# Mekelle University

## College of Business and Economics

## Department of Accounting and Finance

**The Effect of Electronic Payment Systems on Financial Performance of Wegagen Bank Share Company.**

**A Thesis Submitted in Partial Fulfillment of the Master of Science in Finance and Investment.**

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**October, 2025**

**Mekelle, Ethiopia**

## Letter of Certification

The undersigned certify that they have read and hereby recommend to the Mekelle University Business and Economics College to accept the thesis submitted by Abrehe Mehari, entitled "**The Effect of Electronic Payment Systems on Financial Performance of Wegagen Bank Share Company.** " in partial fulfillment of the requirements for the award of Masters of finance and accounting.

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Date _____

Name of Head of Department _____Signature _____

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## Statement of Declaration

I, Abrehe Mehari, declare that the thesis entitled "**The effect electronic payment systems on financial Performance of Wegagen Bank"** is my original work and that all sources of materials used for the research have been well documented**.**

Declared by: Confirmed by:

Name: Abrehe Mehari Advisor: **Abeba Kelelew (Asst. Professor)**

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# Acknowledgements

I would like to express my genuine gratitude to Mss. Abeba Kelelew (Ass. Professor), my principal advisor for her unreserved comments, advice, suggestions and guidance that they made on the paper from the inception to the completion of the study. I also would like to thank her for her support in providing me the necessary materials required for the study and her moral support to finalize the study.

I am very much obligated to all my friends for their frank and enormous support, advice, complete comments and guidance since the inception of the study to its completion. This study would not have been conducted and completed without their support and encouragement that makes me to be keen on the study work.

My sincere thanks also goes to employees and higher officials of Wegagen Digital banking and other personals for their cooperation in providing me the necessary documents and reflections required for the study. I would like to extend my appreciation to them for their support in providing me valuable inputs that enhanced the credibility of the data sources of the study.

Finally, I never forget to extend my appreciation and credit to my family, all my brothers and sister, all respondents and you all whom I did not mention your names for your valuable support and contribution for this study. I am highly grateful to all of you for your support and cooperation in providing me the necessary inputs required for the study.

Abrehe Mehari

# Abbreviations and Acronyms

ATM: Automated teller machine

E-banking: Electronic banking

EFT: Electronic fund transfer

EFTPOS: Electronic Funds Transfer at Point of Sale

E-payment: Electronic payment

ICT: Information Communication Technology

PC: Personal computer

PIN: Personal Identification Number

POS: Point of Sales

ROA: Return on Assets

ROE: Return on Equity

SMS: Short Message Service

SWIFT: Society for Worldwide Interbank financial telecommunication

TAM: Technology Accepted Model

TTF: Task-Technology Fit

# Abstract

*The main objective of the study was to examine the effect of electronic payment systems on financial performance of wegagen bank. The study employed both descriptive and explanatory research design by applying both quantitative and qualitative approaches for which the primary data were collected from lower and higher officials of Wegagen bank through questionnaire and interview respectively. Whereas, the secondary data were collected from the bank's audited financial and system reports. The study used both descriptive and econometric analysis methods. The findings of the study shows that all the electronic payment systems; volume of transactions in ATM, POS, Cards, Mobile and Internet banking have negative significant effect on the performance of ROA and ROE of the bank. This implies that these electronic payment systems have less contribution on the financial performance of the bank. Finally, the study recommended that the bank should create customer initiation and awareness, update the systems and applications of all electronic payment systems, increase the service charges and fees on each services, enhance training and developments to both the customers and employees and introduce technical customer-supporting employees. Moreover, to further improve financial metrics like Return on Assets (RoA) and Return on Equity (RoE), the bank could consider introducing additional digital banking flexible loan products and services that create arrange of customizable loan products that customers can tailor to their financial needs, including options for repayment schedules and interest rates like subscription-based banking services, introduce electronic-commerce solutions, green banking initiatives, microfinance and small business support, customer loyalty and rewards programs, online financial education and resources.*



***Key Words**: ATM, POS, Cards, Internet Banking, Mobile Banking, ROA, ROE, Wegagen bank.*

# Chapter-I: Introduction

## 1.1. Back Ground of the study

In this contemporary world, every organization aims to get the best possible performance from technology via internet. Electronic payment system is of a big importance in the management decision making in banking because electronic payment system must meet certain objectives to keep your business running efficiently (Gallati, 2003). The technological changes that are occurring in business environment, normal bank working hours tend to become very short as people would wish to operate twenty four hours in order to cope with those changes. There a strong need for electronic payments systems within which customers may do banking transactions without having to stand on long queue waiting to pay bills, deposit or retrieve their money. The usual method of banking such as cash payment, checks, payment order and bank transfer is very costly and time consuming as customers have to wait to the bank for long hours, yet they are limited by bank closing hours.

The performance of banks is evaluated from a variety of perspectives in utilizing both financial and non-financial indicators. Hughes and Mester (2015) identify non-structural and structural approaches to measuring the performance of banks. Non-structural approaches utilize a variety of performance metrics; including return on Equity (ROE), return on Assets (ROA), net interest margins, and Tobin's q-ratio, among others. In contrast, structural approaches rely on theoretical models of banking behavior, including efficient and profit frontiers (Ephraim & Kalama, 2022). Efficiency measures how well a bank converts inputs into outputs in comparison to other banks in the same industry. As intermediaries between depositors and borrowers, banks distinguish themselves from other business entities. Therefore, banks' performance must be evaluated in light of the financial intermediation process. Banks' financial stability is determined by their overall long-term financial performance.

Similarly, Michael and Enang (2022) investigated the relationship between credit risk and bank performance in Nigeria, discovering that Non-Performing Loans (NPLs) had a positive relationship with ROE. From 2008 to 2019, Isayas (2022) estimated the determinants of 14 commercial banks' profitability in Ethiopia using the generalized method of moments (GMM)

estimation of dynamic panel data. It was discovered that firm size, liquidity ratio, asset tangibility, capital adequacy, leverage, and real Gross Domestic Product (GDP) growth rate have a positive and statistically significant effect on bank profitability in Ethiopia, whereas firm age and inflation rate have a negative but statistically insignificant effect. Using a panel data analysis, Lawa et al. (2021) investigated the factors of bank performance in South Africa. Many customers are opting for online banking because it is a more convenient option than traditional branch banking (Kumbhar, 2017). According to Sameni et al. (2015), online banking facilitates electronic commercial transactions without requiring a visit to the bank. According to Bank of Tanzania, 2020, the usage of mobile money which is one of the electronic services has an increase of 21.8 percent in volume and 8.9 percent in value compared with 2018/2019 usage of electronic transactions as quoted in (Mswahili, 2022).

Many experts in the financial field confirm that the banking industry principally witnessed a period of transformation, when it commenced to adopt contemporary technologies, primarily those related to electronic payment systems (Sobhi, 2021). This quantum leap has led to a rise above routine business and paying more attention to strategies and policies that help to move the banking business ahead. Consequently, electronic payment methods or E-Payment will replace the traditional payment methods and thus provide digital financing services or what is known as "E-Banking" in various forms that are compatible with the nature of operations and deals, and different needs of customers (Mohsen & Habbaz, 2019). Technological progress is also one of the most important variables that participated in changing the course of the banking industry, as there has been a significant change in the form of banking. It has changed due to the direct reliance on modern technology in providing banking services and developing them with high efficiency in order to create new banking services and developing the methods of providing them to ensure the flow of banking services from banks to a customer with ease and accuracy, as well as improving bank performance (Hammou & Zidan, 2016; Mokadem & Muwafak, 2021). Doubtlessly, the recent technological development has led to various changes and progress in banking.

Electronic system is so important in promoting investments not only in Rwanda but also in other countries (Bosco, 2018). The card that is mostly used is domestic debit card that is used only by account holders E-banking has been used by many banking institutions, rather they have used

other forms of information technology (IT) in order to enhance their efficiency and effectiveness through speeding up their activities. However, the extent to which IT services are used is not sufficient and fully embraced whereby in many banks you find long lines of bank customers on the floors.

Electronic banking provides a bouquet of new channels like internet banking, telephone banking and ATM –which are different from traditional, telephone banking and ATM –which are different from traditional brick and motors branches banking and which have made it possible "anywhere and anytime" banking (Bosco, 2018). It contributed to speed, accuracy and confidentiality of customer's transactions while enhancing customer convenience. Funds transfers, checks clearing and collection of bill of exchange are also done electronically with accuracy, speed and safety (Kaufman, 2007). According Kaufman (2007) Internal housekeeping is done accurately and much faster through programmed packages /software at the branch and also at centralized platform different operation internationally (cross-banking, foreign banking).

The objectives or goals can be in financial or non-financial terms. Performance may be determined by macro and micro-factors. According to Oliver (2000) macro-economic factors are those pertinent to a broad economy at the regional or national level and affect a large population rather than a few select individuals. Macro factors include GDP growth, inflation, unemployment, interest rates, exchange rate and level of competition. Micro factors include individual risk exposure, operating strategies and degree of management strategies. According to Cooper (1992), factors which influence business performance are experience, education, occupation of parents, gender, race, age and entrepreneurial goals. Lerner and Hisrich (1997) conducted a study on Israel women entrepreneurs and found that their performance was influenced by factors that he grouped in 5 perspectives: motivation and goals, social learning theory (entrepreneurial socialization), network affiliation (contacts and membership in organization); human capital (level of education and skills) and environmental influences (location, sectored participation and social political variables) (Bosco, 2018).

According to Bantyergu (2022), e-banking is still in its infancy in Ethiopia. By deploying ATMs in late 2001, the Commercial Bank of Ethiopia (CBE) introduced e-banking to Ethiopia for the first time. E-payment systems, which include internet banking, mobile banking (MB), and agent banking, are increasingly being adopted by banks nowadays. Many banks are now investing

heavily on technology to maintain and modernize their infrastructure. Hence, this study explores how Ethiopian commercial banks' performance is affected by e-banking services.

Electronic payment systems have become increasingly popular in developing countries, including Ethiopia, due to their potential to increase financial inclusion, enhance financial efficiency, and promote economic growth. Studies have explored the impact of electronic payment systems on the financial performance of commercial banks, highlighting both the opportunities and challenges associated with these systems. Adopting the new technology is also has its own problem as it is stated in different e-payment system research among those problems low level of internet penetration and poorly developed telecommunication infrastructure, lack of suitable legal and regulatory frame work for E-commerce and E- payment, low literacy rate and lack of competition among local and foreign competition is the major one.

Moreover, in Ethiopian banking industry like Wegagen bank, cash is still the most dominant medium of exchange and electronic payment systems are at an early stage. All banks in Ethiopia are too late to move with technological advancement and they should clearly chart out the time schedule for their integration and technological advancement. Some of the banks even today do not have their own websites which can help them to provide at least the information on financial services offered by them. In order to encourage further E-payment system adoption and its effect on financial performance in developing countries, a better understanding of the barriers and drivers of E-payment systems is critical to improve the banking industries' service delivery and financial performance by enhancing customers' satisfaction, loyalty and retention. By gaining an in-depth understanding of the factors, effects and conditions that influence developing country" ability to fully adopt and realize its benefits, effects and strategic implications on financial performance can be generated for the researchers and practitioners regarding how to promote the growth of E-payment system in the developing countries like Ethiopia.

