FACTORS AFFECTING CASH SUPPLY CHAIN MANAGEMENT: IN THE CASE OF COOP BANK OF OROMIA S.C

BY

ELIAS SOLOMON

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE FOR THE PARTIAL FULFILMENT OF THE DEGREE OF MASTER'S ARTS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

ADVISOR:

TARIKU JEBENA (PhD)

JUNE, 2024 G.C

ADDIS ABABA, ETHIOPIA

Declaration

I, Elias Solomon, declare that this thesis entitled Factors Affecting Cash Supply Chain Management in Banking Services, in the Case of Cooperative Bank of Oromia S.C, is my original work and has not been presented to any other university for degree requirements. All the sources used to support this particular study have been appropriately acknowledged.

Declared by Elias Solomon Signature: _____Date: _____

Statement of Certification

This is to certify that Elias Solomon has carried out this thesis on the topic entitled Factors Affecting Cash Supply Chain Management in Banking Services: In the Case of Cooperative Bank of Oromia S.C ǁ under my supervision. Accordingly, I here assure you that his work is appropriate and standard enough to be submitted for partial fulfillment of the requirements for the award of the degree of Master of Arts in Logistics and Supply Chain Management.

Tariku Jebena (PhD.)

Signature: _____ Date: _____

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

POSTGRADUATE PROGRAM

BOARD OF EXAMINERS APPROVAL SHEET

FACTORS AFFECTING CASH SUPPLY CHAIN MANAGEMENT:

IN THE CASE OF COOP BANK OF OROMIA S.C

By: ELIAS SOLOMON

Approved by the Board of Examiners:

Tariku Jebena (PHD) _____ _____

Advisor NameSignature Date

Shiferaw Mitiku (PHD) _____ _____

Internal Examiner Signature Date

Shimelis Zewudie (PHD) _____ _____

External ExaminerSignature Date

_____ _____ _____

Department Chairperson Signature Date

Acknowledgment

First and foremost, I express my deepest gratitude to the Almight for His unwavering support and guidance throughout my journey.I extend my heartfelt appreciation to my advisor, Dr. Tariku Jebena, for his invaluable guidance, constructive criticism, timely feedback, and unwavering support at every stage of this study.I would also like to acknowledge the staff and management of the Cooperative Bank of Oromia S.C. for their cooperation and assistance throughout this study.

Lastly, I extend special thanks to my beloved family and friends for their unwavering support and encouragement as I pursued my graduate studies.

TABLE OF CONTENTS

Contents

contents

Acronyms

ALCO	Asset and Liability Committee
ATM	Automated Teller Machine
Cash	Physical Cash/ Electronic Money/Digital Money
CBS	Core Banking System
CCRM	Corporate Customer Relationship Manager
CIT	Cash-In -Transit
CL	Currency logistics
COOP BANK	Cooperative Bank of Oromia S.C
CPO	Cashier Payment Order
CRM	Customer Relationship Management
CSCM	Cash Supply Chain Management
CSO	Customer Service Officer
FAF	Financing Approval Form
FCY	Foreign Currency
FY	Fiscal Year
HR	Human Resource
IAC	Issue Account
IT	Information Technology
NBE	National Bank of Ethiopia
RTGS	Real Time Gross Settlement

