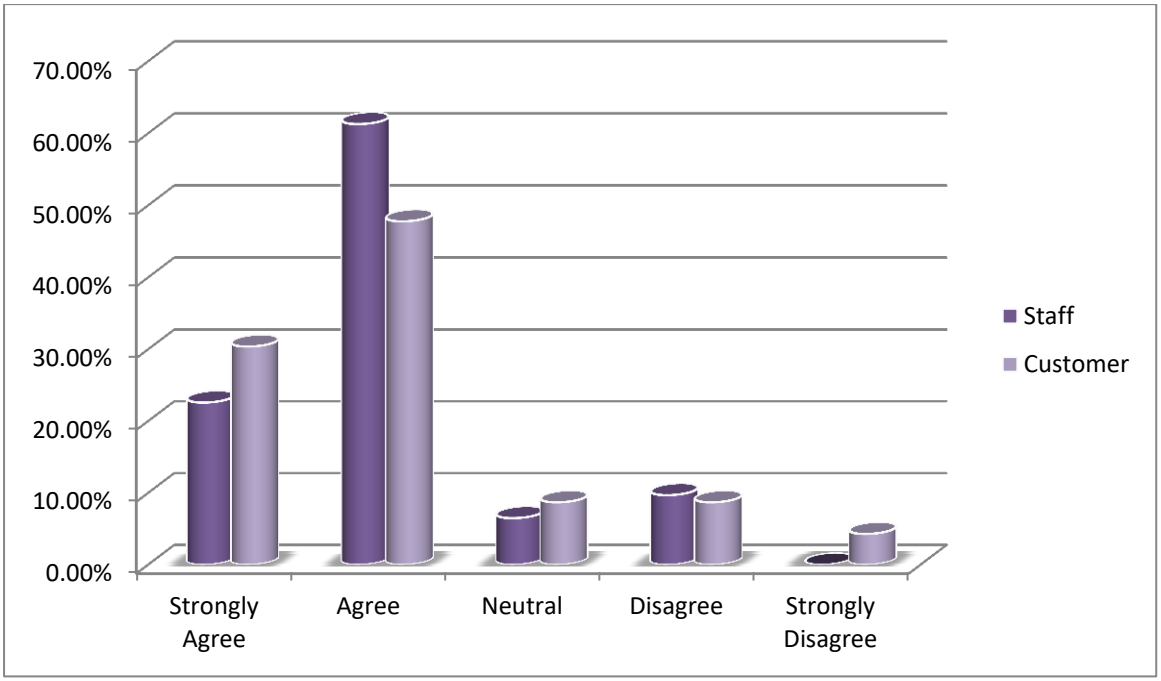
giving a total agreement rate of 82.6%. Only a small proportion of respondents remained neutral, while very few customers (3.2%) strongly disagreed and no staff respondents expressed disagreement.

These results suggest that instant transaction notification is one of the key benefits of digital banking services. Real-time alerts enable customers to monitor their accounts continuously, verify transactions immediately, and quickly detect unauthorized activities. This enhances transparency, security, and customer confidence in digital banking services. For banks, automated notification systems reduce the need for customers to visit branches or contact customer service for account information, thereby decreasing operational workload and improving service efficiency.

The high level of agreement among both customers and staff indicates that digital banking services contribute positively to operational efficiency by facilitating timely information sharing and reducing transaction-related inquiries. Instant notifications improve communication between banks and customers, enhance transaction monitoring, and support faster decision-making. As a result, banks can provide more efficient services while optimizing the use of human and technological resources. Therefore, the findings demonstrate that digital banking services, through real-time transaction notifications, play an important role in improving the operational efficiency of commercial banks.

4.4.3 Access to Account Details through SMS

Figure 8: Access to account details through SMS



Source: Own Survey, 2025

The findings show that the majority of both customers and staff agree that digital banking provides convenient access to account details through SMS services. Among customers, 22.6% strongly agreed and 61.3% agreed, giving a combined agreement rate of 83.9%. Similarly, 30.4% of staff strongly agreed and 47.8% agreed, resulting in a total agreement rate of 78.2%. Although a small proportion of respondents expressed neutral opinions or disagreement, the overall results indicate that SMS banking is widely recognized as an effective channel for accessing account information.

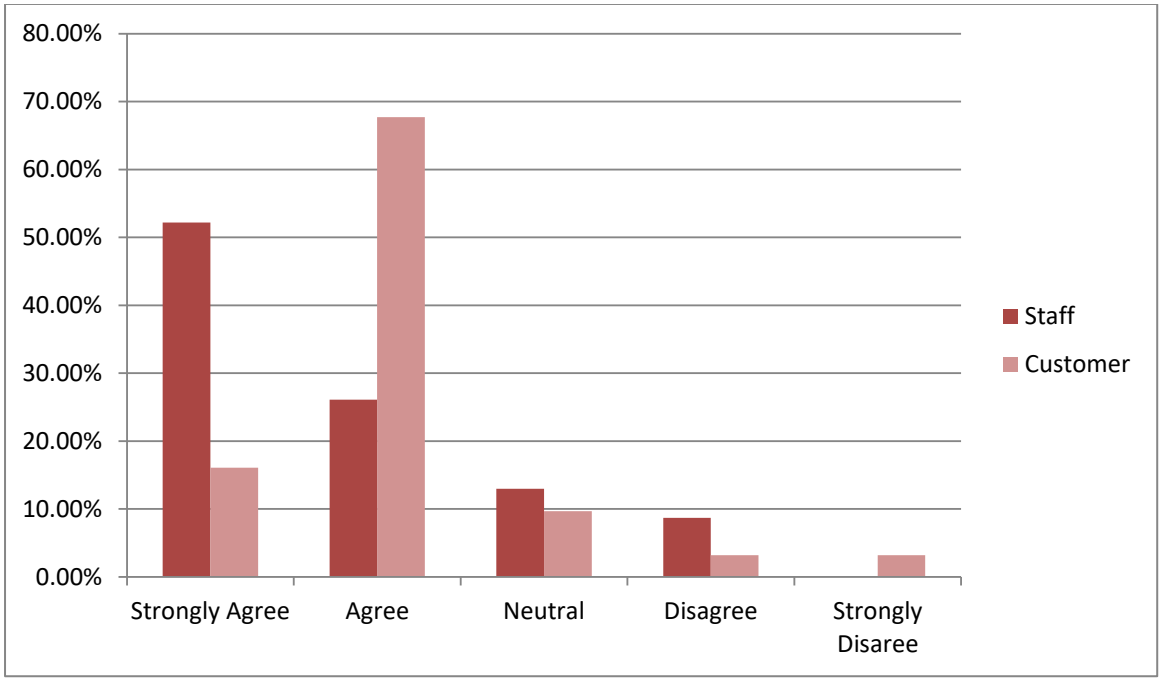
This high level of agreement suggests that SMS banking contributes positively to the operational efficiency of commercial banks. By allowing customers to obtain account details instantly without visiting a branch or contacting customer service, SMS services reduce staff workload, minimize customer waiting time, and improve service accessibility. Consequently, banks can serve customers more efficiently, optimize resource utilization, and enhance service delivery, thereby improving overall operational efficiency.

4.4.4 ATM Reduces Long Queues at Branch Halls

The findings reveal that the majority of both customers and staff agree that ATM services reduce long queues at branch halls. Among customers, 16.1% strongly agreed and 67.7% agreed, resulting in a combined agreement rate of 83.8%. Similarly, 52.2% of staff strongly agreed and 26.1% agreed, giving a total agreement rate of 78.3%. Only a small proportion of respondents expressed neutral views or disagreement. This indicates a strong perception that ATM services effectively reduce the number of customers requiring in-person services at bank branches.

The high level of agreement suggests that ATM services contribute significantly to the operational efficiency of commercial banks. By enabling customers to perform routine transactions such as cash withdrawals, balance inquiries, and fund transfers independently, ATMs reduce congestion in banking halls and lessen the workload of branch employees. As a result, banks can allocate their resources more effectively, improve service delivery, shorten waiting times, and increase overall operational efficiency.

Figure 9: ATM Reduces long queues at Branch halls



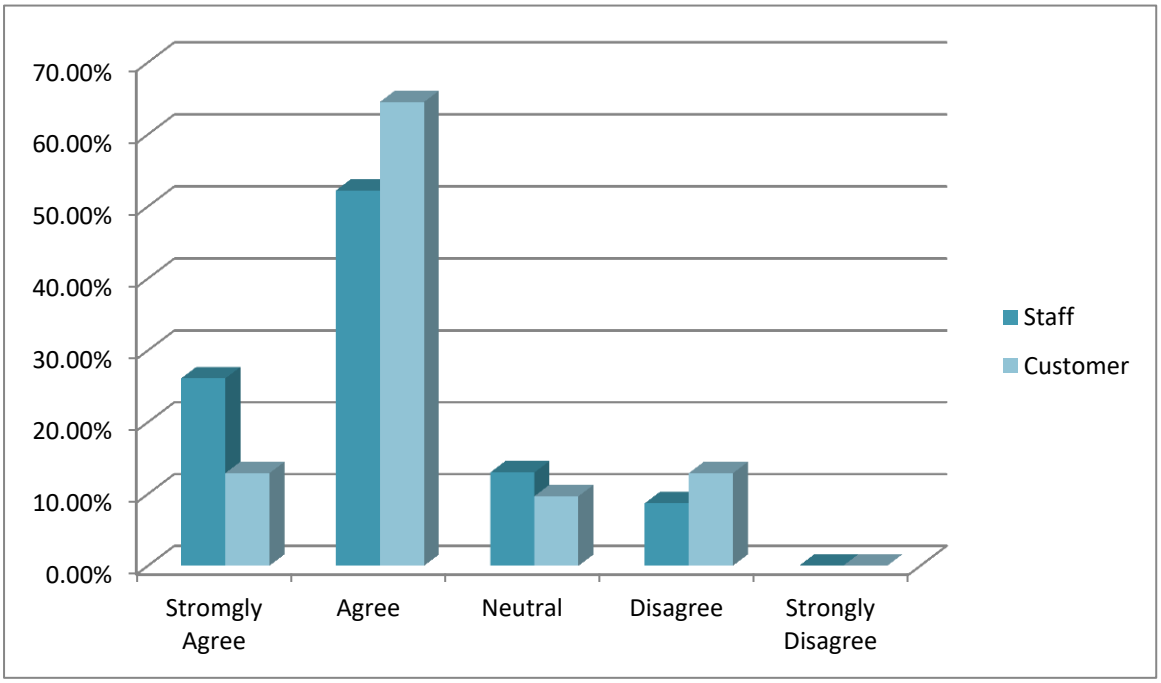
Source: Own Survey, 2025

4.4.5 ATM Gives Access at Any Location

The findings show that the majority of both customers and staff agree that ATM services provide access to banking services from any location. Among customers, 12.9% strongly agreed and 64.5% agreed, resulting in a combined agreement rate of 77.4%. Similarly, 26.1% of staff strongly agreed and 52.2% agreed, giving a total agreement rate of 78.3%. Only a small proportion of respondents expressed neutral views or disagreement. These results indicate that ATM services are widely recognized for improving the accessibility and convenience of banking services.