Wegagen bank is doing its business facing challenges while using electronic payment systems like ATMs, POS, Debit and Credit Cards, Mobile and Internet banking services in order to facilitate customer services, minimize cost, alleviate branch burdens, earn foreign exchange, . They are also looking into the future to increase access to their customers using their ATM machines together, use latest technologies by importing more ATMs and by making deals with Ethiopian Telecommunication Corporation to receive special attention to stay all the time

connected, raise awareness level and make the unbanked nation ATM card users and create cashless banking society. Hence, the effect of electronic payment systems on financial performance of banks should assessed and reassessed to resolve the challenges and problems associated with the electronic payment system services.

## 1.2. Statements of the Problem

Due to the quick development of information technology and the fierce competition in the banking industry, the use of electronic banking as a channel of distribution for financial goods and services has become quite widespread (Bantyergu, 2022). In anticipation that the new technology system will increase their profitability and market share, financial institutions have been pouring billions of dollars into it. However, if the buyers do not embrace or fully utilize it, the anticipated return could be smaller. Additionally, there is growing worry that electronic-banking is not producing the desired outcomes for the business and customer satisfaction (Nyangena & Muturi, 2015).

The study by (Hammou and Zidan, 2016) showed that the problem of banking technology lies in electronic payment methods and systems and communication channels. The study also showed that the advanced technology positively affects the performance and competitiveness of financial institutions if they are better exploited; and therefore it is necessary to benefit from the experiences of leading banks in the field of information technology employment and management. There is also an urgent need for banks to enhance awareness among customers in order to raise the level of electronic readiness for them and thus enhance the banks' performance.

The study by (Sobhi, 2021), recommends that Palestinian banks in general and the Bank of Palestine in particular should play an effective role in adopting various electronic payment methods such as the application of electronic payment methods, which is still shy. There is also an urgent need to provide an advanced technological infrastructure that is needed to adopt the application of electronic banking services, including electronic payment methods. There is also a need to conduct media campaigns in order to extend banking awareness and consolidate the culture of online banking among individuals. Supervisors and regulators (such as the Palestinian Monetary Authority) should then direct banks towards protecting and reducing risks to facilitate

the use of electronic payment tools and enhance their role in improving the financial performance of banks.

The growth rate of that technology, in addition to the scope of banks' ability to make use of the remarkable progress in information technology and communication in an approach that helps and enhances their performance level (Sobhi, 2021). The study problem is one of the most eminent topics in the banking industry. It tests the impact of electronic payments on the financial performance of the oldest and most important Palestinian bank (Bank of Palestine). This is because these methods are among the most significant means applied in E-commerce operations. They also ease making transactions that take place at the international level, which is reflected on the bank's performance, meets the changing needs of customers, and provides various banking services and products.

Given this background, the current study sees the value of electronic payment systems on the financial performance of Wegagen bank. This is because electronic payment systems facilitate electronic commercial transactions without requiring customers to visit the bank. This, in turn, improves financial inclusion and has a positive implication on the financial performance of commercial banks ~~in Tanzania~~ (Sameni et al., 2015; Ishengoma, 2011). The study done in Ethiopia and other countries commercial bank found that electronic payment system has a great impact on financial performance, as it increases profitability, return on assets, return on investment, return on equity and loans, improves bank management quality, increase bank assets and promotes bank growth and expansion. Regardless of the value highlighted from other contexts, there is limited information on its impact in Ethiopia. Few studies have been conducted on the area by considering the electronic banking products; ATM, POS, cards, Mobile and Internet banking. Moreover, as the electronic payment technologies developed from time to time, new changes bring to customers as well as the banking industry, which in return needs further study on their effects to financial performance of the commercial banks particularly wegagen bank. It is because of this reason that this study determined the effect of electronic payment systems on the financial performance of wegagen bank, Ethiopia. Hence, the study will be intended to investigate the effect of electronic payment systems; ATM, POS, Cards, Mobile and Internet banking on the financial performance of Wegagen bank.

## 1.3. Research Questions

- How does ATM banking influence the financial performance of Wegagen bank?
- How POS banking does affect the financial performance of Wegagen bank?
- What are the effects of Card Payment banking on the financial performance of Wegagen bank?
- How Mobile banking does affects the financial performance of Wegagen bank?
- What are the effects of Internet banking on the financial performance of Wegagen bank?

## 1.4. Objectives of the study

### 1.4.1. General Objective

The general objective of the study was to examine the effect of electronic payment systems on financial performance of Wegagen bank.

### 1.4.2. Specific Objectives

The specific objectives of the study will be;

- To ~~recognize~~ identify the effects of ATM banking on the financial performance of Wegagen bank.
- To ~~assess~~ determine the effects of POS banking on the financial performance of Wegagen bank
- To determine the effects of Card Payment banking on the financial performance of Wegagen bank.
- To examine the effects of Mobile banking on the financial performance of Wegagen bank.
- To ~~assess~~ determine the effects of Internet banking on the financial performance of Wegagen bank.
- To segregate the overall effect of electronic payment systems, by controlling the effect of other factors, on Wegagen Bank's financial performance.

## 1.5. Scope and limitation of the study

The scope of this study was limited and delimited on one commercial banks, Wegagen bank, out of thirty-two in Ethiopian commercial banking industry that provide all or some of the five

electronic banking products; ATM, POS, Cards, Mobile and Internet banking due to the budgetary and time constraints. Similarly, the study will cover the financial audited reports from the year 2018 to 2024. This is because these are the common periods when the selected bank relatively started delivering on the five selected electronic banking products, starting from 2018. Conceptually, the study specifically will investigate the use of ATMs, POS, Cards, mobile and internet banking as these is the e-banking products that were mostly in use in Wegagen bank SC. Specifically, this study tried to investigate the effect of electronic payment systems (ATM, POS, Cards, Mobile and internet banking) on return on asset (ROA) and return on Equity (ROE) of wegagen bank.

## 1.6. Significance of the study

The purpose of this research is to investigate the factors that affect the effect of electronic payments on ATM, POS, Cards, Mobile payment, and internet payment on the financial performance of wegagen bank in Ethiopia. Owing to the paucity of research in this area, the project will do two things: 1. create a platform for academics to debate the effect of the electronic payments system on the financial performance of Wegagen bank over the time period from 2018 to 2024. Policy makers and the central bank in particular as it is charged with supervising private banks, may benefit from a better understanding of the vulnerabilities and weak points that need to be significantly regulated and strengthened in the banking sector. Third, practitioners believe that this information could help the appropriate authorities strengthen their monitoring and enforcement. Finally, the research could also shed light on Somalia's economic climate. In addition, banks and other financial organizations will gain from this study because it highlights the issues and the necessity of a solution.

## 1.7. Organization of the Paper

This study will have five chapters. The first chapter will consist of the introduction part, background of the study, statement of the problem, objectives of the study, scope and limitation of the study, significance of the study. Chapter two will deal with review of related literature. Chapter three will contain the research methodology. Chapter four will focus on data presentation, analysis and interpretation. Finally, the fifth chapter will deal with conclusions and recommendations forwarded from the findings of the study.

# Chapter-II: Related Literature Review

## 2.1. The concept and development of Electronic Payments

The technological changes that are occurring in business environment, normal bank working hours tend to become very short as people would wish to operate twenty four hours in order to cope with those changes (Bosco, 2018). There a strong need for electronic payments systems within which customers may do banking transactions without having to stand on long queue waiting to pay bills, deposit or retrieve their money. The usual method of banking such as cash payment, checks, payment order and bank transfer is very costly and time consuming as customers have to wait to the bank for long hours, yet they are limited by bank closing hours.

Electronic system is so important in promoting investments not only in Rwanda but also in other countries. The card that is mostly used is domestic debit card that is used only by account holders E-banking has been used by many banking institutions, rather they have used other forms of information technology (IT) in order to enhance their efficiency and effectiveness through speeding up their activities (Bosco, 2018). However, the extent to which IT services are used is not sufficient and fully embraced whereby in many banks you find long lines of bank customers on the floors waiting for banking services. This has created some problems like time wasting, loss of customer's reputations, thereby unconvincing and hindering the international travelers such as tourists (Gallati, 2003).

Payment systems refer to the legal, regulatory, and standard-based network that connects bank accounts and provides the required functionality for monetary exchange using bank deposits (Bosco, 2018). It is a set of institutions, organizations, instruments, regulations, standards, procedures, and technical processes that enable the transfer of monetary value between parties who are fulfilling mutually agreed-upon responsibilities (Massimo & Gracia, 2008; summers, 2012). Electronic payment systems, according to Harelimana (2018), are a type of inter-organizational information system for monetary transaction that connects multiple organizations and individual consumers. This may necessitate intricate relationships among stakeholders, technology, and the environment. Payment systems can be physical (traditional) or electronic (virtual), with information and communication systems used to supply the required services. As a result, electronic payment systems are information communication technology-based systems

designed to make monetary transactions between parties using bank-based platforms more convenient. Automated Teller Machines (ATMs), Point of Sale (POS) machines, Mobile Banking, and Internet (Online) Banking Platforms are all functioning electronic payment systems in Nigeria. Because the services can be evaluated on electronic devices owned by individual clients, the final two choices promise higher ease and wider utilization.

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## 2.2. Classification of Electronic Payments

There are several mechanisms of electronic payments in the digital world. Some of the main electronic payment systems are as indicated below;

**Automated teller machines (ATM)**: An automated teller machine (ATM), also known as automated banking machine (ABM) or cash machine is a computerized telecommunications device that provides the clients of a bank with access to banking transactions in a public space without the need for a cashier, human clerk or bank teller. While using modern ATMs, the customer is recognized by inserting a plastic ATM card with a magnetic chip that contains a unique card number and some security information such as an expiration date (Thompson, 1997). According to Thompson (1997), authentication is provided by the customer entering a personal identification number (PIN). ATM banking enable customers to access their bank accounts in order to make cash withdrawals, check their account balances, furthermore, as the ATMs continue when human tellers stop, therefore, there is continual productivity for the banks even after banking hours (Yosef, 2017). The primary advantages of ATMs are they save the

customer’s time in service delivery and it is cost efficient way of yielding higher productivity per period than human tellers.

**Electronic funds transfer system**: it is the electronic exchange or transfer of money from one account to another, either within a single financial institution or across multiple institutions, through computer-based systems (Bahia, 2007). Bahia (2007) further stated that EFT is also a way of transferring money from one bank account directly to another without any paper money changing hands. One of the most widely-used EFT programs in our country is direct deposit, in which payroll is deposited straight into an employee's bank account, although EFT refers to any transfer of funds initiated through an electronic terminal, including credit card, ATM, and POS transactions.