Abstract

This study examines the factors affecting cash supply chain management at Cooperative Bank of Oromia S.C., identifying key factors and proposing strategic improvements. The total population comprises 68 employees, with 60 respondents addressing major issues such as inefficiencies in cash transport and storage, weak deposit mobilization, suboptimal lending practices, underutilization of e-banking, inadequate security during cash-in-transit, and inaccurate cash demand forecasting. The research employs a quantitative approach with an exploratory design, collecting data from both primary and secondary sources. Questionnaires were used to gather data, which was then analyzed using regression analysis, frequency, and percentile measures, and correlation analysis to test the hypothesis relationships. The study reveals thatthe Durbin-Watson statistic of 1.266 suggests no autocorrelation in the residuals, supporting the model's validity. The normality of residuals is confirmed, indicating that the assumptions of the regression analysis are reasonably met, all the hypotheses significantly affect the dependent variable, with p-values below 0.05, and coefficient results confirm that there is a directrelationship between each independent variable and the dependent variablesand the relationships between all variables are strong and positive based on the correlation test. Most respondents (65% to 80%) agree on improving these independent variables: enhancing cash transport and storage systems, improving security measures, optimizing resource mobilization and lending practices, promoting e-banking, and implementing accurate cash forecasting to improve cash supply chain management. The findings indicate inefficiencies in the transport and storage of cash, weak performance in deposit mobilization and lending, suboptimal utilization of e-banking services, failures to establish strong security systems during cash-in-transit, and inaccuracies or a complete absence of accurate cash demand forecasting. Recommendations include improving cash transport and storage systems, enhancing security measures, optimizing resource mobilization and lending practices, promoting e-banking, implementing accurate cash forecasting, providing regular employee training, monitoring performance, and fostering better inter-departmental communication.Thus, by adopting strategies, the bank can enhance the efficiency, and reliability of its cash supply chain management, ultimately improving its goodwill and customer satisfaction.

Keywords; Cash supply chain, Cash in transit, Customer satisfaction

CHAPTER ONE

1. INTRODUCTION

This chapter introduces the study on factors affecting cash supply chain management practices at Coop Bank. It covers the study's background, the case company's background, the problem statement, research questions, objectives, significance, scope, limitations, definitions of key terms, and the paper's organization

1.1Background of the Study

According to Van Anholt (2014), the cash supply chain, also known as the cash cycle or currency chain, constitutes the network of organizations and individuals involved in both the upstream and downstream flows of cash. Wagner (2010) emphasizes the critical role of cash supply chain management in banking efficiency, highlighting its complex interrelations necessary for circulating currency from central banks to end users and back, which resembles a closed-loop supply chain as per the study by Rajamani et al. (2006) and Geismar et al. (2007).

Waltson and Head (2007) define cash management as the concept focused on optimizing the amount of cash available and maximizing its utilization. It entails understanding the funds available for investment and the duration they can be held (Planket, 1986).

Manjula (2021) identifies key functions of cash distribution administration, including security, transportation, information systems, and cash inventory management, with currency circulating between entities such as central banks, cash-in-transit (CIT) providers, banks, and automated teller machines (ATMs). Cash management decisions at each stage are interrelated but often beyond the control of central banks, making the currency a significant autonomous liquidity factor in the banking system, as noted by Wagner (2010).

Raheman et.al (2013) emphasize the direct impact of cash management on a firm's liquidity and profitability, underscoring cash management strategies as central to financial management, as echoed by Faque (2020). In the Ethiopian banking industry, cash supply chain management is a core activity, as cash serves as a vital medium for transactions between various entities, including suppliers and consumers, buyers and sellers, and wholesalers and retailers. Cash supply encompasses the total amount of physical currency circulating within an economy, comprising banknotes and coins held by individuals, businesses, and financial institutions.

As observed, currently, Ethiopian banks have dedicated units or departments responsible for managing cash supply across branches, between banks, currency distribution centers or issuing accounts, and ATM points. This function plays a pivotal role in meeting daily customer demands and generating income through lending, fund transfers, and other services.The Central Bank of Ethiopia primarily manages the overall cash supply, yet cash circulation in the banking industry encounters significant challenges due to internal and external factors. Addressing these challenges effectively is crucial to ensure the smooth circulation of physical cash in the market and enhance cash delivery services in Coop Bank.

The study will review relevant literature, journals, and articles, and conduct interviews to gather data for in-depth analysis. Subsequently, it will provide recommendations to address the observed problems in cash supply chain management at Coop Bank.

1.2. Background of the Organization

Coop Bank was registered on October 29, 2004, in accordance with Article 304 of the commercial code of Ethiopia, and obtained its license from the National Bank of Ethiopia under Proclamation No. 84/1994, which governs the licensing and supervision of banking businesses. It commenced operations on March 8, 2005. As of June 2023, the bank boasts total assets exceeding ETB 140 billion, with a network of 760 branches, serving 11.5 million account holders and employing over 11,500 individuals. The bank's headquarters is located in Addis Ababa.