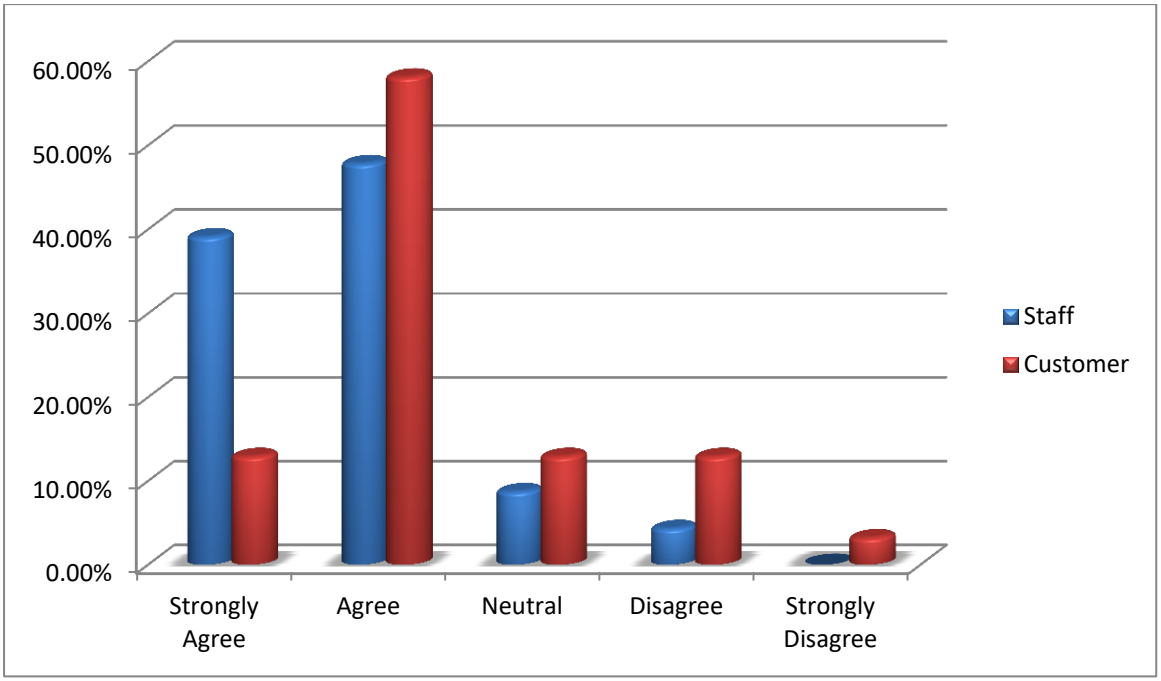
The high level of agreement suggests that ATM services contribute significantly to the operational efficiency of commercial banks. By allowing customers to access banking services from various locations without visiting a branch, ATMs reduce customer traffic in banking halls and decrease the workload of bank employees. This improves service accessibility, enhances customer convenience, and enables banks to utilize their resources more effectively. Consequently, ATM accessibility supports faster service delivery and improved operational efficiency in commercial banks.

Figure 10: ATM gives access at any location



4.4.6 ATM Enhances Access Any Time

Figure 11: ATM enhances Access Any Time

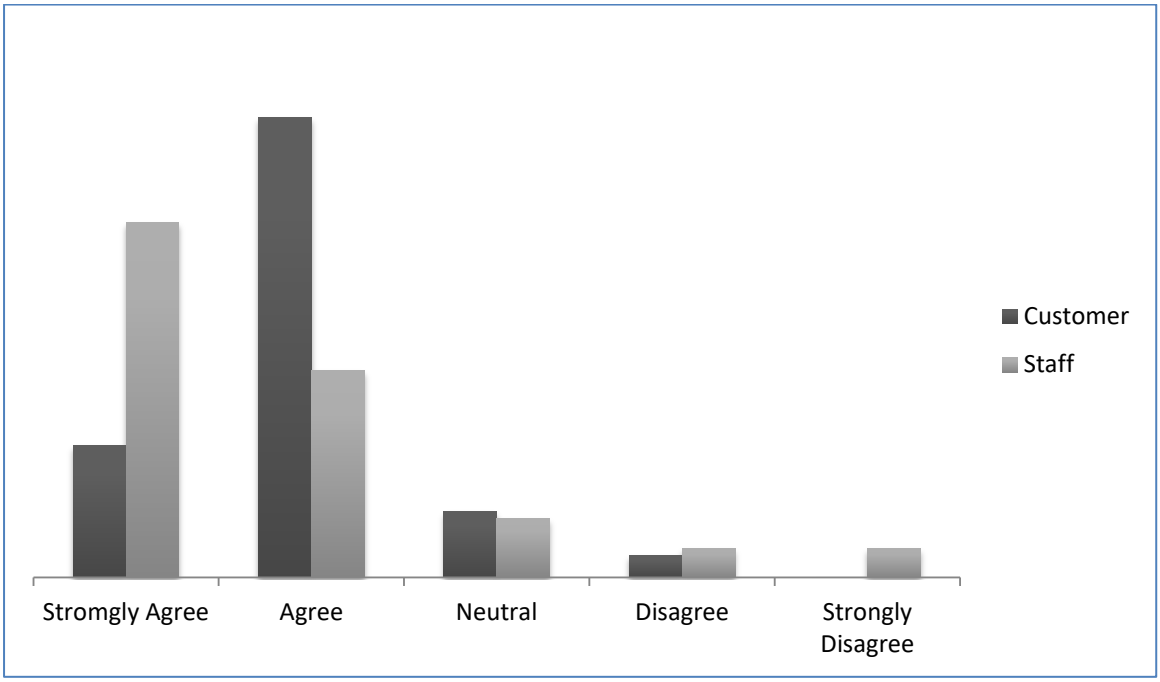


The findings indicate that a majority of both customers and staff agree that ATM services enhance access to banking services at any time. Among customers, 12.9% strongly agreed and 58.1% agreed, resulting in a combined agreement rate of 71.0%. Similarly, 39.1% of staff strongly agreed and 47.8% agreed, giving a total agreement rate of 86.9%. Although some respondents expressed neutral opinions or disagreement, the overall results demonstrate that ATM services are widely perceived as providing convenient and continuous access to banking services.

This suggests that ATM services contribute positively to the operational efficiency of commercial banks by enabling customers to conduct transactions beyond regular banking hours. Continuous access reduces dependence on branch services, minimizes congestion during working hours, and allows employees to focus on more complex banking activities. Consequently, ATM's improve service availability, enhance customer convenience, optimize resource utilization, and support greater operational efficiency within commercial banks.

4.4.7 Mobile Banking Reduces Long Queues at Branch Halls

Figure 12: Mobile Banking Services Reduce longer Queues in the branches



Source: Own Survey, 2025

The findings indicate that the majority of both customers and staff agree that mobile banking reduces long queues at branch halls. Among customers, 19.4% strongly agreed and 67.7% agreed, resulting in a combined agreement rate of 87.1%. Similarly, 52.2% of staff strongly agreed and 30.4% agreed, giving a total agreement rate of 82.6%. Only small proportions of respondents were neutral or disagreed with the statement. This strong level of agreement demonstrates that mobile banking is effective in reducing customers' dependence on physical branch visits for routine banking transactions.

The results suggest that mobile banking contributes positively to the operational efficiency of commercial banks. By enabling customers to conduct transactions remotely, mobile banking reduces congestion in banking halls, shortens waiting times, and decreases the workload of branch employees. This allows banks to allocate resources more efficiently, improve service delivery, and focus staff efforts on more complex customer needs. Consequently, the widespread use of mobile banking enhances operational efficiency through improved accessibility, faster transaction processing, and better utilization of bank resources.

4.4.8 Mobile Banking Reduces cost and time involved in Bank Transactions

This question was directed to employees of commercial banks in Ethiopia. Table 4.3.7 below indicates that a large majority of staff respondents believe that mobile banking reduces the cost and time involved in banking transactions. Specifically, 56.5% strongly agreed and 26.1% agreed, resulting in a combined agreement rate of 82.6%, while only 8.7% disagreed and 8.7% remained neutral. This high level of agreement suggests that mobile banking significantly enhances operational efficiency by enabling faster transaction processing, reducing paperwork and manual procedures, and minimizing the costs associated with branch-based services. As a result, mobile banking helps commercial banks optimize resource utilization, improve employee productivity, and deliver services more efficiently, thereby contributing positively to overall operational efficiency.