**Points of Sales (POS)**: it is one of the electronic devices used to withdraw, transfer and make deposit. With an electronic POS terminal, customers can pay for products and services immediately; it's also very easy to use and comes equipped with a variety of useful features. It streamlines the process of receiving and sending money to/from a customer's account, allowing the operators to keep accurate financial records (Bahaa, 2021; Onwuchekwa, Fawe & Benwari, 2022). Cash transactions have been greatly decreased due to the use of point-of-sale device. When it comes to making purchases, Ayodele (2014) defined the point of sale as the payment gateway used by cardholders. Using the terminal has several benefits, including simplified payment processing, time savings, and peace of mind.

On the other hand, **POS banking** is a system that uses a computer terminal located at the point of sales transaction so that the data can be captured immediately by the computer system. It is also a retail payment system that substitutes an electronic transfer of funds for cash, cheques or drafts in the purchase of retail goods and services (Gerlach, 2000). As of Gerlach (2000), in a POS banking system, sales and payment information are saved electronically, including the amount of the sale, the date and place of the transaction, and the consumer's account number. If the transaction is done on a bank credit or debit card, the payment information is passed on to the financial institution or payment processor, and the sales data is sent to the seller's management information system for updating of sales records.

**Mobile banking**: it is a system that allows bank customers to conduct different financial transactions through a mobile device, being the newest service in electronic banking; mobile banking relies on WAP (wireless application protocol) technologies since a mobile device requires a WAP browser installed in order to allow access to information (Driga & Isac, 2014). In developing countries where modern telecommunication infrastructure is not well advanced, mobile technologies is transforming accessibility to the internet based services (Driga & Isac, 2014). Currently almost all commercial banks in Ethiopia are making significant investments in mobile banking systems to deliver a wide range of banking service, to reach on increased efficiency, cost reduction, improved operational effectiveness and improved customer service and to achieve the aim of financial inclusion (NBE, 2015). Mobile banking may be described as the newest channel in our country electronic banking channel to provide a convenient way of performing banking transaction using mobile devices (Tigist, 2018). The mobile banking development in Ethiopia is not full-fledged in terms of exhaustively utilizing all the mobile services one can get. Currently, of all the types of mobile banking services, mostly customers of the bank use notification or alarm inquiry (NBE, 2015).

**Internet banking**: it refers to systems that enable bank customers to get access to their accounts and general information on bank products and services through the use of bank's website, without the intervention or inconvenience of sending letters, faxes, original signatures and telephone confirmations (Witman & poust, 2008). According to Simpson (2002), banks offer internet banking in two main ways. First, an existing bank with physical offices can establish a web site and offer its customers internet banking in addition to its traditional delivery channels. Second, a bank may be established as a "virtual," "branchless," or "internet only" bank, with a computer server at its heart that is housed in an office that serves as the bank's official address. Simpson, further explained internet only banks may offer customers the ability to make deposits and withdraw funds at automated teller machines or other remote delivery channels owned by other institutions

**Cards Payment banking**; it is a specific type of payment card accepted by banks affiliated with the Visa network is referred to as a Visa card. One of the biggest payment technology businesses in the world, Visa Inc., is in charge of managing a global payment network that facilitates electronic money transfers and transactions (Mehammednur, 2019). Credit, debit, and prepaid

cards are among the Visa card types that bear the Visa logo. Cardholders can use these cards to make purchases, withdraw cash, and conduct other financial transactions at millions of dealers and ATMs worldwide. Furthermore, because these services offer flexibility, they are crucial for streamlining transactions for businesses and consumers, security and simplicity in managing finances (Consumer Financial Protection Bureau, 2020; Federal Reserve Board, 2019; World Bank, 2018). Below is an overview of card services offered by the banking sector (Girmay, 2016; Okoye, 2013):

▪ **Credit Cards**: Customers can borrow money with credit cards for cash back down to a predetermined amount, bill payment, or buy-in. Users have a set amount of time, usually once a month, to repay the borrowed money plus interest. Features on credit cards include travel perks, rewards points and cash back. Because they are accepted anywhere in the world, they are a practical method of payment for many different kinds of transactions.

▪ **Debit Cards**: Because debit cards are linked directly to bank accounts, users can use them to make purchases or withdraw cash up to the amount available in those accounts. Debit cards function similarly to credit cards in that transaction is promptly deducted from the user's account; there is no borrowing involved. Debit cards are convenient and easily accessible for regular transactions.

▪ **Prepaid Cards**: Prepaid cards allow the cardholder to load a predetermined amount of money, which they can then use for payments and purchases until the entire balance is used up. Due to their lack of a bank account need and credit check, these cards are accessible to individuals who might not be qualified for traditional banking services. Prepaid cards are often used for online shopping, travel and budgeting.

## 2.3. Theories Relating to Electronic Payments

This sub-section presents the theoretical foundation for digital banking impacts on commercial banks' financial performance. Accordingly, the following theories are discussed.

**Transactions Cost Innovative Theory (TCIT)**

Coase in 1937, in his paper "The Nature of the Firm", introduced and laid the foundation for the "transaction costs and the theory of the firm" (Coase, 1986). Williamson (1979, 1981,1986),

known as one of the founding fathers of “Transaction Cost Economics”, further developed this concept in to the “Transaction Cost Theory.” According to Williamson, transaction costs is considered as the costs of running an economic system of companies, and unlike production costs, decision-makers determine strategies of companies by measuring transaction costs and production costs.

Theoretically, the principal potency behindhand financial novelty is decrease in costs of transaction; but, in reality, financial novelty is a reply to progressions of technology that have led to reduced transaction costs. Financial services can be enhanced and financial innovation can be encouraged by lowering transaction costs. The argument that financial novelty decreases costs of transaction is made further in the statement. As it explains, the precise link between digital banking (independent variable) and efficiency of cost (dependent variable), this theory is especially pertinent to this situation. According to Mehammednur (2019), the reduction of transaction cost can accelerate financial innovation and improvement of financial service. Further, it states that financial innovation reduces transaction costs. This theory is also relevant in this context: since it states clearly the relationship between independent variable of electronic banking and dependent variable of cost efficiency. Consequently, reduction of operation costs through ATM, POS, internet banking, mobile banking and other electronic banking product may contribute to improvement in financial performance of the bank. Therefore, reducing operational costs with products of digital banking including ATM, mobile, internet, and Point of Sale (POS) banking may improve the bank's financial performance.

**Contemporary Banking Theory (CBT)**

In 1984 Diamond laid the groundwork for the concept of “contemporary banking theory.” His work focused on financial intermediations, debt markets, bank runs, liquidity risk management, and the role of banks in the economy. Subsequently, the “contemporary banking theory” was first put forth by Bhattacharya and Thakor (1993).

The economy cannot efficiently allocate its capital resources without the assistance of commercial banks and other financial intermediaries, claims current banking theory. This shows that there is great potential for improving bank performance and, eventually, broad-based development in the banking industry if it employs ICT to run efficiently. Moreover, it reduces the probability of asymmetric knowledge leading to moral hazard issues and adverse selection.

This theory has significant advantages for the digital banking (independent variable) and commercial banks financial performance (dependent variable).

Customers can readily get information about banking products and amenities via digital banking, eliminating the need to visit old-style bank twigs, which used to be the principal point of interaction flanked by the bank and its customers. Information regarding bank products is now easily accessible via contemporary channels of digital banking, increasing financial enclosure and, as a result, performance of finance. The security is further strengthened with the help of multi-factor authentication and other technology, capable of running continuously and uninterrupted 365 days a year (Kapoor, 2010). Bank focused theory is relevant to this study as it is concerned with the use of non-traditional low-cost delivery channels like ATMs, internet banking or mobile banking solutions to provide banking services to its existing customers (Mehammednur, 2019). This theory contributes to the independent variables electronic banking since it explains how commercial banks use non-traditional inexpensive delivery channels in providing banking services to improve their performance.

**Innovation Diffusion Theory (IDT)**

Rogers (1962, 1983, 1995) published a paper titled "Diffusion of Innovations" and regarded as the founding father of the "Innovation Diffusion Theory." The idea of diffusion of innovation was aimed to explain and describe the processes by which new technologies, like electronic banking in this instance, is embraced and succeeds. Even with very outstanding ideas, adoption of breakthroughs might be sluggish. Not every innovation finds an immediate audience. He goes on to add that, even if it doesn't totally impede innovation, resistance to change may act as a hindrance, slowing it down. Additionally, five key traits that significantly influence the adoption rate were identified by Rogers. Compatibility, attainability, intricacy, relative benefit, and serviceability are a few examples.

The IDT, which firms actively share novelty to obtain a competitive edge, reduce costs, and safeguard their strategic positions, was first presented in 2002 in a formal form by Bradley and Stewart (2002). Utilizing this concept as a basis, this study looked at by what means numerous products of digital banking impact commercial bank's performance in relation to finance. This theory was used as basis in this study to 18 investigate how various electronic banking products affect financial performance of commercial banks (Mehammednur, 2019).

## Bank-Focused Theory (BFT)

This concept holds that a normal bank practices non-traditional, reasonable distribution methods to deliver banking amenities to its present clients. Using mobile banking and automated teller machines, banks can provide their customers with a limited range of financial services at a lower cost. This notion was developed by Kapoor (2010) as described in Muze (2019). Accepted as a minor extension of traditional branch-based banking, ATM use is free of charge. For the relevant financial institutions, this results in advantages like enhanced control and branding visibility. However, issues with the service's stability and accessibility, identity and transaction protection, experience, and allowed level of personalize remain. To help with these issues and concerns, financial institutions provide computerized banking services with an easy-to-use portal. According to Kapoor (2010), other measures to enhance security include multi-factor authentication and technology that can function continuously and error-free for a whole year. The bank-centered concept is pertinent to this research because it discusses the practice of not adhering past practices, channels with cheap transfer, solutions including ATMs, mobile, or online banking, to offer banking amenities to its current consumers. This concept adds to the digital banking (independent variables) as it characterizes how non-traditional channels with cheap transfer to supply financial amenities in order to increase their performance.

Therefore, the Transactions Cost Innovative Theory (TCIT), Cotemporary Bank Theory (CBT), Innovation Diffusion Theory (IDT), and Bank Focused Theory (BFT) are the theoretical foundations for this study. The TCIT describes minimization of working costs with digital banking products including POS, internet, mobile and ATM banking which results in enhancing the financial performance of commercial banks; CBT argues modernizing the banking system using ICT enables commercial banks to operate efficiently that results in increasing their financial performance; IDT emphasizes that incorporating unique or novel digital banking products enables to improve the financial performance of commercial banks and finally, BFT designates the digital banking products with low-cost improves the financial performance of commercial banks.