With a broad and diversified ownership structure, Coop Bank formulated a new business strategy at the end of 2016, articulating its vision, mission, values, and objectives. Its vision is "To be the leading private bank in Ethiopia by 2025," while the mission is rooted in community engagement to provide banking solutions that enhance customer experiences, particularly for cooperatives and agro-based businesses, leveraging human resources and modern technologies to maximize stakeholder value. The core values of the bank include integrity, customer satisfaction, continuous learning, teamwork, cost consciousness, and community concern.

As of June 2023, the bank achieved an annual profit of 4.6 billion. It consistently ranks among the top privately owned banks in Ethiopia across various parameters. The major strategic objectives of the bank include maximizing profitability by improving service efficiency, market

share, and capital base, as well as ensuring excellence in customer service delivery by offering diverse products and value-added banking services.

1.3. Statement of the Problem

According to recent studies, cash continues to be a primary payment instrument worldwide, with the volume and value of cash withdrawals increasing in most countries (Zapata and Navarette 2019; Federal Reserve, 2022). Cash offers significant benefits such as anonymity, divisibility, universality (OECD 2020), and trust (Bagnall et al. 2021). The cash supply chain, also known as the cash cycle or currency chain, involves a network of organizations and individuals engaged in the upstream and downstream flows of cash (Zapata and Navarette, 2019). A study by Manjula (2023) highlights that cash distribution administration, security, transportation, information systems, and cash inventory management are fundamental functions of the cash supply chain. The National Bank of Ethiopia is responsible for printing and distributing money to all banking sectors based on their status and requests, serving as the starting point for cash distribution via commercial banks to meet customer demand for lending, withdrawals, and transfers.

In Coop Bank, physical money circulates through various transactions including cash in transit, deposits, transfers, lending, and withdrawals (ATM and Branch). However, based on customers feed back and staffs observation, challenges such as delays in cash transit, inefficiencies in cash distribution across branches, inadequate cash provision, frequent ATM downtime, and delays in cash transfers via RTGS have been observed. These issues may lead to customer dissatisfaction, negatively impacting the bank's image and overall performance.

Concerning that, there are various studies on cash supply chain management, currency logistics, and cash in transit made in a broad /other country, particularly in the banking industries, they identify that the major problems were theft, robbery, failure to outsource the cash supply activity, reviewing the contract of companies engaged in cash in transit and absence of sufficient electronic device to enhance the cash distribution only. In Ethiopia, Nedra (2023) focuses on the internal control system over Cash in the Commercial Bank of Ethiopia mainly focused on the specific Branch’s system that controls cash and she finds that the major deficiency in CBE's internal control over cash consists of cash shortages, non-continuous surprise checks, and a lack of controlling cash holding restrictions. And recommends that CBE develop surprise checks regularly on internal control over cash and better to reconsider the cash holding limits which may have negative implications on its day-to-day activities when a cash shortage happensDuguma

et.al (2021) conducted a study on cash flow management among micro-traders in Ethiopia, particularly in response to economic disruptions like the COVID-19 pandemic. Their findings indicated that many micro-businesses struggled with proper cash management, which exacerbated financial difficulties during economic downturns

Hence, the previous studies focus on cash management in the specific branch of Commercial Bank of Ethiopia, and the flow of cash among micro traders, itdon't disclose the overall Bank's Cash supply chain management system.

Nevertheless, organizations, banks, and other financial companies have their own policy and procedures regarding cash supply chain management/cash consignment. parallel to that every financial institution faces challenges in delivering cash from Bank to Bank, center to center, and Bank to customers or ATMs across all branches and work units. However, studies conducted so far do not address the flow of physical cash between banks or withina bank.

Thus, the study shall conduct a deep analysis to identify the proper cause of these problems in the cash supply chain management and forward proper recommendations for the current drawbacks in the cash supply chain system in CoopBank.