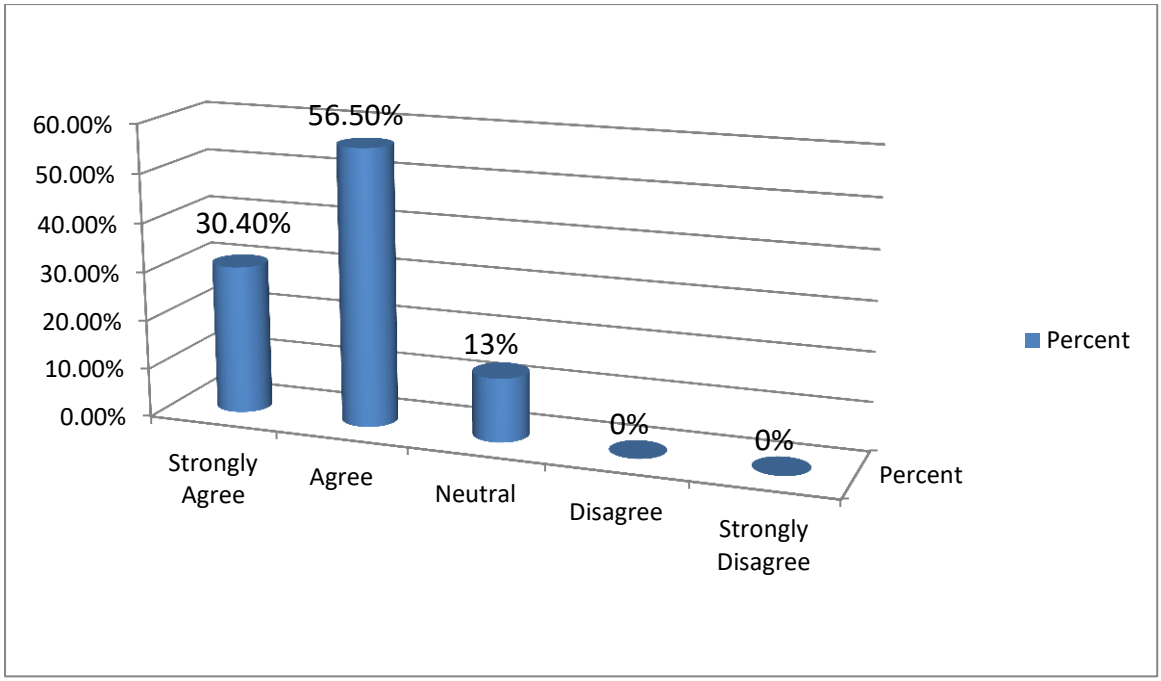
Table 2: Mobile Banking reduces costs and time involved in bank transactions

Level of agreement		Frequency	Percent
	Strongly disagree	0	0
Valid	Disagree	6	11.32
	Neutral	4	7.55
	Agree	23	43.40
	Strongly Agree	20	37.73
	Total	53	100

Source: Own Survey, 2025

4.5 Impact of Digital on Efficiency

Figure 13: Newly Adopted digital products of Commercial banks in Ethiopia are useful in productive use of resources



Source: Own Survey, 2025

This question was directed to employees of commercial banks in Ethiopia. The findings indicate that staff respondents have a highly positive perception of the usefulness of newly adopted digital banking products in promoting the productive use of resources. Specifically, 30.4% of respondents strongly agreed and 56.5% agreed, resulting in a combined agreement rate of 86.9%, while 13% remained neutral and none expressed disagreement. This strong level of agreement suggests that digital banking products enable commercial banks to utilize their human, financial, and technological resources more effectively by automating routine processes, reducing manual work, and improving service delivery. Consequently, the adoption of digital banking products contributes significantly to operational efficiency through enhanced productivity, better resource allocation, and reduced operational costs.

The findings reveal an overwhelmingly positive perception among staff regarding the role of modern banking technology in enhancing service delivery. Specifically, 43.5% of respondents strongly agreed and 52.2% agreed that modern banking technology enables quick and timely service delivery, resulting in a combined agreement rate of 95.7%, while only 4.3% disagreed. This strong level of agreement suggests that digital banking technologies significantly improve operational efficiency by accelerating transaction processing, reducing service delays, enhancing employee productivity, and enabling banks to provide faster and more reliable services to customers. Consequently, the adoption of modern banking

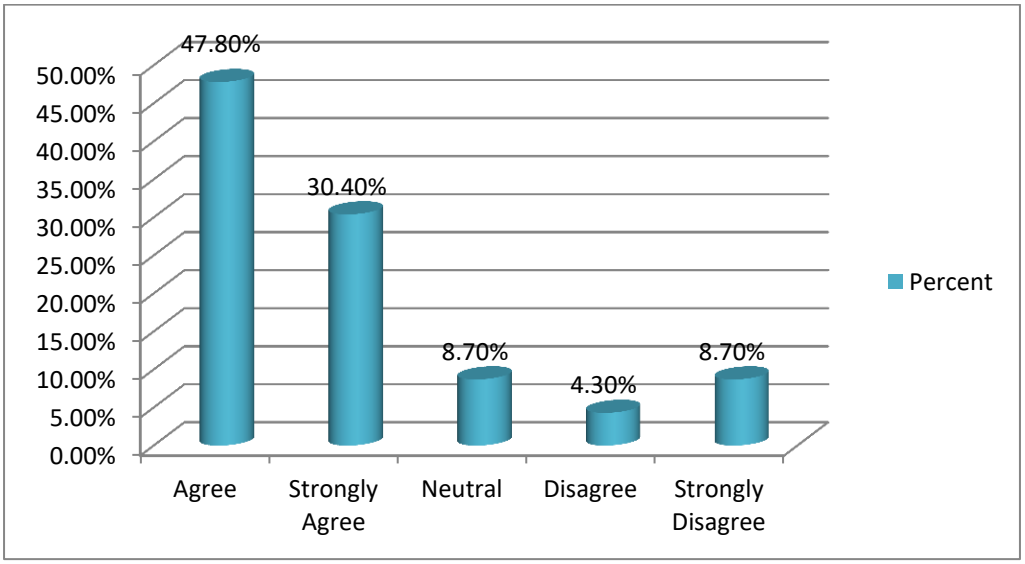
technology contributes substantially to improved operational performance and customer satisfaction.

4.5.2 Quick and timely service delivery due to the use of modern banking technology

This question was directed to employees of commercial banks in Ethiopia. The findings reveal an overwhelmingly positive perception among staff regarding the role of modern banking technology in enhancing service delivery. Specifically, 43.5% of respondents strongly agreed and 52.2% agreed that modern banking technology enables quick and timely service delivery, resulting in a combined agreement rate of 95.7%, while only 4.3% disagreed. This strong level of agreement suggests that digital banking technologies significantly improve operational efficiency by accelerating transaction processing, reducing service delays, enhancing employee productivity, and enabling banks to provide faster and more reliable services to customers. Consequently, the adoption of modern banking technology contributes substantially to improved operational performance and customer satisfaction.

4.5.3 Introduction of Digitalization Increased the Number of Transactions

Figure 14: The use of modern digital products increases number of transactions



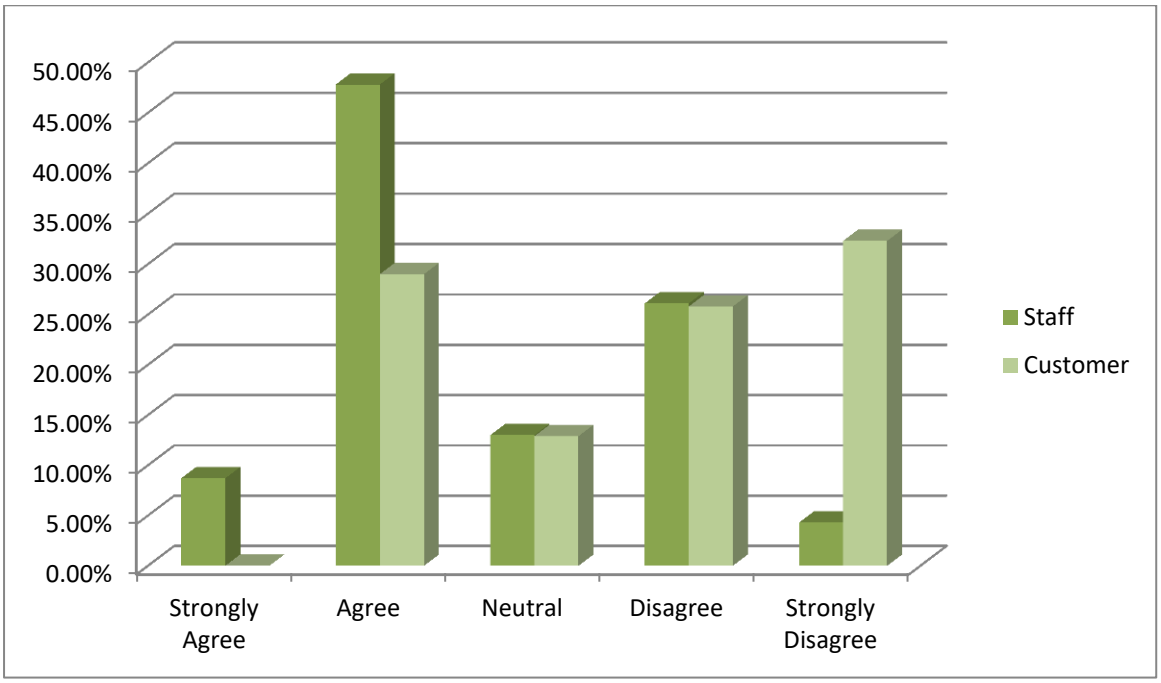
Source: Own Survey, 2025

This question was directed to employees of commercial banks in Ethiopia. The findings reveal that the majority of staff respondents believe that the use of modern digital banking products increases the number of transactions conducted by customers. Specifically, 30.4% strongly agreed and 47.8% agreed, resulting in a combined agreement rate of 78.2%, while 8.7% were neutral and 13.0% expressed disagreement. This indicates that digital banking services encourage greater transaction activity by providing customers with convenient, accessible, and time-saving banking channels. An increase in transaction volume through digital platforms enhances operational efficiency by enabling banks to process more transactions with fewer physical resources, reducing branch workload, improving service delivery, and maximizing the utilization of technological infrastructure.