## 2.4. Empirical Literature Review

Several studies have been conducted on benefits, challenges, prospects and effects of electronic payments on financial performance of commercial banks such as Ken (2013) exposed that because of the many clients that are borrowers with computerized accounting System more importantly its ability to produce and present relevant and faithful representative financial reports to end users, the government of Rwanda is assisting microfinance to transfer into a common computerized Accounting System. This is going to serve as a platform in which all the rural microfinance in the country are going to be networked to each other to facilitate faster and efficient banking. He concluded that electronic payment system is necessary to identifying, analyzing, assessing, treating, monitoring and communicating of organization. Electronic payment system therefore plays five main functions in an organization. The first requirement of control is to devise a system of measuring the contributions made by each teller. In addition, electronic payment system helps banking institution to identify, analyze, assess, treat, monitor and communicate by each participant and distribute the needed information. Furthermore, electronic payment system identify the borrower and market factors that enter into the credit decision to find replacements for borrower who did not paid the loan. Finally, electronic payment system makes some information available in the form of common knowledge to help reduce conflict among borrowers at the time they negotiate their contracts (Ken, 2013).

Oladejo (2016) looked at the influence of POS adoption on bank profitability in Nigeria from 2005 to 2012, using panel logistic regression to analyze the data. The findings revealed that when banks use e-payment systems, their performance levels vary, including gross margin, profit after tax, return on assets, and return on equity. Globalization has had an impact on the development of commercial banks in Nigeria.

Bosco (2018), in his study states that the study entitled ‘’ the role of electronic payment system on the financial performance of financial institutions in Rwanda: a case study of Equity Bank Ltd was carried out under the period from 2012 to 2016. Both primary and secondary data were collected from 253 total populations from which a sample of 155 was drawn. A questionnaire and interview was used in data collection. Data collected was analyzed using descriptive statistics and linear multiple regression analysis and then presented in statistical tables. The results show that the factor influencing access to electronic payment was simple application

procedures for loan with 33.5 percent. This was followed by low collateral requirements with 20 percent Low costs of accessing finance with 20 percent and Low interest rates which had 4.5 percent. Guarantee from government with a 22 percent was the least factor that influencing customer's access to electronic payment. This shows that all the determinants of electronic payment were considered relevant by respondents in accessing electronic payment system. Other role of electronic payment by equity bank ltd is to meet expenditures which accounted for 21.9 percent of the responses. It was found that the four independent variables moderately predict the performance of Equity bank ltd that means the model explains 68.6 % the variance on the performance of equity bank ltd. The results confirm the hypothesis because the linear regression F-test results ($F = 8.741$; and 5 df) are significant at $p < 0.05$.

The study by (Muhammednur, 2019) states that electronic banking systems are expanding due to the great economic benefits in case of reducing banks costs and increasing their profitability. In spite of the spreading use of the e-banking as a delivery channel in Ethiopian commercial banking industry´, there is a relative dearth of empirical studies that provide a quantitative analysis of the effect of the e-banking service on banks´ performance. Because of this fact, this study is conducted to fill this gap. The main objective of this study is to investigate the effects of e-banking on financial performance of commercial banks in Ethiopia. To achieve this broad objective, specifically the study investigated the effect of automated teller machine, point of sale, internet and mobile banking on the profitability and cost efficiency of selected commercial banks in Ethiopia. Explanatory research design with quantitative approach was employed. The study used secondary data from purposely selected seven commercial banks for the period of 2013 to 2018. Both descriptive and inferential statistics with panel data regression model were adopted to analyze the data. The study finding with the aid of STATA version 14 using fixed effect panel data model reveals that usage of ATM, mobile banking and bank size had significant positive effects on ROA. However, usage of POS banking had significant negative effects on ROA. On the other hand usage of POS, mobile banking, internet banking and bank size had insignificant effects on operating cost rate of commercial banks in Ethiopia. But, usage of ATM banking had significant negative effects on operating cost rate. Generally, electronic banking had positive effect on financial performance of commercial banks in Ethiopia. Even the result of some variables influences negatively but, it is clear that usage of e-banking is promising activity to attain financial inclusion and improve the performance of commercial banks in Ethiopian.

Therefore, this study recommends for enhancing return on asset and cutting operating cost, it is better for commercial banks in Ethiopia to exert more on usage of e-banking by crating awareness, adopting latest e-banking product and expanding those e-banking products across the country.

Bantyergu (2022), in her study examines the impact that POS, ATM, mobile banking, and bank size have on the performance of commercial banks was the study's explicit goals. The study solely employed a quantitative methodology. Nine commercial banks were chosen using a purposive selection technique and their secondary data for the five-year period of 2017 - 2021 was collected. Fixed effect panel regression results showed that the number of ATMs has a negative and statistically significant impact on bank performance as measured by ROA, the number of POS machines was found to have a negative but statistically insignificant impact on bank performance. On the other hand, the number of mobile banking users has positive and statistically significant impact. Finally, the number of ATMs was found to have no effect on the bank performance.

The research conducted by (Sobhi, 2021) explores electronic payments, which are considered one of the most important tools in financial technology. Hence, electronic payments play a great role in enhancing the financial performance of the Bank of Palestine. The study uses three dependent variables such as return on assets (ROA), return on equity (ROE) and earnings per share (EPS). The study methodology employs a descriptive and analytical approach to investigate the bank's data during the period of 2010–2019. Hence, the findings show that electronic payment methods have an important impact on the bank's financial performance, through the return on assets and equity indicators, which helps to reduce costs and thus increase profits. However, there is no statistically significant effect on the earnings per share. What is more, the Bank of Palestine uses a wide variety of electronic payment methods. Thus, the study suggests the necessity to increase the effectiveness of the information security from fraud risks, in addition to activating supervisory and regulatory authorities (such as the Palestinian Monetary Authority), to strengthen the application of electronic payment tools.

Another researcher Abdulkadir (2023) states that small and medium-sized enterprises (SMEs) play a crucial role in the Somalian economy, helping to create jobs, spur innovation, and reduce poverty. Many small and medium-sized enterprises (SMEs), however, have difficulty gaining

access to conventional banking and other forms of formal financial services. Somalia's reliance on cash-based transactions limits the country's economic potential, slows the country's development, and puts small and medium-sized enterprises at danger. These problems might be solved and the financial landscape for SMEs completely revamped with the adoption of electronic payment systems. After collecting information from participants, we used SPSS V25.0 to analyze the results. Both descriptive and inferential methods will be used in the study. The mean, standard deviation, frequencies, and histograms are all common descriptive analyses. The purpose of inferential analysis in statistics is to form inferences about the connections between variables. Multiple regression analysis will be used to establish a causal relationship between a dependent variable and its explanatory variables. The results of the study indicate that there is significant relationship between electron payment and financial performance. In sum, the adoption of Electronic Payment System has had a profound effect on the economic health of Somalia's SMEs. Small and medium-sized enterprises (SMEs) who adopt electronic payment systems see improvements in cash flow management, market penetration, customer satisfaction, and bottom line profitability. However, maximizing the promise of electronic payment systems for SMEs in Somalia requires solving the constraints of infrastructure, connectivity, and awareness. The implementation of electronic payment systems has the potential to boost Somalia's economy as a whole by bolstering the growth and development of small and medium-sized businesses.

Ephraim and Kalama (2022), in their paper investigated the effects of e-banking on the profitability of commercial banks as a measure of their financial performance. The study is pertinent since e-banking is a significant innovation that hinders bank operations in both urban and rural areas. A case study design and a quantitative approach were adopted. The study population consisted of 171 individuals, from whom 120 respondents were drawn using the (Cochran, 1963) formula (n= N/(1+N e2)). The study used questionnaires to collect data that were analyzed using descriptive statistics and regression. Results showed that customers utilized all four electronic banking products and that they were statistically significant: ATMs (P=0.0001, CI = 0.78-1.2), agency banking (P=0.0001, CI = -1.32 -0.52), mobile banking (P = 0.004, CI = 0.16 -0.8), and online banking (P=0.0001, CI= -1.33 -0.41). The relevance of EFT in explaining NMB profitability was determined to be 0.02 and the p-value to be 0.05, thus concluding that EFT has a significant impact on NMB's profitability. There is positive correlation between e-

banking and the profitability of the banks. The use of PINs instead of signatures was recommended, with expectation that it is easier to manage cybercrime occurrences when PINS are used.

Onwuchekwa, Fawe and Benwari (2023), in their study investigated the effect of e-payments on the financial performance of deposit money banks in Nigeria. The ex-post facto research design was utilized to investigate the relationship between e-payments and the financial performance of deposit money banks in Nigeria for the period 2012 to 2021. Secondary data used were extracted from the Central Bank of Nigeria (CBN) Statistical Bulletin while the population of the study constituted the twenty-one deposit money banks listed in the Nigeria Stock Exchange as at 31st December 2022. The data variables used were return on asset (ROA) as proxy for financial performance while (POS, ATM and internet banking) as proxy for e-payments. Three hypotheses were stated and tested using the Ordinary Least Square Regression Model (OLS) through the use of E-views version 10.0. The results showed that while, POS and Internet banking established a significant and positive relationship with Return on Asset, ATM recorded a significant but negative relationship with ROA. We recommended that Automated Teller Machine be located in areas where it can be easily assessable to the users, more security features be added to Point of Sale(POS) machine to enable it track timely and accurately transactions. The internet banking should have strong encryptions and multifactor authentication to curb the menace of internet hackers.

Tegenu (2020), in his study describes Electronic banking as the use of electronic and telecommunication networks to deliver a wide range of value-added products and services to the bank customers. The main objective of this study was to examine the effect of electronic banking (as measured by POS, ATM, & Mobile Banking) on financial performance of selected commercial banks in Ethiopia. The specific objective is to measure the impact of electronic banking performance on ROA and ROE. The targeted population of the study was 8 commercial banks in Ethiopia. The study employed quantitative research design using secondary data extracted from annual reports of banks and their respective websites. Both descriptive and inferential statistics, such as Pearson correlation analysis, linear regression model & panel data were used to analyze the data. The study found that there was positive association between the value of ATM and POS terminal transaction with return on equity (ROE). While the association

between value of mobile bank transaction and return on equity (ROE) is found insignificant. With regard to ROA, the study found that value of ATM transaction has negative and significant linear relationship. The significance test of the models shows an overall explanatory power of the regression as 74.2 and 58.8 percent of variation in the ROE & ROA respectively, indicating that the combined effect of the e-banking services in this research is statistically significant in explaining the performance of commercial banks in Ethiopia. However, the statistical significance is different for each e-banking component and coefficients of the control variables tested and therefore if banks are to have meaning contribution to ROE & ROA, they should espouse to the multifaceted forms of e-banking services. Based on this summary of findings, the following main conclusions are drawn from the study. Except Mobile Banking, most of e-banking services (POS & ATM banking) have positive and significant relationship on performance to the ROE, whereas value of ATM has negative and significant relationship. However, the relationship between values of Mobile & POS have found in significant on ROA. This implies, an increase in all these e-banking services/products have very weak performance impact in terms of their contribution to the profit (except POS) and the investment made to them as measured by ROA of selected commercial banks in Ethiopia. Hence, the study recommends that banks should maintain and give due attention to promote and increase the use of POS product that has positive performance to their profitability, while giving special emphasis to improve on the sluggish performance of mobile banking, so as to enhance their contribution to the ROE. On the other hand, banks should strive their best so as to maintain a balance between the investment on all their e-banking service/products and the return on asset (ROA), so as to make the investment made on these products worthy enough. Moreover, they need to measure the impacts of e-banking service/products to their financial performance & strive to deter the bearings before pursuing on adopting the technologies that are both negative and weak in terms of their profitability and investment contribution.