1.4. Objective of the study

1.4.1. General Objective

The general objective of the study is to assess the various factors that affect the effectiveness of cash supply chain management in the Cooperative Bank of Oromia.

1.4.2. The Specific Objectives of the Study

- To analyze the effect of cash storage on the effectiveness of cash supply chain management.
- To examine the influence of effective transportation on cash supply chain management.
- To analyze the role of e-banking platforms in minimizing problems within cash supply chain management.
- To examine the effect of a strong security system on cash supply chain management.
- To analyze how effective resource mobilization enhances cash supply chain management.

- To determine the importance of effective demand forecasting on the efficiency of cash supply chain management.
- To explore the significance of a well-managed lending system on cash supply chain management.

1.5. Hypothesis of the Study

H1:Cash storage positively affects the effectiveness of cash supply chain Management

H2: Effective cash Transportation has a positive effect on Cash supply chain management

H3: Effective Utilization ofan E-Banking platform positively affects the Cash supply chain management

H4: Having a Strong security systempositively affects the cash supply chain management

H5: Effective resource mobilization enhances cash supply chain management.

H6: Effective demand forecasting on cash enhance cash supply chain Management.

H7: Having well- managed lending system positivelyaffects cash supply chain Management

1.6. Scope of the Study

The study strictly focuses on cash supply management, covering the entire process from cash collection at the National Bank of Ethiopia to the central distribution points, branches, and ATMs, and from customers to branches up to the withdrawal point. It assesses the current performance level of the bank by investigating critical success and failure factors linked to its various branches and centers. The study aims to provide recommendations for potential improvements to enhance the bank's efficiency and effectiveness in cash supply chain management. Banking Industry Scope: The study focuses exclusively on the Cooperative Bank of Oromia and does not include other private or governmental banks. Geographic Scope: The study encompasses all regional and city cash distribution centers but does not include branches. Subject Matter Scope: The study covers cash storage, distribution, handling, transport, security systems, e-banking, deposit mobilization, and loans. Time Scope: The study period is from January 2021 to December 2023. Population and Sample Scope: The study includes all employees engaged in cash supply.

1.7. Limitations of the Study

In this study, the researcher faced several challenges, including, time limitations, and inconsistencies in network and electric power supply. However, the researcher addressed these challenges by utilizing library resources to mitigate network inconsistencies.

1.8. Significance of the Study

The study assists Coop Bank's management in decision-making by addressing the issues or challenges within cash supply chain management. It aims to uncover insights about customer satisfaction with cash provision across all branches of Coop Bank of Oromia. Furthermore, it highlights the impact of efficient cash supply chain management on the overall performance of the bank. The research serves as input for formulating policies related to the bank's cash services, helping to meet customer expectations and reduce risks in cash supply chain activities. By increasing customer satisfaction across all branches, the study also establishes a foundation for future academic research. In the banking business, cash supply chain management makes a significant contribution to the bank's performance and customer satisfaction. As a result, understanding the factors that influence cash supply chain management assists the management of the bank in improving the bank's performance. And lastly, for academicians, the findings of the study help to make further investigation in the area to add a body of knowledge.

1.9. Definition of Key Terms

- Cash:

  - ✓ According to the Federal Reserve (2019). cash is defined as physical currency, including banknotes and coins, used for transactions (Federal Reserve, 2019).
  - ✓ The European Central Bank (2021) defines cash as legal tender that is widely accepted for the exchange of goods and services (European Central Bank, 2021).

- Cash-in-Transit:

  - ✓ The International Organization for Standardization (2020) defines cash-in-transit as the physical transportation of banknotes, coins, and other valuables between locations such as banks, ATMs, and retail establishments (International Organization for Standardization, 2020).

- ✓ Manjula (2023) highlights that cash-in-transit involves the secure movement of cash to prevent theft and ensure timely delivery for operational needs (Manjula, 2023).