4.6 Challenges in Using Digital Products of Commercial Banks in Ethiopia

4.6.1 Security Reason

Figure 15: Fear of using digital products due to security Reason



Source: Own Survey, 2025

The above chart shows that mixed perceptions regarding fear of using digital banking products due to security reasons. Among customers, 29% agreed that security concerns create fear in using digital banking services, while a larger proportion, 58.1% (25.8% disagree and 32.3% strongly disagree), rejected this view. Similarly, among staff respondents, 56.5% (8.7% strongly agree and 47.8% agree) acknowledged that security concerns can discourage

the use of digital banking products, whereas 30.4% disagreed or strongly disagreed. These results indicate that although many customers appear confident in using digital banking services, security concerns remain an important issue, particularly from the perspective of bank employees.

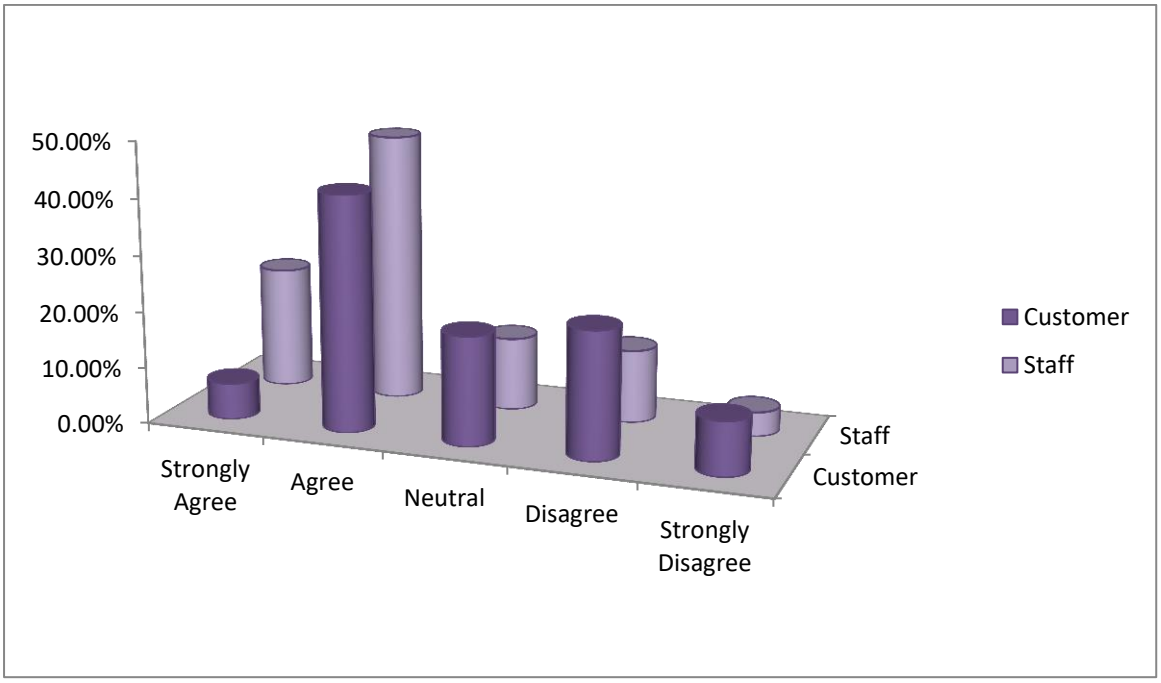
The findings suggest that security concerns can influence the adoption and utilization of digital banking services, which in turn affects operational efficiency. When customers are hesitant to use digital banking due to perceived security risks, the potential benefits of digital platforms, such as reduced branch congestion, faster transaction processing, and lower operational costs, may not be fully realized. Therefore, strengthening cybersecurity measures, enhancing customer awareness, and building trust in digital banking systems are essential for increasing adoption rates and maximizing the positive impact of digital banking on the operational efficiency of commercial banks.

4.6.2 Computer Illiteracy

The findings indicate that both staff and customers perceive computer illiteracy as a challenge to the adoption of digital banking services. Among staff respondents, 26.7% strongly agreed and 47.8% agreed, resulting in a combined agreement rate of 74.5%. Similarly, 6.5% of customers strongly agreed and 41.9% agreed, giving a total agreement rate of 48.4%. However, 32.3% of customers and 17.3% of staff disagreed or strongly disagreed with the statement. These results suggest that computer illiteracy remains a significant barrier to the effective utilization of digital banking services, particularly from the perspective of bank employees.

The presence of computer illiteracy can negatively affect the operational efficiency benefits expected from digital banking. Customers with limited digital skills may be reluctant or unable to use mobile banking, internet banking, ATM, and other digital platforms, leading to continued reliance on branch-based services. This can increase customer traffic at branches, place additional workload on employees, and reduce the efficiency gains associated with digital banking. Therefore, improving digital literacy through customer education and awareness programs is essential for increasing digital banking adoption and enhancing the operational efficiency of commercial banks.

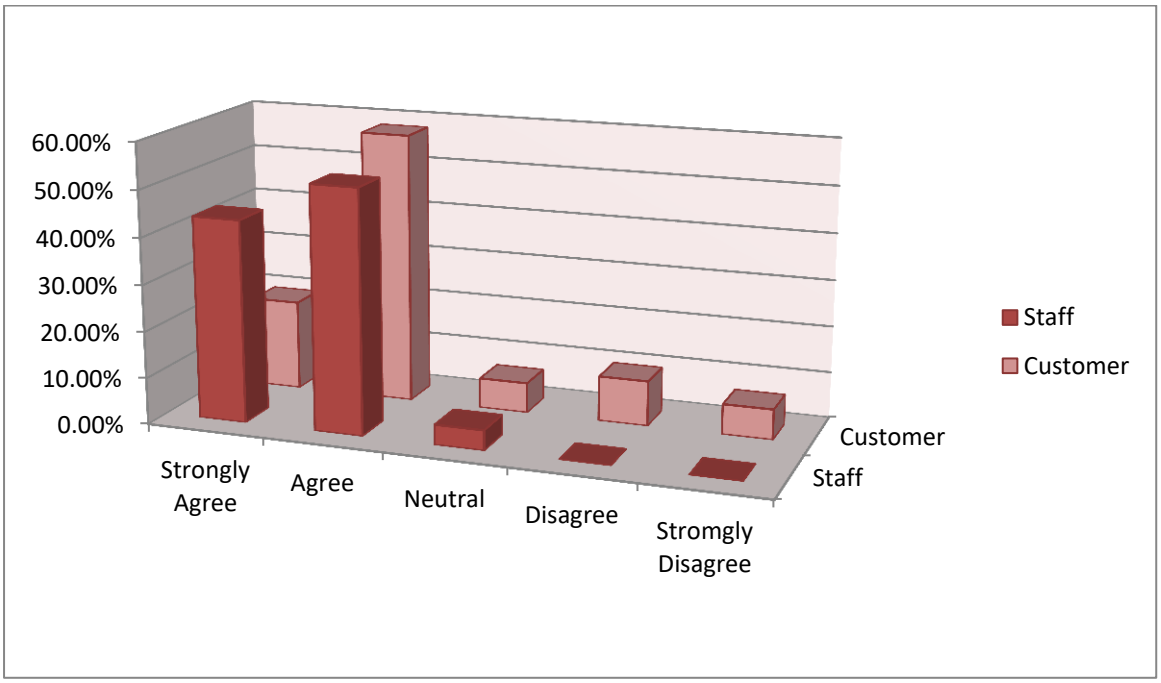
Figure 16: Computer Illiteracy is one of the challenges