Okonkwo and Ekwueme (2022), in their study investigate the effect of electronic payment on the financial performance of deposit money banks in Nigeria. Ex post facto research design was adopted for the study. A sample size of 13 deposit money banks in Nigeria was used from the population of 22 banks. Data were collected from CBN Statistical bulletin and annual reports and accounts of the sampled banks for the periods from 2009 to 2019. Descriptive statistics and the hypotheses regression analysis were used to analyze the data with the aid of E-Views 9.0

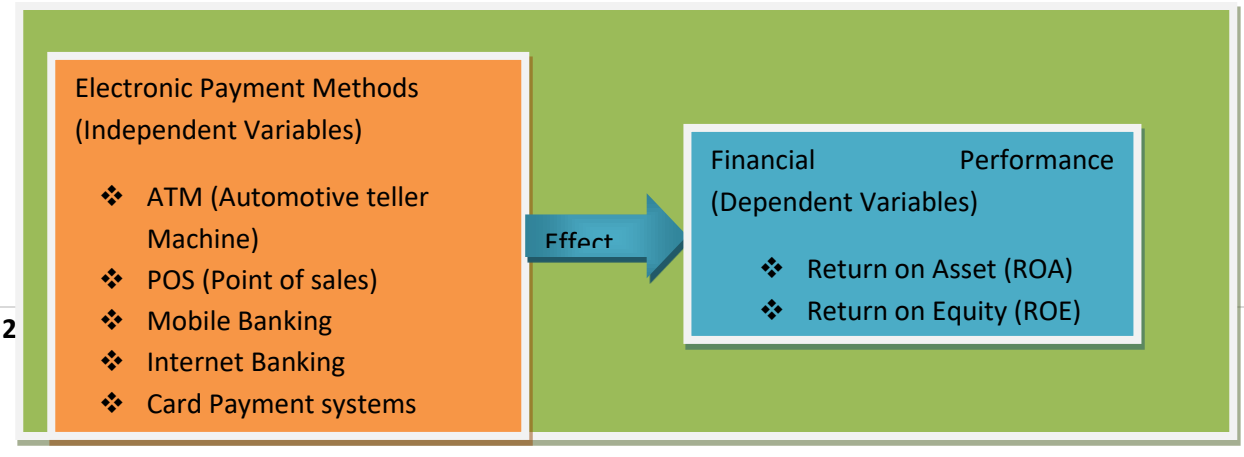
statistical software. The result revealed that ATM payment method has a positive effect on return on assets of quoted deposit money banks in Nigeria, but not statistically significant at 5% level of significance. While POS payment method has a negative effect on return on assets of quoted deposit money banks in Nigeria, and this effect was not statistically significant at 5% level of significance. The study concluded that Nigerian banks should raise knowledge about ATM usage through media campaigns, seminars, and symposia, among other things. This is despite the fact that growing use of the ATM payment mechanism boosts bank profitability in Nigeria.

In conclusion, the theoretical and empirical review indicate most of the researchers include ATM, POS, Cards, Mobile, Tele-banking, TV-banking, Internet banking and other electronic payment systems to assess their effect on the financial performance of the commercial banks. However, the researcher will select the five electronic payment systems; ATM, POS, Cards, Mobile and Internet banking to investigate their effects on the financial performance of Wegagen bank SC.

## 2.5. Conceptual Framework of the study

In the banking business, there is undoubtedly a lot of research interest on the connection between digital banking and banks' financial success. This relationship is supported in part by a number of theories and research findings. In reference to the above reviewed empirical findings, considerable amount of previous studies are supporting the availability of significant and positive relationship between the two.

By considering those empirical studies, this study identified and adopted the following independent variables: **Internet banking**, **mobile banking**, **ATM**, Cards and **POS** as independent variables with the existing digital banking channels in Wegagen bank and in relation to the profitability metrics, return on equity (**ROE**) and return on asset (**ROA)** are considered as dependent variables.



**Error! Use the Home tab to apply 0 to the text that you want to appear here.**-1: Conceptual Framework

*M***obile banking** *refers to the volume of transactions recorded in the Amole mobile banking;* ***POS*** *refers to the volume of transactions recorded in the POS;* ***ATM*** *refers to the volume of transactions recorded in the ATM; Internet banking refers to the volume of transactions made by Internet banking systems and Card refers to the volume transactions made by card of the bank.*

**Source**: Adopted from Barasa (2021), Damtew (2016), Muhammednur (2019), Hossain (2021), Muze (2019), Ndhine *et al.* (2020), Savanhu and Zhang (2020).

# Chapter-III: Research Methodology

## 3.1. Research Design and Approach

Most researchers commonly employed mixed research approach by employing questionnaire survey, interview and review of panel data from secondary resources. The authors argued that adoption of a hybrid strategy makes sense when you want to collect data that a single method would not be able to, in reference to Creswell (2014). The study also emphasizes that foundation of this method serves to counterbalance the drawbacks of using a single method in relation to the qualitative and quantitative aspects of the research issues. Therefore, with this outlook, in order to achieve the stated study objectives and respond to the research questions, this study adopted a mixed method of research: quantitative and qualitative approach. Besides, both descriptive and explanatory techniques were employed.

## 3.2. Types and Sources of Data Collection

Most researchers commonly have been collected data from primary as well as secondary sources in order to collect adequate and trustworthy data that represents the entire branch of the chosen Wegagen bank. Similarly, this study employed both primary and secondary data collection techniques.

Using questionnaire, primary data was gathered from the digital banking managers and bank lower level staffs. The questionnaire was ~~featured~~ contained both closed-ended and open-ended questions, providing the participants with sufficient opportunity to articulate their opinions. The higher official of the selected bank's digital banking managers have been also interviewed in a semi-structured manner. Besides, secondary data, panel data in particular, was collected for a period of seven years (2018 to 2024) from the bank's financial statements.

## 3.3. Target Population, Sample Size and Sampling Design

This study's population includes digital banking managers and lower level users' staff of the Wegagen bank residing in Mekelle city, Ethiopia. As per the bank's website, as of March 2024, it runs its business through a network of more than 500 locations in all Ethiopian regions. From these, more than 35 branches are located in Mekelle city. Due to financial and time constraints

as well as external factors, the study focused on branches located at Tigray region. Based on the pilot survey conducted with the digital banking staff of Wegagen bank and its Annual reports from 2018 to 2024, the population of the study was 10 digital banking managers and 85 staff digital banking users. Since the study considered respondents who have experience in managing, operating and usage of digital banking products, so that, non-probability purposive sampling was employed for selecting the respondents (managers and staff) for the semi-structured questionnaire and interview in order to investigate the influence of digital banking on financial performance of ~~commercial~~ Wegagen bank. This approach is supported by Muze (2019) and Yosef (2017) as it enables the study to generate meaningful insights that help to gain a deeper understanding of the research phenomena by selecting the most informative and effective participants that is satisfactory to its specific needs in reference to Bhattacherjee (2012). Accordingly, a total of 71 respondents with 5 digital banking managers, 66 staffs who frequently used the banking products were selected for semi-structured interview and questionnaire respectively.

## 3.4. Method of Data Analysis

This study employed descriptive statistics for analyzing the primary data collected through questionnaire and interview, and correlation analysis and multivariate regression analysis (OLS technique) for analyzing the panel data obtained for a period of seven years covering from 2018 to 2024.

## 3.5. Model Specification

Models are specified in order to examine how Abyssinia Bank's e-banking products influence its financial performances. In order to determine the statistical significant impact of the different independent variables (Internet banking, AM/I, ATM, Apollo and POS) on the dependent variables (ROA & ROE), the study employed multivariate linear regression analysis. The process of deciding which independent variables to include or leave out of a regression equation is known as model specification (Muze, 2019). Broadly speaking, theoretical rather than empirical or methodological factors should be the primary basis for specifying a regression model. In contrast to simple linear regression, which models a single dependent variable based on one or more independent variable, multivariate regression deals with scenarios where a study

considers one or more independent variables affecting more than one dependent variables.

Regression analysis's first and most important step is model specification, which is followed by parameter estimates and interpretation. With this viewpoint, the researchers determined that accurate model specification is necessary for both the estimation of a model's parameters and their interpretations. Consistent with Mensi *et al*. (2014), the general panel data regression model will be employed by this study is formulated as follows:

$$Y_i = \beta_{0i} + \beta_{1i} X_{1i} + \beta_{2i} X_{2i} + \beta_{3i} X_{3i} + \beta_{4i} X_{4i} + \varepsilon_i$$

Where i = 1, 2, 3 represents the equation for ROE and ROA ($Y_1$ $Y_2$) respectively. $\beta_0$_i: Intercept term for each equation. $\beta_1$i – $\beta_5$_i: Coefficients for each independent variable ($X_1$ - $X_5$) in each equation. $\varepsilon_i$: Error term for each observation.

Moreover, the breakdown of separate multivariate regression models for each financial performance metric (ROE, ROA) to analyze the link with e-banking services (POS, ATM, Mobile Banking, Internet and Apollo) are presented as follows:

**Model 1**: Return on Equity (ROE) - $Y_1$, Equation:

$$Y_1 (ROE) = \beta_{01} + \beta_{11} X_1 + \beta_{21} X_2 + \beta_{31} X_3 + \beta_{41} X_4 + \beta_{51} X_5 + \varepsilon_1$$

Where $\beta_{01}$: Intercept term, $\beta_{11}$ - $\beta_{41}$: Coefficients for POS transactions ($X_1$), ATM transactions ($X_2$), Mobile Banking activity ($X_3$), Internet Banking ($X_4$), Card transactions ($X_5$) respectively, and $\varepsilon_1$: Error term.

**Model 2**: Return on Assets (ROA) - $Y_2$, Equation:

$$Y_2 (ROA) = \beta_{02} + \beta_{12} X_1 + \beta_{22} X_2 + \beta_{32} X_3 + \beta_{42} X_4 + \beta_{52} X_5 + \varepsilon_2$$

Where $\beta_{02}$: Intercept term, $\beta_{12}$ - $\beta_{52}$: Coefficients for each predictor variable ($X_1$ - $X_5$), and $\varepsilon_2$: Error term.

## 3.6. Ethical Consideration

The researcher proceeded with data collection after obtaining authorizations from Mekelle University and Wegagen bank from which data was collected. The researcher ensured that participants completely understand the purpose and methods to be used in the study. The participants will make to understand that they have the right to withdraw from the study at any time. A consent form was availed to the participants to sign whether to participate in the study or

not. An assurance for all the information was provided by the respondents' to treat with utmost confidentially.