 Cash Supply Chain:

- ✓ Zapata and Navarette (2019) define the cash supply chain as a network of organizations and individuals engaged in the upstream and downstream flows of cash, including its production, storage, distribution, and eventual return to the central bank (Zapata and Navarette, 2019).
- ✓ The OECD (2020) describes the cash supply chain as the process involving the issuance, circulation, and return of cash within an economy, emphasizing the roles of various financial institutions and service providers (OECD, 2020)

Cash supply chain: Wagner,(2010) is the process of managing the flow of cash within an organization or across multiple organizations. It involves activities such as cash handling, cash forecasting, cash flow optimization, and risk management related to cash supply

1.10. Organization of the Study

The study consistsof five chapters, each addressing different aspects of the research. The first chapter contains the study's background, statement of the problem, research questions, and objectives. It also outlines the importance and scope of the study, providing a comprehensive overview of the research's foundation and purpose. Chapter two delves into a review of related literature, summarizing existing research and theoretical frameworks relevant to the study. Chapter three details the methodology, explaining the research design, data collection methods, and analytical techniques used. Chapter four presents the data analysis, interpreting the results, and discussing their implications. Finally, chapter five concludes the study, offering a summary of findings, conclusions drawn from the research, and recommendations for future practice or further study.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Theoretical Review

2.1.1. Introduction

This section deals with the theoretical concept, cash supply chain management, empirical knowledge as well as challenges withinthe cash supply chain. It starts with definitions ofthe concept of cash supply chain management, and cash supply chain management related to generic supply chain management.

2.1.2. Concept of Cash Supply Chain

As per the study of Anholt (2014), logistic service providers, financial institutions, and other companies cooperate to ensure businesses and consumers are supplied with sufficient, reliable, and high-quality banknotes and coins. Quite similar to the definition of a supply chain by Mentzer et al. (2001), the study defines a cash supply chain (i.e., cash cycle, cash chain, or currency chain) as the network of organizations and individuals involved in the upstream and downstream flows of cash, other valuables, supplies for self-service devices, services, finances, and information. Other valuables can be, for instance, precious metals, cheques, equities, vouchers, and supplies. Supplies can be till rolls, cartridges, and print ribbons, which are necessary for the correct functioning of self-service devices. Finances are continuously being transferred to acquit cash transactions between organizations and information flows between all the entities to support all supply chain activities. Cash of national and foreign currency is exchanged between countries and thus between multiple cash supply chains (CSCs). Some researchers identify a CSC as a closed-loop supply chain (Rajamani, 2005) because it is one of the purest supply chains where the main product (cash) flows down and up the chain without actual consumption. Cash preserves its value throughout the chain and only when the quality is insufficient according to central bank standards the cash is flagged as unfit and will be destroyed. Strictly speaking, only the global CSC (i.e., supply chains of all currencies worldwide) can be considered a closed-loop supply chain because, in contrast to national CSCs, all cash stays within the loop. In a national or a multi-national CSC, cash may be shipped across borders and can therefore leave the supply chain. For instance, the European Central Bank observed a positive net

amount of euro banknotes being shipped across European borders year after year over the past decade (ECB, 2013a). Cash management theory outlines the process of planning and regulating cash flows into and out of a business, as well as within the business, and the cash balances held at any given time (Pandey & Jaiswal, 2011). This theory suggests that efficient cash management entails determining the optimal amount of cash to hold by weighing the opportunity cost of holding excess cash against the trading cost of holding insufficient cash. By understanding this theory, the study aims to assess whether firms adhere to these guidelines and how this adherence impacts their performance. Proper cash handling is crucial since increased cash inflows heighten the risk of fraud, necessitating robust measures to prevent such risks.