Source: Own Survey, 2025

4.6.3 Poor Infrastructure

Figure 17: Poor infrastructure



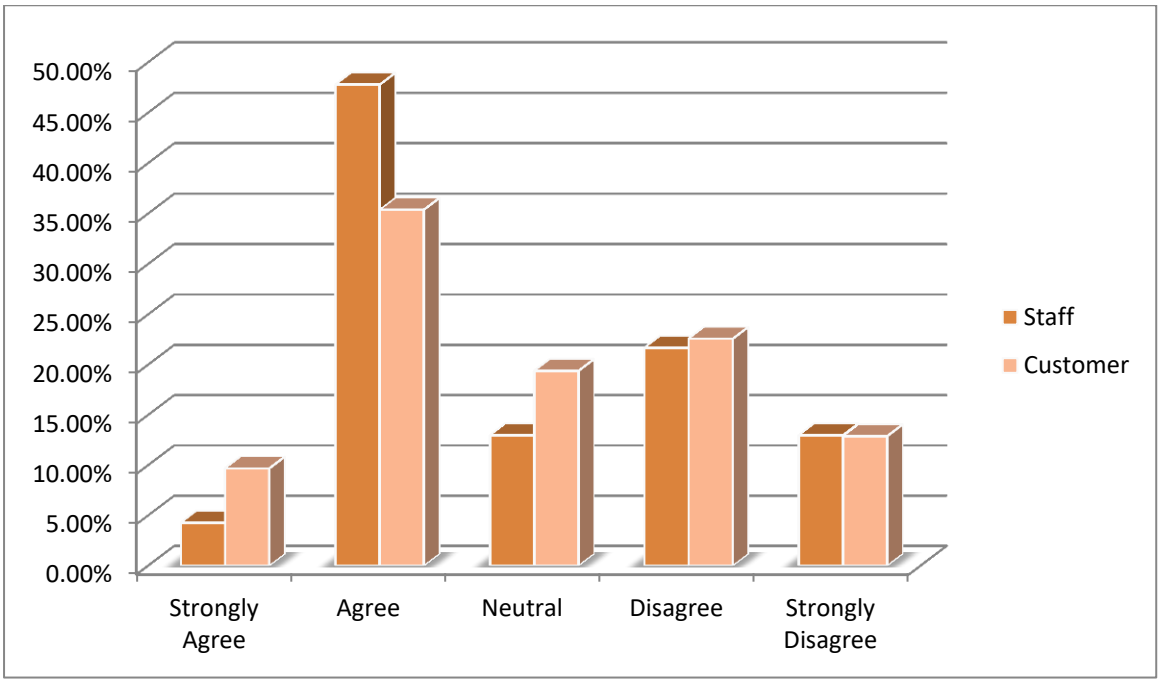
Source: Own Survey, 2025

The findings reveal that the majority of both staff and customer respondents perceive poor infrastructure as a major challenge to the adoption of digital banking services. Among staff respondents, 43.5% strongly agreed and 52.2% agreed, resulting in a combined agreement rate of 95.7%. Similarly, among customers, 19.4% strongly agreed and 58.1% agreed, giving a total agreement rate of 77.5%. Only a small proportion of respondents expressed neutral views or disagreement. This strong level of agreement indicates that infrastructure-related issues, such as unreliable internet connectivity, power interruptions, and inadequate technological facilities, remain significant obstacles to the effective implementation and use of digital banking services.

The results suggest that poor infrastructure can limit the positive effect of digital banking on operational efficiency. Frequent network failures and technological disruptions may lead to transaction delays, reduced service availability, customer dissatisfaction, and increased operational costs. As a result, banks may not fully realize the benefits of digital banking, such as faster service delivery, improved resource utilization, and reduced branch congestion. Therefore, strengthening technological and communication infrastructure is essential to enhance digital banking adoption and maximize its contribution to the operational efficiency of commercial banks.

4.6.4 Frequent Network Communication Error

Figure 18: I am facing frequent Network Communication error



Source: Own Survey, 2025

The findings show that network communication errors are a notable challenge in the use of digital banking services. Among staff respondents, 4.3% strongly agreed and 47.8% agreed that they frequently face network communication errors, resulting in a combined agreement rate of 52.1%. Similarly, 9.7% of customers strongly agreed and 35.5% agreed, giving a total agreement rate of 45.2%. However, 34.7% of staff and 35.5% of customers disagreed or strongly disagreed, while a considerable proportion remained neutral. These results indicate that although perceptions vary, a substantial number of respondents experience network-related problems when using digital banking services.

The presence of frequent network communication errors can negatively affect the operational efficiency of commercial banks. Network disruptions may lead to transaction delays, service interruptions, failed transactions, and customer dissatisfaction, reducing the effectiveness of digital banking channels. Such challenges can increase customer reliance on branch services and require additional staff intervention to resolve issues, thereby limiting the efficiency gains expected from digital banking. Therefore, improving network reliability and communication infrastructure is essential for enhancing service quality and maximizing the positive impact of digital banking on operational efficiency.

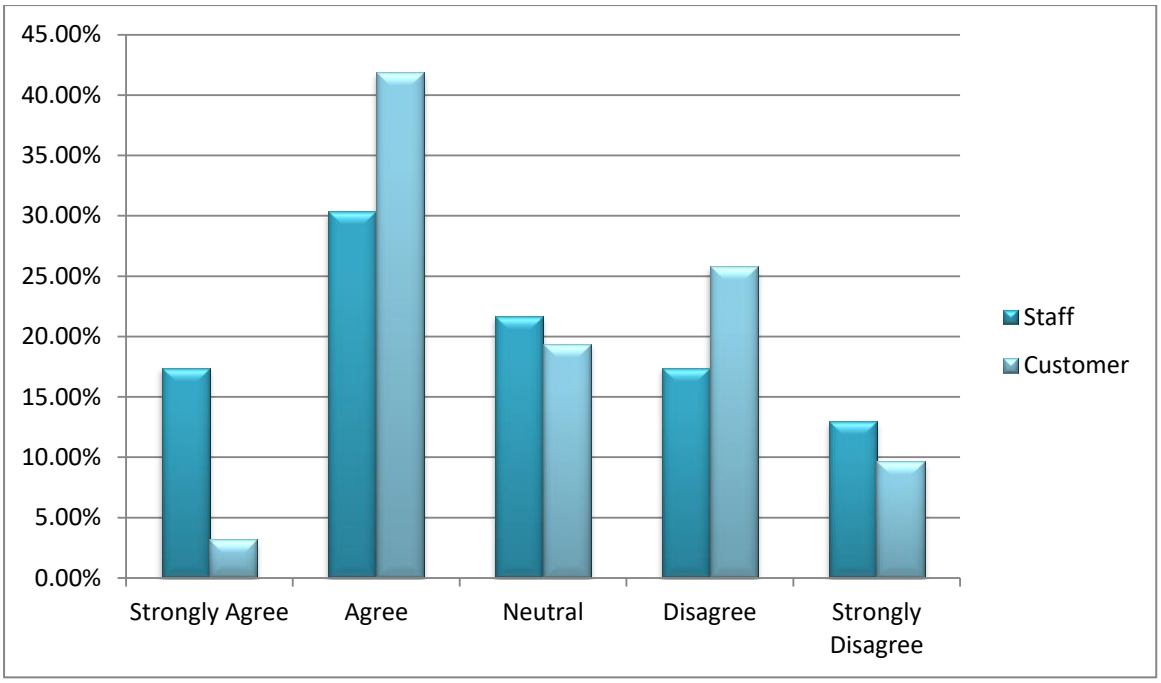
4.6.5 Frequent Power Interruption

The findings indicate that power interruptions are a challenge affecting the use of digital banking services. Among staff respondents, 17.4% strongly agreed and 30.4% agreed that they frequently face power interruptions, resulting in a combined agreement rate of 47.8%. Similarly, among customers, 3.2% strongly agreed and 41.9% agreed, giving a total agreement rate of 45.1%. Meanwhile, 30.4% of staff and 35.5% of customers disagreed or strongly disagreed, while a considerable proportion remained neutral. These results suggest that power interruptions are experienced by a significant number of respondents, although the severity of the problem may vary across locations and users.

The occurrence of frequent power interruptions can negatively affect the operational efficiency of commercial banks by disrupting digital banking platforms and delaying transaction processing. Interruptions in electricity supply may lead to system downtime, reduced service availability, failed transactions, and customer dissatisfaction. Such disruptions can force customers to rely on traditional branch services, increasing employee workload and reducing the efficiency benefits associated with digital banking. Therefore,

ensuring a reliable power supply and strengthening backup power systems are essential to support continuous digital banking operations and enhance operational efficiency.

Figure 19: I am facing frequent Power interruption



Source: Own Survey, 2025

4.6.6 ATMs are frequently Out Of Service

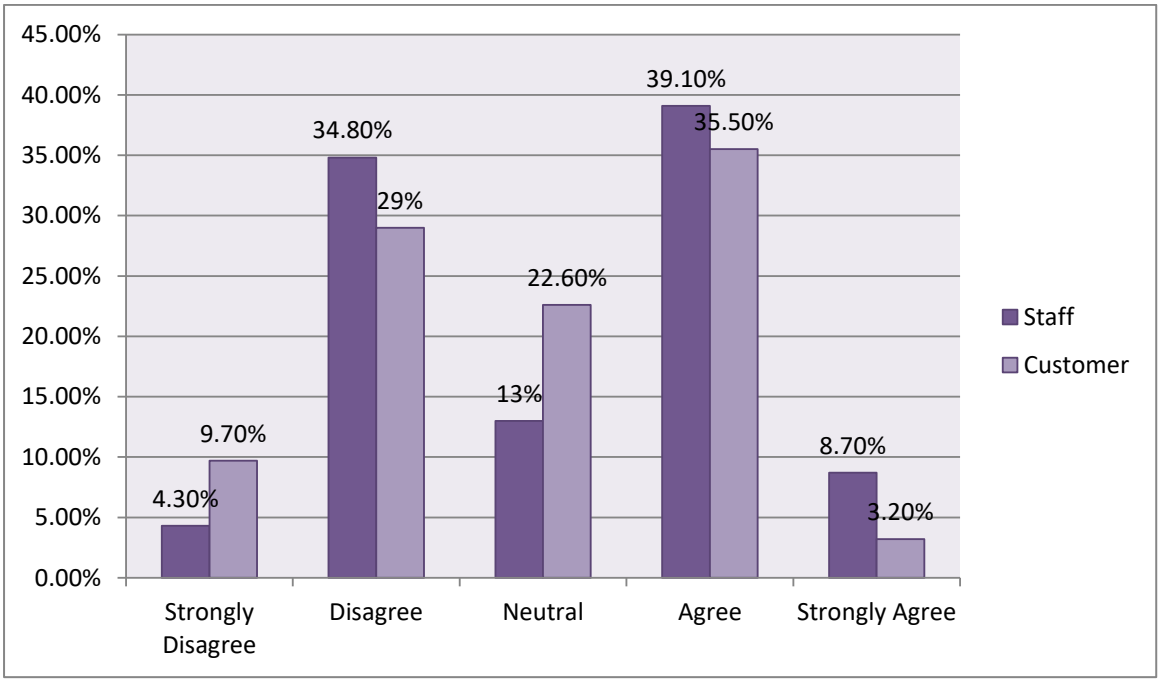
The findings indicate mixed opinions regarding whether ATMs are out of service most of the time. Among staff respondents, 8.7% strongly agreed and 39.1% agreed, resulting in a combined agreement rate of 47.8%, while 39.1% disagreed or strongly disagreed. Similarly, among customers, 3.2% strongly agreed and 35.5% agreed, giving a total agreement rate of 38.7%, whereas 38.7% disagreed or strongly disagreed. A considerable proportion of respondents also remained neutral. These results suggest that ATM service interruptions are experienced by a notable number of users, although opinions are divided regarding their frequency.