# Chapter-Four: Results and Discussion

## Introduction

*This chapter presents the results of the statistical tools used in the study. It analyzes the effect of digital banking on financial performance of the Wegagen bank using the annual balanced panel data, where all the variables are observed for each cross-section and each time period. The study used a panel data for a period of time spanning from the year 2018 up to 2024 in the Wegagen bank. It has four sections: Section one deal with descriptive analysis of the variables involved in the study; section two discusses the correlation analysis of the dependent and independent variables and section three deals with the multivariate regression analysis of the study. Finally, section four presents the responses from the staff and higher digital banking officials.*

## 4.1. Descriptive Analysis

Descriptive statistics refers to the analysis of data that helps to describe, summarize data in a meaningful way. These analysis methods are very important because they would be hard to visualize what the data was showing, if simply presented the data. Hence, this enables to present the data in a more meaningful way, which makes simpler for the interpretation of the data.

**Table 4-1: Summary for Descriptive results**

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| **ROA** | 0.017 | 0.010 | 0 | 0.03 |
| **ROE** | 0.237 | 0.125 | 0.03 | 0.44 |
| **Log ATM** | 6.400 | 0.081 | 6.31 | 6.54 |
| **Log POS** | 4.097 | 0.669 | 3.31 | 5.03 |
| **Log Cards** | 4.340 | 0.329 | 3.91 | 4.74 |
| **Log Mobile** | 5.234 | 0.720 | 4.14 | 6.2 |
| **Log Internet** | 4.269 | 0.435 | 3.44 | 4.71 |

The descriptive statistics for the Wegagen Bank from the year 2018 to 2024, with each variables of the study, have been discussed here under. The dependent variables used in this study in order to measure Wegagen bank's financial performance are Return on Asset (ROA) and Return

on Equity (ROE); while, the explanatory variables are volume of ATM, POS, Mobile, Internet and Cards. Accordingly, the summary statistics for all variables presented above in **Table 4.1** includes mean, maximum, minimum, standard deviation and number of observations of both of the dependent and independent variables of the study. The mean provides an average value, indicating where most values likely center; whereas, the standard deviation measures how concentrated the data are around the mean; the more concentrated, the smaller the standard deviation (Creswell, 2003; 2014). He also further described the higher the value of standard deviation implies greater spread of data, the smaller the standard deviation shows the data is concentrated around the mean. This means that on average, a small standard deviation indicates that the values in the statistical data set are close to the mean of the data set, on average, and a large standard deviation indicates that the values in the data set are further away from the mean.

Based on the descriptive results indicated above, the dependent variables: ROA and ROE have average score of 0.017 and 0.237 respectively with respective standard deviation of 0.010 and 0.125. This implies that on averages 1.71% of operating incomes are operating expenses and 23.7% of total assets are net income after tax. On the other hand, the independent variables: LogATM($X_1$), Log POS ($X_2$), LogCards ($X_3$), LogMobile ($X_4$) and Log Internet ($X_5$) have mean score of 6.400, 4.097, 4.340, 5.234 and 4.269 respectively with respective standard deviations of 0.081, 0.669, 0.329, 0.720 and 0.435. The standard deviations are lower, indicating the values in the statistical data set are close to the means of the data set for each electronic payment systems.

The interview responses of digital banking managers and lower level employees' states that electronic payment systems like ATM, POS, Cards, Mobile and Internet banking have significantly reduced paperwork and manual processing, improved transaction speed, and widened financial inclusion. However, it also introduced new challenges such as managing cyber security risks, system downtime, and increased customer expectations for 24/7 service, bank diversified digital payment system and how can it related to the electronic payments system in creating awareness on the digital and global trends to the society by creating alternative payment channels.

According to the interviewees, the bank oversees the operations and performance of digital banking services such as mobile banking, and e-wallet services. Such role

includes introducing new digital initiatives and use cases as well as ensuring smooth operations, monitoring financial outcomes, and aligning digital products with customer needs.

## 4.2. Correlation Analysis

Correlation refers to an index of the strength of the relationship between two variables. The standard Pearson's correlation describes the linear relationship between two variables. A linear relationship is one where an increase in one variable is associated with an increase or decrease in another variable. Rules of thumb (Cohen, 1988) states that the correlation coefficient (r) of small (low) effect: 0.10 < r < 0.30, medium (moderate) effect: 0.30 < r < 0.50 and large (strong) effect: r >0.50.

Error! Use the Home tab to apply 0 to the text that you want to appear here.**-2: Correction analysis of ROA model**

```
. pwcorr ROA LogATM LogPOS LogCards LogMobile LogInternet

             |      ROA   LogATM   LogPOS LogCards LogMob~e LogInt~t
-------------+------------------------------------------------------
         ROA |   1.0000
      LogATM |  -0.1457   1.0000
      LogPOS |  -0.1438  -0.1645   1.0000
    LogCards |  -0.1453   0.0149  -0.1640   1.0000
   LogMobile |  -0.1444  -0.1651  -0.1629  -0.1646   1.0000
 LogInternet |  -0.1449  -0.0102  -0.1636  -0.1652   0.0017   1.0000
```

The correlation analysis results in **Table 4.2** indicated the correlation results of ROA (Return on Assets) with ATM (-0.1457), Cards (-0.1453), POS(-0.1438), Internet (-0.1449) and Mobile (-0.1444). This implies that ROA has negative and low relationship with ATM, POS, Cards, Internet and Mobile banking. It means that ATM transaction has the highest negative effect on ROA followed by similar effect of Cards, Internet, Mobile and POS banking transactions on the assets of the bank. The negative sign of LogATM, LogPOS, LogCards, LogMobile and LogInternet are due to the fact that usage of ATM machine in Ethiopia commercial banking industry like Wegagen bank incurred large amount of huge adoption, installation and maintenance cost which is much greater that the generates service charge. This large cost reduces

the return on asset of the bank. Similarly, the negative effects of LogPOS, LogCards, LogInternet and LogMobile will reduce the return on asset of the bank due to huge investment costs to adopt these services, install the applications and incurred mach lower charges because of lesser usage by the customers.

### Table 4 -3: Correlation Analysis for the Model-ROE

```
. pwcorr ROE LogATM LogPOS LogCards LogMobile LogInternet

             |      ROE   LogATM   LogPOS LogCards LogMob~e LogInt~t
-------------+------------------------------------------------------
         ROE |   1.0000
      LogATM |  -0.1475   1.0000
      LogPOS |  -0.1455  -0.1645   1.0000
    LogCards |  -0.1470   0.0149  -0.1640   1.0000
   LogMobile |  -0.1461  -0.1651  -0.1629  -0.1646   1.0000
LogInternet |  -0.1467  -0.0102  -0.1636  -0.1652   0.0017   1.0000
```

The correlation analysis results in **Table 4.3** indicated the correlation results of Return on Equity (ROE) with ATM (-0.1475), Cards (-0.2241), Internet (-0.1467), Mobile (-0.1461) and POS (-0.1455). This implies that ROE has negative and low relationship with POS, Cards, Internet, ATM and Mobile banking. It means that ATM transaction has the highest negative contribution for ROE followed by similar negative contribution of Cards, Internet, Mobile and POS banking transactions on the shareholders' equity of the Wegagen bank. This means that the electronic payment systems like ATM, POS, Cards, Mobile and Internet banking have negative relationship with the return on Equity of the bank. This is due to the cost incurred for ATM, Mobile, POS, Internet and cards installation, maintenance, system development and others are much larger than the collected charges from these services.

The interview response from digital managers also states that the electronic payment has its own impact in reducing operational costs. If customer visits branch to withdraw money this single transaction have cost (branch rent, employee, and others costs). If that customer uses ATM to withdraw the money, the cost is very low comparing with the branch.

## 4.3. Regression Analysis

Multivariate regression analysis allows multiple variables to be examined simultaneously in order to combat spurious relationships. The most widely used method of regression analysis is Ordinary Least Squares (OLS) analysis (Meyers *et al*., 2006). OLS works by creating a best fit trend line through all of the available data points. The OLS method is used to come up with the econometric results. The model specified follows a log relationship, in order to show the elasticity of the dependent with respect to the explanatory variables. Hence, the study used OLS methods to find the estimation values of the parameters in the specified models.

### Table 4-4: Regression Analysis for the Model -ROA

```
.egress ROA LogATM LogPOS LogCards LogMobile LogInternet, level(90)

      Source |       SS       df       MS              Number of obs =      49
-------------+------------------------------           F(  5,    43) =    2.12
       Model |  .000455544     5  .000091109           Prob > F      =  0.0816
    Residual |  .001850578    43  .000043037           R-squared     =  0.1975
-------------+------------------------------           Adj R-squared =  0.1042
       Total |  .002306122    48  .000048044           Root MSE      =  .00656

------------------------------------------------------------------------------
         ROA |      Coef.   Std. Err.      t    P>|t|     [90% Conf. Interval]
-------------+----------------------------------------------------------------
      LogATM |  -.0007425    .000434    -1.71   0.094    -.0014721   -.0000129
      LogPOS |  -.0014902   .0006968    -2.14   0.038    -.0026617   -.0003188
    LogCards |  -.0012708    .000656    -1.94   0.059    -.0023736   -.0001679
   LogMobile |  -.0010412   .0005351    -1.95   0.058    -.0019408   -.0001417
  LogInternet |  -.0011279   .0006532    -1.73   0.091    -.0022259   -.0000299
        _cons |   .0062452   .0014966     4.17   0.000     .0037293    .008761
------------------------------------------------------------------------------
```

The regression model used in the study (**Table 4.4)** had an adjusted $R^2$ = 0.1042 (i.e., 10.42% **of the variation in ROA is explained** by the predictors) and standard error of 0.00708 which refers to the mean deviation of ROA predicted resultant regression model at 90% confidence interval level. The electronic payment systems; ATM, POS, **Cards, Internet** and **Mobile** account for 10.42% variance of ROA; whereas, the remaining 89.58% explained by other extraneous variables, may be like other non-digital banking service products. The findings show that the variable had a significant goodness of fit between variable as F- calculate is 2.12.

Similarly, the regression analysis (**Table 4.4**) shows that a unit increase in POS significantly (α = 0.038) decrease ROA by 0.0014902, a unit increase in Mobile banking significantly (α = 0.058) decrease ROA by 0.0010412, a unit increase in ATM banking significantly (α = 0.094) decreases the ROA by 0.0007425, a unit increase in Cards significantly (α = 0.059) decrease the return on asset (ROA) by 0.0012705 and a unit increase in Internet banking significantly (α = 0.091), assuming other factors in each relationship analysis stay constant at 10% significance level. The negative effect of ATM on ROA is due to the fact that usage of ATM in Ethiopia commercial banking industry like Wegagen bank doesn't generate any service charge to the bank rather than its huge adoption, machine installation and maintenance cost. This means that the large costs of ATM machine, adoption and maintenance costs reduces the return on asset of the bank. Similarly, the negative effect of the electronic payment systems like Cards, POS, Internet and Mobile banking generates much lower charges/revenue than their installation, maintenance and adoption costs. On the other hand, all the electronic payment systems have statistically significant effect on ROA of the bank. In contrast to this finding; study by (Muhammednur, 2019) found that only ATM has significant effect on the financial performance in terms of ROA. Another finding by ( ) shows that

However, the interviewees (Digital banking Managers) also depicts although digital banking has positively contributed to RoA by increasing transaction volumes, fee-based income, and reducing branch operation costs, the high investment cost in IT infrastructure and system maintenance sometimes lowers the short-term return, especially in recent years. Digital banking enables banks to operate more efficiently by automating processes, reducing the need for physical infrastructure, and minimizing operational costs. This efficiency allows banks to serve a larger number of customers efficiently with minimum resources, thereby increasing their profitability. The improved cost structure directly and positively influences the ROA in the future, which measures how efficiently and effectively a bank utilizes its assets to generate profits.