2.1.3. Cash Supply Chain Management concerning Generic Supply Chain Management

Chopra et al(2020). delineate the distinct focus and scope each concept entails within organizational operations. Cash Supply Chain Management concentrates on optimizing the handling, storage, transportation, security, and forecasting of cash specifically within financial contexts. This includes strategies like cash pooling, electronic payments, fraud detection, and regulatory compliance to ensure efficient cash flow, risk mitigation, and customer satisfaction. In contrast, Generic Supply Chain Management encompasses a broader spectrum, managing the flow of goods, information, and services from suppliers to end customers across various industries. Strategies in this realm include lean manufacturing, inventory management, supply chain visibility, and sustainability practices, focusing on cost-efficiency, quality, and customer service. While specific literature comparing these two areas may be limited, foundational texts provide valuable insights. For example, "Cash Management for the Small Business" by Richard B. Lanza (2005) delves into cash management techniques applicable to businesses, offering a practical understanding of cash flow dynamics. Conversely, "Supply Chain Management: Strategy, Planning, and Operation" by Sunil Chopra et al. (2020) offers a comprehensive view of generic supply chain strategies. Although not explicitly contrasting the two, these resources contribute to understanding how cash supply chain management intersects with and contributes to broader supply chain efficiency and business success. A frequently referenced definition of a supply chain comes from Christopher (1992): "...a network of organizations involved, through upstream and downstream linkages, in the various processes and activities that create value in the form of products and services for the end consumer." Mentzer et al. (2001) analyzed different supply chain definitions and proposed a broader definition: "a set of three or more entities

(organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer." This dissertation adopts this latter definition because it encompasses the various elements exchanged between organizations and individuals and does not assume that the supply chain necessarily produces value, acknowledging that its objective might be more generic. Recently, the Council of Supply Chain Management Professionals (CSCMP) addressed the ongoing debate about defining Supply Chain Management (SCM). The definition of SCM holds significant implications for both academics and practitioners (Mentzer, Stank, and Esper, 2008). In business, the SCM definition influences decision-making regarding organizational structure, corporate culture, budgeting, and strategy. In academia, it impacts faculty lines, curriculum design, budgets, and tenure and promotion decisions. The CSCMP defines SCM as: "Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, demand creation, and fulfillment, and all logistics management activities" (Gibson, Mentzer, and Cook, 2005). In the same scenario with the cash supply chain, Anholt (2014) the study defines a cash supply chain (i.e., cash cycle, cash chain, or currency chain) as the network of organizations and individuals involved in the upstream and downstream flows of cash, other valuables, supplies for self-service devices, services, finances, and information.

2.1.4. The Historical Perspectives of Cash Supply Chain Management

According to (Davidson *et al*, 1999), cash is any medium of exchange, which is immediately negotiable. It must be free of restriction for any business purpose. Cash has to meet the prime requirements of general acceptability and availability for instant use in purchasing and paying debt. Acceptability to a bank for deposit is a common test applied to cash items. This is a process of Planning, controlling, and accounting for cash transactions and cash balances. It is channelling available cash into expenditures that enhance productivity, directly or indirectly.

Ferguson (2008). The historical perspectives of Cash Supply Chain Management (CSCM) offer a fascinating look at the evolution of cash handling, storage, transportation, and security practices over time. In ancient times, the barter system dominated trade until around 600 BC when coins were introduced, facilitating easier transactions and necessitating early forms of cash management. Civilizations like Mesopotamia, Egypt, and Greece developed various methods to securely handle and store their currency, laying the foundation for future advancements.During the medieval period, particularly in Renaissance Italy, early banking systems began to emerge as

merchants sought secure ways to manage their wealth. This era saw the introduction of promissory notes and bills of exchange, which helped reduce the risks associated with carrying large sums of money. The practices developed during this time laid the groundwork for modern cash management techniques.

Martin(2013).The historical perspectives of Cash Supply Chain Management (CSCM) reveal a fascinating evolution of how societies have managed the storage, transport, and security of cash over millennia. In ancient times, the barter system was predominant until around 600 BC when coins were introduced, facilitating easier trade and necessitating early forms of cash management. As banking systems began to emerge during the Medieval period, particularly in Renaissance Italy, the need for secure storage and management of wealth became paramount. This era also saw the introduction of promissory notes, which helped reduce the risks associated with carrying large sums of money.The Industrial Revolution in the 18th and 19th centuries marked a significant expansion of banking institutions, increasing the demand for systematic cash supply chain management. During this period, armored transport vehicles were developed to protect cash during transit. Moving into the 20th century, the establishment of central banks, such as the Federal Reserve in the USA in 1913, played a pivotal role in standardizing cash management practices. The latter part of the century witnessed the introduction of computers and automated systems in the 1960s and 70s, revolutionizing cash handling and processing methods.