The existence of ATM downtime can negatively affect the operational efficiency of commercial banks by reducing service availability and limiting customers' access to self-service banking facilities. When ATMs are unavailable, customers may be forced to visit bank branches for routine transactions, increasing branch congestion and employee workload. This reduces the efficiency gains expected from digital banking services and may lead to

customer dissatisfaction. Therefore, improving ATM maintenance, system reliability, and cash availability is essential to ensure continuous service delivery and maximize the contribution of ATM services to operational efficiency.

The following graph indicates that there is no significant difference between staff and customers of commercial banks in Ethiopia regarding this issue. Overall, both groups of respondents, including staff members and customers of CBE, generally agree that ATMs are frequently out of service.

Figure 20: Most of the time ATMs are out of service



Source: Own Survey, 2025

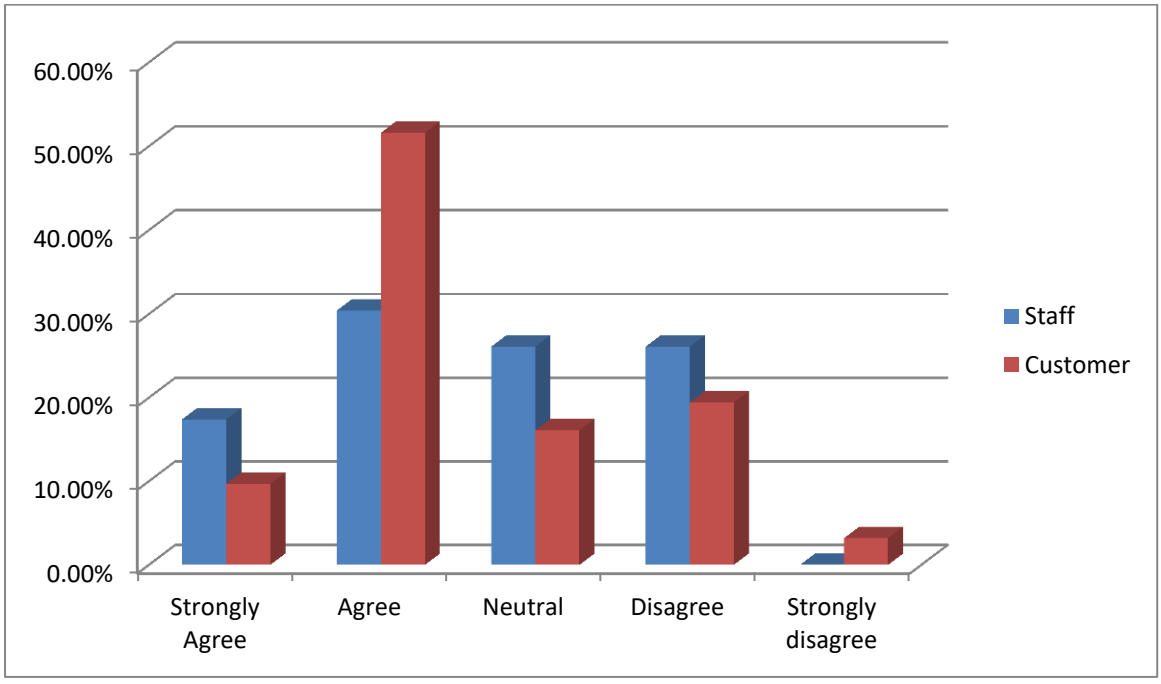
4.6.7 Shortage of Money on ATM at Peak Hour

Sometimes, ATMs may not be completely out of service, but may experience cash shortages. In such situations, the machines are still able to provide services such as fund transfers, balance inquiries, and mini statements; however, cash withdrawal services may not be available. This problem is more common during peak hours or on weekends when cash demand is high. The figure below indicates that shortages of cash in ATMs during peak hours or weekends are a common concern among both staff and customers. Among staff respondents, 17.4% strongly agreed and 30.4% agreed, resulting in a combined agreement rate of 47.8%, while 26.1% disagreed and 26.1% remained neutral. Similarly, among

customers, 9.7% strongly agreed and 51.6% agreed, giving a total agreement rate of 61.3%, whereas 22.6% disagreed or strongly disagreed. These results suggest that a substantial proportion of respondents experience cash shortages in ATMs, particularly during periods of high demand.

The occurrence of cash shortages can negatively affect the operational efficiency of commercial banks by reducing the reliability and effectiveness of ATM services. When customers are unable to access cash through ATMs, they may be forced to visit bank branches, increasing customer congestion and staff workload. This undermines the convenience and efficiency benefits expected from digital banking channels and may lead to customer dissatisfaction. Therefore, effective cash management and timely replenishment of ATMs are essential to ensure uninterrupted service availability and enhance the contribution of digital banking services to operational efficiency.

Figure 21: I am facing shortage of Money in ATMs during peak hours or weekends



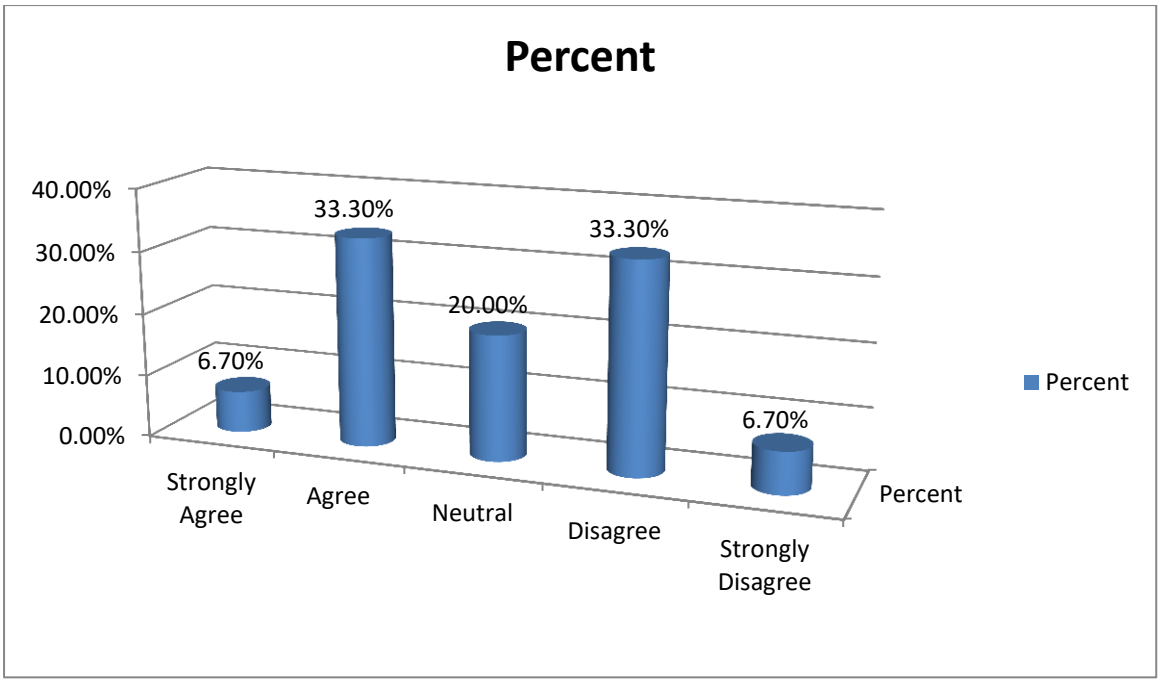
Source: Own Survey, 2025

4.6.8 Problems in accessing funds at another branch

This question was administered to customers of commercial banks in Ethiopia only. The table below presents the frequency and percentage distribution of respondents who experience or do not experience difficulties in accessing their accounts at different branches,

particularly when an account is opened in one branch but services are required from another branch of the same bank in Ethiopia.

Figure 22: Problems in Accessing Funds at another Branch



Source: Own Survey, 2025

As shown in the chart above, most customers do not experience significant problems in accessing funds from another branch. While 6.5% of respondents strongly agreed and 32.3% agreed that they faced such problems, a larger proportion, 35.5%, disagreed and 6.5% strongly disagreed, with 19.4% remaining neutral. This suggests that inter-branch banking services are generally functioning effectively for most customers. The relatively low level of difficulty in accessing funds across branches reflects the positive contribution of digital banking systems to operational efficiency by improving connectivity among branches, facilitating faster access to customer accounts, enhancing service accessibility, and reducing delays in transaction processing.