### Error! Use the Home tab to apply 0 to the text that you want to appear here.-5: Regression Analysis for the Model-ROE

```
.egress ROE LogATM LogPOS LogCards LogMobile LogInternet, level(90)
```

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| Model | .087173503 | 5 | .017434701 | Number of obs = | 49 |
| Residual | .343789753 | 43 | .007995111 | F( 5, 43) = | 2.18 |
| | | | | Prob > F = | 0.0739 |
| Total | .430963256 | 48 | .008978401 | R-squared = | 0.2023 |
| | | | | Adj R-squared = | 0.1095 |
| | | | | Root MSE = | .08942 |

| ROE | Coef. | Std. Err. | t | P>\|t\| | [90% Conf. | Interval] |
|---|---|---|---|---|---|---|
| LogATM | -.010271 | .0059155 | -1.74 | 0.090 | -.0202154 | -.0003267 |
| LogPOS | -.0206146 | .009498 | -2.17 | 0.036 | -.0365814 | -.0046479 |
| LogCards | -.017579 | .0089419 | -1.97 | 0.056 | -.032611 | -.0025471 |
| LogMobile | -.0144039 | .0072936 | -1.97 | 0.055 | -.026665 | -.0021428 |
| LogInternet | -.0156023 | .0089025 | -1.75 | 0.087 | -.030568 | -.0006365 |
| _cons | .0863917 | .0203983 | 4.24 | 0.000 | .0521007 | .1206827 |

The regression model used in the study (**Table 4.5)** had an adjusted $R^2$ = 0.1095 (i.e., 10.95% of the variation in ROE is explained by the predictors) and standard error of 0.08942 which refers to the mean deviation of ROE predicted resultant regression model at 90% confidence interval level. ATM, POS, Cards, Internet and Mobile account for 10.95% variance of ROE; whereas, the remaining 89.05% explained by other extraneous variables, may be like electronic money, E-utility, E-school and other forms of bank products. The findings show that the variable had a significant goodness of fit between variable as F- calculate is 2.18.

The regression analysis (**Table 4.5**) shows that a unit increase in Cards will significantly (α = 0.056) decrease ROE by 0.017579, a unit increase in POS will significantly (α = 0.036) decrease ROE by 0.0206146, a unit increase in internet banking will significantly (α = 0.087) decrease in ROE by 0.0156023, a unit increase in Mobile significantly (α = 0.055) decrease ROE by 0.0144039 and a unit increase in ATM banking will significantly (α = 0.090) decrease the ROE by 0.010271, assuming other factors in each case remain constant at 10% significance level. This implies that Cards, ATM, POS, Mobile and Internet transactions have significant effect on the performance of the bank in terms of ROE. The negative effects of ATM and POS, Cards, Mobile and Internet transactions are due to the service charges generated from these services much were lower than their installation, adoption and maintenance costs. This means that the huge costs

incurred for these services reduces the profitability of the bank, which leads to decrease the return on Equity of the bank.

The interviewees' (Digital Banking Managers and lower level officers) response indicate digital banking affected the financial performance in relation with ROA and ROE on cost minimization on the risk and expense through the organization the word by smart work by enhancing operational efficiency by reducing costs associated with physical branches, staff, and manual processes. This improves the bank's profitability, allowing for higher returns on equity. Moreover, digital banking provides opportunities for revenue growth through fee-based services, faster loan processing, and personalized financial products, which enhance income generation and return on Equity. The convenience and accessibility of digital platforms also attract and retain more customers, leading to higher deposits and lending volumes. Though initial investments in technology and cyber security can be significant, the long-term profitability gains typically boost ROE, as the bank can generate more income.

### 4.4. Summary of the responses from the lower and higher level employees

The response from the lower level employees indicates that most respondents have 2-5 years of experience in banking, specifically with electronic payment products, frequently assist customers to resolve the difficulties with digital banking services, agreed with operational changes (e.g., reduced paperwork, faster service) since the adoption of digital banking, believed that electronic payment systems have led to greater increase in Wegagen Bank's return on Asset and Equity and increasing this digital banking payment systems has led to greater cost efficiency in Wegagen Bank's daily operations, highly influenced the adoption of digital bank's staffing requirements, received positive feedback from customers about electronic payment services and then such practices brings high customer satisfaction since the introduction of electronic payment systems. This is due to most officer obtained adequate training to support electronic payment services.

Similarly, the response from the digital banking managers' shows that automation of the services will be reduced many teller-based tasks thereby significantly improving efficiency and effectively, received positive feedback from customers on electronic payment systems. This obtained and gage adequate training and development of the electronic system service products like ATM, POS, Cards, Mobile and Internet banking.

# Chapter-Five: Conclusion and Recommendations

## Introduction

*This chapter consists of four sections. The first section deals with the conclusions drawn from the findings. The second section presents the recommendations from the major findings of the study. The third section discusses the implications for the management of the bank and policy developers. The last section deals with the suggestions for future works of the study.*

## 5.1. Conclusions

This study was conducted to examine the effect of electronic payment systems on financial performance of the Wegagen bank in Ethiopia. It presents conclusions based on the discussions on the research findings regarding the effects of electronic payment systems on financial performance of the Wegagen bank attributed to the ROA and ROE as dependent variables and the volume of transactions made by the electronic payment services; namely, ATM, POS, Cards, Internet and Mobile banking as independent variables to depict electronic payment service deliveries for customers to enhance its financial performance.

Firstly, some findings revealed that ATM usage is essential and has contributed positively to the financial performance of the commercial banking industry in Ethiopia in terms of increasing ROA and ROE. However, the study concludes that usage of ATM had negative and significant influence on the financial performance of the Wegagen bank in terms of ROA and ROE. This negative effect implies that the costs incurred for ATM machine, maintenance, adoption and installations are much larger than the service charges collected from the services, which increases the operating costs and reduced the profitability of the bank. This reduction in profitability of the bank leads to reduce the return on asset and equity of the bank.

Secondly, the study concludes that usage of POS banking had a significant negative influence on both the ROA and ROE of the Wegagen bank. The negative effect on ROA and ROE implies that the service charges obtained from POS are much less than its costs of maintenance, adoption and the machines when they install in certain areas to provide services. This increases the operating costs of the bank and reduces the profitability, in return reduces the return on asset and equity of the bank.

Thirdly, the study concluded that the volume of transactions by Cards has negative and

significant effect on the financial performance of the Wegagen bank's ROA and ROE. This means the negative result on the volume of transactions made by different types of cards has less contribution on betterments of the ROA and ROE of the bank. This implies that the cost incurred to install the card preparation and other maintenance is much higher than the charges and fees collected from the sale of cards and related service deliveries.

Fourthly, the study revealed that the volume of transactions by Mobile banking has negative and significant effect on ROA and ROE of the bank. This implies that the volume of transactions made by mobile banking has significant but less contribution on enhancing return on asset and equity of the bank. This is due the cost incurred for mobile banking system development, maintenance and improvement is much higher than the charges and fees collected from the services.

Finally, the study concluded that the volume of transactions made by Internet banking have negative and significant effect on the return on Asset and Equity of the bank. This implies that the electronic payments made by internet banking have less on contribution on the financial performance of the bank in terms of return on Asset and Equity of the bank.

Moreover, the study had concluded the bank has encountered several challenges in implementing electronic system; including cyber security threats, customer education and adoption, high implementation costs, regulatory compliance, legacy system integration like legal stem, inclusive and interoperable infrastructure, regulatory and oversight issues, customer and employee's awareness in technology updated, high competition, lack of skilled manpower and infrastructure.

In conclusion, the study found that the adoption of electronic payment systems has negative and significant effect on ROA and ROE of the Wegagen bank. In other words, the development of electronic payment systems like ATM, POS, Card Payments, Internet and Mobile banking has less contribution on enhancing the return on asset (10.42%) and equity (!0.95%) of the bank.

## 5.2. Recommendations

The study forwards the following possible recommendations for the management of the Wegagen bank; other banks in similar occupation and policy makers and academicians' based on

the study's findings and conclusions. The recommendations are supposed to enhance the positive effects of electronic payment tools (ATM, POS, Card, Internet and Mobile banking) on the Wegagen bank's financial performance in terms of ROA and ROE, and reduce the challenges of adopting such systems.

The usage of ATM had significant negative effects on enhancing return on equity and asset of the bank due to the outdated ATM installed by the Wegagen bank, which does not enhance clients' use of ATM, for example the outdated ATM doesn't enable bank customers to make 24/7 deposit. This inefficiency of ATM will reduce the return on equity and assets. Similarly, the cost to buy and update is much larger than the services charges, which enhance the operating costs and reduce the return on equity and asset. Hence, the bank should adopt latest or update ATM and increase service charges to deliver comprehensive service in all areas in order to attain operating cost efficiency and improve the bank's financial performance in terms of ROA and ROE. This implies that the bank should update the Machine (ATM) to latest version that can expect more secure features driven by artificial intelligence (AI), which detect suspicious activities around the ATM and improve each machine's responsiveness to fraud and break in attempts, permit international withdrawals, permit off-site ATM withdrawals, increase the service categories such as able to self-deposit, create awareness to users on the importance's of using ATM, increase the ability to pay card-less customers, the daily cash withdrawal limits and the number of ATM in different areas.

The POS banking had significant negative effect on ROA and ROE of banks. Hence, the bank needs much effort to maintain the growing trends in the usage of POS banking by installing POS machine around various merchandise outlets like supermarkets, hotels and petrol stations, to increase wider usage of POS banking and increase the service charges and fees in order to increase the financial performance and attract and retain high value customers and traders of the bank. This POS transactions can be increased by initiating the users, preparing rewards for the users, create awareness to community on the purpose of using POS repeatedly, increase the service charges based the new improvement, update the POS machines and install POS machines in different areas of businesses. This would improve and enhance the return on asset and return on equity of the bank.

The study revealed that the volume of transactions made by Cards has less contribution on enhancing return on Asset (ROA) and ROE of the bank. Hence, the bank needs much effort to increase the volume of transactions by cards in order to obtain better service charges and increase the profitability of the bank in terms of ROA and ROE. In this case, the bank should increase the bank's card transactions by creating initiation and awareness to the customers, increase the service charges and fees, updating the quality of cards and its service year, increase the number of card users by giving rewards, increase the amount of daily transactions through cards, motivate customers to make their transactions by cards and update the latest improvement futures the cards as well as the transactions made by them as easy as customers' need.