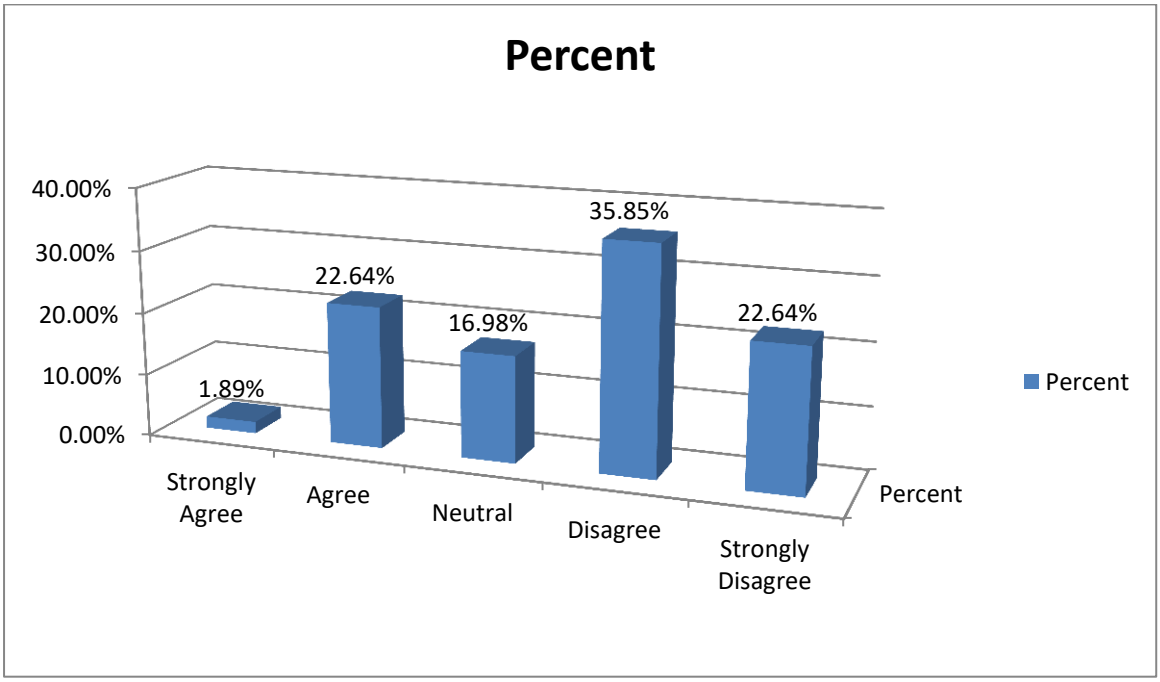
4.6.9 Digital Products are Complex to Use

The following chart indicates that the majority of respondents do not perceive digital banking products as complex to use. Among staff respondents, only 13.0% (4.3% strongly agree and 8.7% agree) believed that digital banking products are complex, while 65.2% (47.8% disagree and 17.4% strongly disagree) rejected this view. Similarly, among

customers, 32.3% agreed that digital products are complex, but a larger proportion of 54.8% (29.0% disagree and 25.8% strongly disagree) disagreed with the statement. These results suggest that most users find digital banking services relatively easy to understand and operate.

The ease of use of digital banking products contributes positively to the operational efficiency of commercial banks. User-friendly digital platforms encourage greater adoption and utilization of services such as mobile banking, internet banking, ATMs, and POS systems. As more customers conduct transactions through digital channels, banks can reduce branch congestion, lower operational costs, improve service delivery, and optimize resource utilization. Therefore, the findings indicate that the simplicity and accessibility of digital banking products support the enhancement of operational efficiency in commercial banks.

Figure 23: Most of the digital products of Commercial banks are complex to use



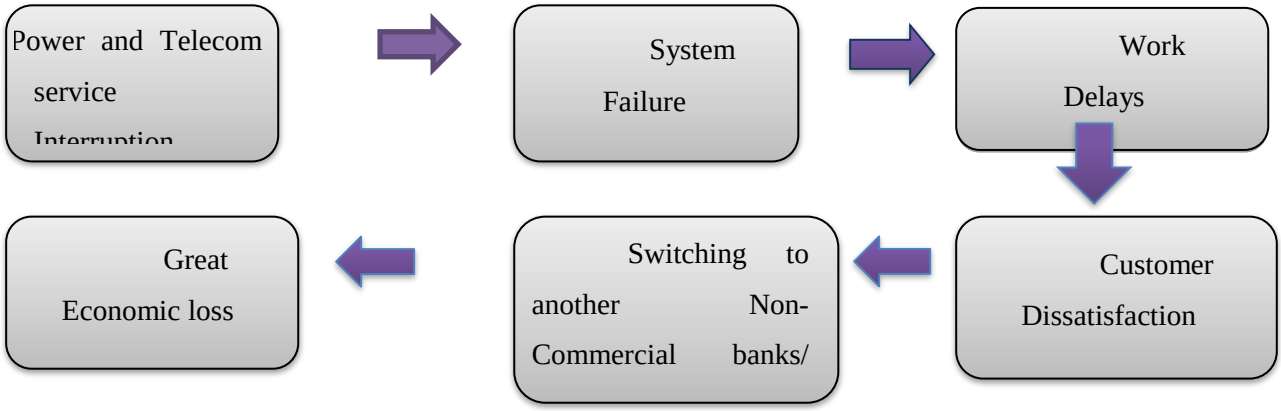
Source: Own Survey, 2025

4.7 The Effects of interruption in Power and Telecommunication services

Economic losses faced by commercial banks as a result of telecommunication service interruptions can be observed in different ways. Currently, most digital banking systems depend heavily on electricity and telecommunication infrastructure. Without power, electronic devices cannot function, and without network connectivity, banking systems used

by commercial banks in Ethiopia become inoperable. Except for the Smart Banking System used in offline branches, most banking operations—particularly those running on the Temenos (T24) core banking system—rely on telecommunication services provided by Ethio Telecom. Therefore, interruptions in either power supply or network connectivity directly disrupt service delivery processes. In addition, frequent power outages impose extra operational costs on banks, including the purchase and maintenance of power generators for branches as well as fuel expenses required to run these generators.

Figure 24: Effect of Interruption in Power and Telecom Services



As shown in the figure above, sustaining customers in the banking sector requires the provision of quality, timely and efficient service delivery. When power or telecommunication interruptions occur, banking systems fail to operate effectively, resulting in delays in service provision and operational inefficiencies. This situation may lead to customer dissatisfaction. Dissatisfied customers may choose to switch to other financial service providers, which can include non-commercial banking institutions in order to access reliable services. As a result, commercial banks in Ethiopia may lose potential customers, leading to significant economic losses. It is generally understood that the loss of customers in any financial institution can contribute to reduced performance and, ultimately, organizational failure. However, it is also possible that some loyal customers may continue to use the bank's services despite such challenges. Furthermore, frequent service interruptions caused by power and telecommunication failures may negatively affect the public image of the bank, which represents a serious reputational risk for the institution.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY OF THE STUDY

This study examined the effect of digital banking services on the operational efficiency of commercial banks in Ethiopia. The study focused on the contribution of digital banking products such as Mobile Banking, ATM services, SMS Alert services, Internet Banking, and Branch Network services to operational efficiency. Data were collected from both bank employees and customers through structured questionnaires. The socio-demographic analysis revealed that the majority of respondents were within the age group of 25–35 years, possessed degree-level education or above, and had moderate to high income levels. These characteristics indicate that respondents were generally familiar with digital technologies and capable of utilizing digital banking services effectively.

The findings showed that Mobile Banking was the most widely used digital banking product, followed by ATM services. Internet Banking and SMS Alert services were used to a lesser extent, while traditional branch banking services were the least preferred by customers. The high utilization of digital banking channels demonstrates the increasing acceptance of technology-based banking services among customers and employees. The study found that digital banking services positively influence customer satisfaction by providing instant transaction notifications, easy access to account information, reduced waiting times, improved service accessibility, and greater convenience. ATM services were found to reduce long queues at branch halls and provide access to banking services regardless of location and time. Similarly, Mobile Banking significantly reduced branch congestion and transaction costs while improving service delivery.

Regarding operational efficiency, the findings revealed that digital banking technologies improve resource utilization, increase transaction volumes, enhance employee productivity, reduce operational costs, and support quick and timely service delivery. Employees strongly agreed that newly adopted digital banking technologies contribute to the productive use of organizational resources and improve service efficiency.

Despite these benefits, the study identified several challenges affecting the effective utilization of digital banking services. These challenges include poor infrastructure, network

communication failures, power interruptions, security concerns, computer illiteracy, ATM downtime, and cash shortages in ATMs during peak periods. These factors limit the full realization of the efficiency benefits associated with digital banking services. The findings further indicated that interruptions in power supply and telecommunication services negatively affect banking operations by causing service disruptions, customer dissatisfaction, operational delays, additional operational costs, and reputational risks for commercial banks.

5.2 CONCLUSION

The study concludes that digital banking services have a significant positive effect on the operational efficiency of commercial banks in Ethiopia. The widespread adoption of Mobile Banking, ATM services, SMS Alerts, and Internet Banking has improved service accessibility, reduced transaction processing time, enhanced customer satisfaction, and increased the productive utilization of banking resources. Digital banking technologies have enabled banks to deliver services more efficiently by reducing branch congestion, lowering operational costs, improving employee productivity, and increasing transaction volumes. The findings demonstrate that digital banking contributes substantially to achieving faster, more convenient, and more reliable banking services.

However, the study also concludes that the effectiveness of digital banking services is constrained by several operational challenges. Poor telecommunication infrastructure, unstable network connectivity, frequent power interruptions, security concerns, ATM service interruptions, and low digital literacy among some users continue to hinder the full implementation and utilization of digital banking products. Therefore, while digital banking has significantly enhanced the operational efficiency of commercial banks in Ethiopia, addressing the existing technological and infrastructural challenges is essential to maximize its benefits and ensure sustainable improvement in banking performance.

5.3 RECOMMENDATIONS

Based on the findings of the study, commercial banks in Ethiopia should continue expanding and promoting digital banking services, particularly Mobile Banking, ATM services, SMS Alerts, and Internet Banking, to increase customer adoption and reduce dependence on branch-based transactions. Banks should invest in modern technological infrastructure and regularly upgrade their digital banking systems to improve service

reliability, transaction speed, and operational efficiency. In addition, commercial banks should collaborate with Ethio Telecom and other relevant stakeholders to improve network connectivity and minimize communication failures that disrupt banking services.