The study found that mobile banking had negative significant effect on the ROA and ROE of the bank because of its development is in its infant stage and facing security and technical challenges. Therefore, the bank should strive to do great in creating awareness on the advantage of using mobile banking than traditional banking system in order to increase customer satisfaction, which in return improves its financial performance. Moreover, the bank needs much effort to customize its mobile banking service in every mobile device by creating sound partnership with the telecommunication firms in order to achieve synergy in attaining financial inclusion, enhance the income from the service and accelerating the adoption of mobile banking for enhanced financial performance.

The study also found that the electronic payment systems by Internet banking had negative significant effect on the performance of ROA and ROE due to the cost of maintenance, system installation and other related costs are much larger the income collected from the service. Hence, the bank should increase the initiation and awareness to users, update the application in order to operate by all users easily, provide fast and reliable technical support to users and increase the service charges collected from each transactions to improve the financial performance of the bank.

Finally, based on common trends and best practices in the electronic payments banking industry, Wegagen bank could consider; enhance user experience (UX) and interface design, expand financial literacy and digital education, strengthen security with biometrics and multi-factor authentication (MFA), focus on financial inclusion through USSD, introduce stronger cyber security and fraud detection systems, improve interoperability with other banks and fin-tech, use

wider merchant acceptance for POS and mobile money, introduce advanced personal financial management (PFM), tools like seamless digital wallet and payments integration, apply Artificial Intelligence (AI) for enhanced customer support, develop investment and wealth management platforms, expand digital lending services, enhance cross-border payment and remittance services, promote sustainable banking practices, introduce loyalty programs and rewards, and finally, continuous feedback loop for product improvement. Besides, the regulatory authorities, National Bank of Ethiopia (NBE), should review the policies, procedures and directives to come up with relevant policies to foster financial inclusion within the banking industry in order for the industry to achieve maximum returns, and promote utilization of electronic payment channels in the bank. Sectors and governmental organizations should also highly support and give attention to the digital payment system and creating strong awareness to the whole society.

## 5.3. Managerial and Policy Implications

### 5.3.1. Managerial Implications

The bank could improve the overall efficiency, security, and convenience of its electronic payment services, attracting more users and deepening customer loyalty. To improve the adoption of electronic payment systems, the managements should adopt; 1) seamless User Experience (UX) plat forms like Unified Access: Provide a single platform (or app) that integrates all services—savings, loans, investments, and customer support—so users don't need to toggle between multiple apps or interfaces. 2) Simplified Registration: improve the on boarding process for new users with fewer steps, ensuring a smooth start. 3) Utilizing E-KYC (electronic Know Your Customer) could help streamline this process further. 4) Personalized recommendations: based on user activity, suggest relevant banking services, such as suitable savings accounts, credit cards, or loans, offering a more personalized touch. 5. Innovative Features like Digital Wallet Integration that offer a digital wallet feature that allows me to store money, pay bills, and conduct peer-to-peer (P2P) transfers quickly. Integration with local payment systems would also be helpful. 6. Multi-currency Accounts: provide accounts that support different currencies, especially for international transactions, making it easier to send or receive money globally without currency conversion hassles. 7. Goal-Based Savings: Introduce a goal-setting savings feature where the user can set financial targets and track progress towards these goals. 8. Enhanced Security Measures: advanced authentication: implement stronger

security measures, such as biometric authentication (fingerprint, facial recognition) and two-factor authentication and Working with updated technology.

Moreover, the management could consider introducing and developing more electronic payment services in its policies such as mobile wallets:, online lending platforms, automated savings tools, investment platforms, personal finance management tools like improved digital wallet and contactless payments, enhanced automated lending platforms, more advanced virtual banking, buy now and pay later product/service offerings like Dube Ale and soon to improve financial metrics such as Return on Assets (RoA) and Return on Equity (RoE).

### 5.3.2. Policy Implications

To enhance the positive effect of the electronic payment systems on a bank's financial performance, the bank should develop several key strategies in its policies including investing in advanced technology, strengthening cyber security measures, improving customer experience strategic partnerships, introduce channel integration, operational efficiency, performance monitoring, loyalty and engagement programs, focus on regulatory compliance, change management and training, comprehensive customer education, user-centric design, data analytics utilization: customer education, introduce user-friendly platforms and invest in advanced technologies, expand digital product offerings.

To further improve financial metrics like Return on Assets (RoA) and Return on Equity (RoE), the bank could consider introducing additional digital banking flexible loan products and services that create arrange of customizable loan products that customers can tailor to their financial needs, including options for repayment schedules and interest rates like subscription-based banking services, introduce electronic-commerce solutions, green banking initiatives, microfinance and small business support, customer loyalty and rewards programs, online financial education and resources like personalized financial advisory services, integrated loan management systems, automated investment platforms, block chain-based transactions, digital insurance solutions, loyalty and rewards programs, digital account opening, automated cash collection services, on line loan applications, instant approvals, and payments, check deposit machines, automated service charge collections, virtual financial, application, mobile and internet banking, and access to finance/credit.

## 5.4. Suggestion for Future Works of the study

The study was selecting ATM, POS, Cards, Internet and Mobile banking transactions as independent variables and the ROA and ROE as financial performance indicators. Hence, future studies may analyses the effect of electronic payment systems on financial performance by considering additional predictor variables such as hello-cash, e-money, e-birr, virtual-baking, e-utility and e-school.

Similarly, this study focused on the effects of electronic payment systems on two financial performance indicators (i.e., ROA and ROE) to analyze the profitability of the bank. However, electronic system payment systems (ATM, POS, Cards, Internet and Mobile) can also have effect on other financial performance indicators (such as net profit margin, cost effectiveness, gross profit margin, and earnings before interest and taxes) and non-financial performances indicators (such as risk, customer experience, satisfaction, retention and loyalty). Therefore, future researches may consider these financial and non-financial indicators.

Finally, this study was conducted on Wegagen bank, which is one of the private commercial banks in Ethiopia. Thus, the results should not be generalized to other commercial banks in the country and other countries whose geographical, economic and contextual situation is different from Ethiopia. Hence, a similar and comparative study may be conducted on other private and public commercial banks.

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# Appendices

## Appendix-I: Questionnaire for digital Banking lower level officials

**Mekelle University**

**College of Business and Economics**

**Department of Accounting and Finance**

**Master of Finance and Investment (MFI) Program**

Dear respondent,

This questionnaire is designed in order to collect relevant data for investigating "**the effect of electronic payment systems on financial performance in Wegagen Bank S.Co.**" (i.e., to assess the effect of electronic payment systems on RoA and RoE) as a partial fulfillment for the completion of Master of Finance and Investment (MFI). Hence, I am kindly requesting you to fill in this questionnaire while assuring you that the information that you provide will be treated with confidentiality and shall only be used for the purpose of this academic research. I would also like to remind you that your fair and impartial data will make this research a very successful one.

Thank you for your cooperation and assistance.

**Acronyms:**

ATM = Automatic Teller Machine, POS = Point of Sale, ROA = Return on Assets and RoE = Return on Equity.

**Instruction:**

Please respond to each question by putting a tick (√) mark in the box which best reflects your perception and write your responses on the space provided.

**1. Background Information**

1.1. Sex

[ ] Male [ ] Female

1.2. Age

[ ] Below 24 [ ] 24-34 [ ] 35-45 [ ] 46-56 [ ] Above 57

1.3. What is your current role at Wegagen Bank?

[ ] Manager [ ] Other, please specify _____

1.4. Educational Level

[ ] Diploma [ ] Degree [ ] Masters [ ] Doctor (Ph.D.) [ ] Other, specify_____

1.5. How many years of experience do you have in banking, specifically with electronic payment products?

[ ] 1 year [ ] 2-5 years [ ] 6-9 years [ ] 10-13 years [ ] above 13 years

**2. Operational Impact**

2.1.How frequently do you assist customers with digital banking services on a scale of 1-5?

[ ] Very Frequently [ ] Frequently [ ] Occasionally [ ] Rarely [ ] Never

2.2.Have you observed any operational changes (e.g., reduced paperwork, faster service) since the adoption of digital banking? [ ] Yes[ ] No.

2.3. If your answer for 2.2 is yes, to what extent does it affects?

[ ] Very High [ ] High [ ] Moderate [ ] Low [ ] Very Low

**3. Impact on Return on Asset and Equity**

3.1. Do you believe that electronic payment systems have led to greater increase in Wegagen Bank's return on Asset and Equity? [ ] Yes [ ] No.

3.2. If your answer for 3.1 is no, why? Please explain._____

_____

_____

3.3. Do you believe that digital banking has led to greater cost efficiency in Wegagen Bank's daily operations? [ ] Yes [ ] No.

3.4. If your answer for 3.3 is no, why? Please explain._____

_____

_____

3.5.How has the adoption of digital banking affected the bank's staffing requirements?

[ ] Very High [ ] High [ ] Moderate [ ] Low [ ] Very Low

Why? Please explain. _____

_____

_____

**4. Customer Feedback**

4.1. What kind of feedback do you receive from customers about electronic payment services?

[ ] Very Positive [ ] Positive [ ] Neutral [ ] Negative [ ] Very Negative

4.2. Has there been an increase in customer satisfaction since the introduction of electronic payment systems? [ ] Yes [ ] No.

4.3. If your answer for 4.2 is yes, what is the extent of customer satisfaction?

[ ] Very High [ ] High [ ] Moderate [ ] Low [ ] Very Low

**5. Training and Development**

5.1. Have you received adequate training to support electronic payment services?

[ ] Yes [ ] No.

5.2. If your answer for 5.1 is no, why? Please explain. _____

_____

_____

_____

6. Comments (if any) _____

_____

_____

_____

_____

_____

_____

_____

## Appendix-II: Interview Questions for Digital banking Managers

**Mekelle University**

**College of Business and Economics**

**Department of Accounting and Finance**

**Master of Finance and Investment (MFI) Program**

Dear respondent,

This interview is designed in order to collect relevant data for investigating " **the effect of electronic payment systems on financial performance in Wegagen Bank S.Co.** (i.e., to assess the effect of electronic payment systems on RoA and RoE) as a partial fulfillment for the completion of Master of Finance and Investment (MFI). Hence, I am kindly requesting you to fill in this questionnaire while assuring you that the information that you provide will be treated with confidentiality and shall only be used for the purpose of this academic research. I would also like to remind you that your fair and impartial data will make this research a very successful one.

Thank you for your cooperation and assistance.

**Acronyms:** ATM = Automatic Teller Machine, POS = Point of Sale, ROA = Return on Assets and RoE = Return on Equity.

1. Can you describe your role at Wegagen Bank and how it relates to electronic payment systems?

2. How has the adoption of electronic payment systems services changed the way you conduct your banking activities?

3. In your opinion, how has digital banking affected the financial performance of Wegagen Bank, in relation to ROA and ROE?

4. What challenges have you encountered while implementing or using electronic payment system services?

5. What improvements or innovations would you like to see in Wegagen Bank's electronic payment services?

6. Based on your experience, what recommendations would you make to improve the electronic payment system at Wegagen Bank?