The study also recommends that banks strengthen cybersecurity measures and implement continuous customer awareness programs to increase trust in digital banking platforms and reduce security-related concerns. Since computer illiteracy remains a barrier to digital banking adoption for some users, banks should provide training, awareness campaigns, and user support services to improve customers' digital literacy and encourage greater utilization of digital banking products. Furthermore, commercial banks should improve ATM management through regular maintenance, timely cash replenishment, and effective monitoring systems to reduce ATM downtime and cash shortages, especially during peak hours and weekends. Banks should also invest in reliable backup power systems and alternative energy sources to minimize service interruptions caused by power outages and ensure continuous operation of digital banking services.

Finally, the government, financial institutions, and telecommunication service providers should work together to strengthen the country's digital and communication infrastructure. Improvements in internet connectivity, telecommunication services, and electricity supply will enhance the effectiveness of digital banking services and maximize their contribution to operational efficiency. Future researchers are encouraged to conduct further studies using larger sample sizes and additional variables to provide a broader understanding of the relationship between digital banking and bank performance in Ethiopia.

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APPENDICES

Appendix-A

Research Questionnaire (For CBEs Staffs ONLY)

Dear respondents,

I would like to express my sincere appreciation for your time, honest response, and prompt cooperation. This questionnaire is prepared as part of the partial fulfillment of the requirements for a Master's Degree in Accounting and Finance at Addis Ababa University. The study is conducted to assess the effect of digital banking services on bank performance in Ethiopia, with particular reference to commercial banks. It mainly examines the impact of adopting digital banking strategies in delivering quality services and maintaining operational efficiency. As part of the strategic direction of banks, this study is expected to evaluate the effectiveness of investing in digital banking in relation to bank profitability. It also aims to provide relevant information to stakeholders to support decisions on whether further investment in banking technology is necessary. All information collected will be kept strictly confidential and used solely for academic purposes. Therefore, I kindly request you to spare a few minutes of your valuable time to complete this questionnaire.

THANK YOU FOR YOUR ASSISTANCE.

General instructions

Writing your name on the questionnaire is not required

Please tick (✓) against the appropriate box

1. Background information

1.1) Your gender: Male [ ] Female [ ]

1.2) What is your age category?

Below 25 yrs [ ] 25 – 35 yrs [ ]

36 – 45yrs [ ] 46- 55yrs [ ] 56 and above [ ]

1.3) Your marital status:

Married [ ] Single [ ] Divorced [ ] Widowed [ ]

1.4) Educational qualification

A. Diploma [ ] B. Degree [ ] C. Masters and above [ ]

1.5) Current professional position

A. Officer [ ] B. Senior-officer [ ] C. Manager [ ] D. Director [ ]

1.6) Working experience in Banks

A. Less than 2years [ ] B. 2-5 years [ ] C. 6-10 years [ ] D. More than 10 years [ ]

1.7) What is your average monthly income?

Less than Br 7,000 [ ] Br 7,001-10,000 [ ]

Br 10,001-15,000 [ ] Greater Than Br 15,000 [ ]

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

A. ATM [ ] D. Internet Banking [ ]

B. POS [ ] E. ITM [ ]

C. Mobile banking [ ] F. Mobile Wallet /Money [ ]

2. IMPACT OF DIGITAL BASED PRODUCTS ON PROCESS EFFICIENCY

2.1 Which of the digital product form do you use?

ATM [ ] SMS Alert [ ] Mobile Banking [ ]

Branch Network [ ] Internet Banking [ ]

Please read each statement carefully and place a tick (✓) in the box that best represents your level of agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SMS ALERT					
I receive instant notification of debit or credit on my account					
I have access to account details through SMS					
Automatic Teller Machine(ATM)					
Reduce time involved in bank transactions					
Reduces long queues in banking					

halls					
Enhances ability to access accounts at any location					
Enhances ability to access accounts at any time (Weekends and out of working hour)					
Mobile Banking					
Decreases the number of visits of customers to branches of CBE					
Reduces long queues in banking halls					
Reduce cost and time involved in bank transactions					
Efficiency					
Newly adopted digital products of CBE are useful in productive use of resources.					
Introduction of Digitalization Increased the number of transactions of the performers					

Quick and timely service delivery due to the use of modern banking technology.					

3. CHALLENGES IN USING DIGITAL PRODUCTS OF COMMERCIAL BANKS IN ETHIOPIA.

Please read each statement carefully and place a tick (✓) in the box that best represents your level of agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PROBLEMS IN USING VARIOUS PRODUCTS OF THE BANK					
Majority of customers shy away from digital banking services due to security reasons					
Majority of customers are ignorant about digital service use especially online services					
Computer illiteracy is high					
Poor or lack of technological infrastructure in rural areas					
I am facing					

frequent Network communication error					
I am facing frequent Power interruption					
Most of the time ATMs are out of service					
I am facing shortage of money in ATMs during peak hours or weekends					
Most of the digital products of CBEs are complex to use					

Appendix B

Research Questionnaire (For CBEs Customers Only)

Dear Respondent,

I would like to express my sincere appreciation for your time, honest feedback, and prompt response. This questionnaire is designed for the partial fulfillment of the requirements for a Master's Degree in Accounting and Finance at Addis Ababa University. The study aims to assess the effect of digital banking services on the performance of banks in Ethiopia, with specific reference to commercial banks. It primarily examines the impact of adopting digital banking strategies in delivering quality services and ensuring operational efficiency. As part of the banks' strategic focus, this research is expected to evaluate the effectiveness of investing in digital banking in relation to bank performance and profitability. It will also provide useful information to stakeholders to support decision-making on whether further investment in banking technology is necessary. All information collected will be treated with strict confidentiality and used solely for academic purposes. Therefore, I kindly request you to spare a few minutes of your valuable time to complete the questionnaire.

THANK YOU FOR YOUR ASSISTANCE.

General instructions:

Writing your name on the questionnaire is not required

Please tick (✓) against the appropriate box

1. Background information

1.1 Your gender: Male [ ] Female [ ]

1.2 What is your age category?

Below 25 yrs [ ] 25 – 35 yrs [ ]

36 – 45yrs [ ] 46- 55yrs [ ] 56 and above [ ]

1.3 Your marital status:

Married [ ] Single [ ] Divorced [ ] Widowed [ ]

1.4 Your education level:

No formal education [ ] Diploma [ ]

Primary education [ ] Bachelor Degree [ ]

Secondary education [ ] Master's Degree or above [ ]

1.5 What is your average monthly income?

Less than Br 2,000 [ ] Br 2,001-5,000 [ ]

Br 5,001-10,000 [ ] Greater Than Br 10,000 [ ]

2. IMPACT OF DIGITAL BASED PRODUCTS ON PROCESS EFFICIENCY

2.1 Which of the Digital products do you use?

ATM [ ] SMS Alert [ ]

Mobile Banking [ ] Branch Network [ ] Internet Banking [ ]

Please read each statement carefully and place a tick (✓) in the box that best represents your level of agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BRANCH NETWORK					
I can access funds anywhere branch is located					
Using branch networks has saved my time and transportation cost					
SMS ALERT					
I receive instant notification of debit or credit on my account					
I have access to account details through SMS					
Automatic Teller Machine(ATM)					
Reduces long queues in banking halls					
Enhances ability to access accounts at any location					
Enhances ability to access accounts at any time (Weekends and out of working hour)					

Mobile Banking					
Decreases the number of visits to branches of CBEs					
Reduces long queues in banking halls					
Reduce cost and time utilized to get bank services					

3. CHALLENGES IN USING DIGITAL PRODUCTS OF COMMERCIAL BANKS IN ETHIOPIA

Please read each statement carefully and place a tick (✓) in the box that best represents your level of agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PROBLEMS IN USING VARIOUS PRODUCTS OF THE BANK					
Due to security reasons I don't want to use digital banking services such as ATM, Mobile Banking and others.					
Computer illiteracy is high					
Poor or lack of technological infrastructure in rural areas					
I am facing frequent Network					

communication error					
I am facing frequent Power interruption					
Most of the time ATMs are out of service					
I am facing shortage of money in ATMs during peak hours or weekends					
I faced problems in accessing funds in another branch					
Most of digital products offered by CBEs are complex to use.					

4. DIGITAL BANKING AND OPERATIONAL EFFICIENCY

Please read each statement carefully and place a tick (✓) in the box that best represents your level of agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The uniform customer greetings and closure statements by digital banking services such as ATM attendant gives the feeling of standard Communication to the customer.					
Adoption of digital banking service enables the bank to deliver retail services 24 by 7 to					

customers					
The 24-by-7-by-365 availability of the digital banking service makes customers be loyal to the bank.					
The availability of digital banking as an option to a branch office saves time to customers and minimizes the need for physical engagements with the bank branch.					
Availability of digital banking reduces the need and the cost to establish and operationalize a branch office.					
Availability of digital banking reduce the need and the cost to hire, train, onboard and engage banking officers					
Adoption of digital banking enables the bank to reduce stationary cost by making the transaction ideally paperless.					
Adoption of digital banking products and services reduces the cost of handling transactions by reducing customer visit to the bank branch.					
Adoption of digital banking reduces the cost of handling cash band the risk of carrying					

cash.					
Adoption of digital banking has reduces error committed by employees and customers while transaction has been Made manually.					
Digital banking has contributed a significant role in mobilizing local currency deposit to the Bank.					
Availability of Digital banking products and service such As ATM, ITM and POS has special advantage to the inflow of foreign currency to the Bank.					

5. Are you satisfied with the overall service you receive from Commercial Banks in Ethiopia?

Yes [ ] No [ ]

If No, whay..…….

……

……

……

Thank you for taking time to complete this questionnaire!