The 21st century has seen a dramatic transformation in CSCM due to the rise of digital banking and electronic payments. This era emphasizes digital security and real-time tracking, reflecting the shift towards a more digital and less cash-dependent economy. Felix Martin's "Money (2013). offers a comprehensive historical perspective on money and its management, and Niall Ferguson's "The Ascent of Money: A Financial History of the World" (2008), covers the broader history of finance, including cash management.

Cash is ready money in the bank or the business. It is not inventory, it is not account receivable (what you are owed), and it is not property. These might be converted to cash at some point, but it takes cash on hand or in the bank to pay suppliers, pay the rent, and meet the payroll. Profit growth does not necessarily mean more cash (Davidson et al., 1999). Cash is an important current asset for the operations of the business. Cash is the basic input needed to keep the business running continuously: it is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more

nor less. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle. Without contributing anything towards the tint's profitability. Thus, a major function of the financial manager is to maintain a Sound cash position. (Pandey, 2007)

2.1.5. The nature and Importance of Cash Supply Chain Management.

Templar(2007). the nature and importance of Cash Supply Chain Management (CSCM) lie in its role in ensuring the efficient handling, storage, transportation, and security of cash within financial systems. CSCM involves a series of processes that ensure cash is available where and when it is needed. These processes include cash handling, such as counting, sorting, and verifying the authenticity of cash; cash storage, which involves safekeeping cash in vaults or secure locations; cash transportation, which entails moving cash between locations using armored vehicles or other secure means; and cash security, which includes implementing measures to protect cash from theft or loss during handling, storage, and transportation.W. Hoerl (2003).CSCM is critical for several reasons. Firstly, it ensures liquidity management by making sure banks and businesses have enough cash on hand to meet customer demands. Secondly, it enhances operational efficiency by streamlining processes, reducing costs, and improving the speed of cash flow. Thirdly, CSCM plays a vital role in risk mitigation by protecting against theft, fraud, and counterfeiting through robust security measures. Additionally, it ensures customer satisfaction by making sure customers can access cash when they need it, thereby enhancing trust and satisfaction. Lastly, CSCM helps financial institutions comply with regulatory requirements regarding cash handling and reporting.

The objective of cash supply management is to maintain adequate cash balances to meet present and future disbursements. Internal controls over cash management are needed at all levels of the organization that handles cash Dechow et al. (2004). Ali et al (2021) examine the alliance between cash management along the financial performance of commercial banks in Nigeria. The researchers found that cash flows of financing activities positively impact on financial performance of Nigerian banks. Results outlined that holding cash significantly adverse effect on the financial performance of sample Nigerian banks. Alslehat & AINimer (2017) analyzed the tie-up between cash flow management together with the financial efficiency of Jordanian insurance companies. In Jordan, there were twenty-three insurance businesses in the population from 2009 to 2013. The research that net cash flows from operational and investment activities had a positive effect on the financial performance (return on assets) of insurance companies in

Jordan.The Cash Supply Chain Management platform is a unified environment for the execution and control of all processes related to cash orders for bank branches, cash centers, vaults, ATMs, and other service points. ATM cash replenishment optimization reduces operating expenses and provides ATM networks (as well as the entire cash network) with a sufficient amount of cash.
According to Zimmerer et al (2008), cash management is the process of forecasting, collecting, disbursing, investing, and planning for cash a company needs to operate smoothly. They further added that cash management is a vital task because it is the most important yet least productive asset that a small business owns. A business must have enough cash to meet its obligations or it will be declared bankrupt. Creditors, employees, and lenders expect to be paid on time and cash is the required medium of exchange. The term "Cash" is may categorized as Electronic Money /Digital/ and physical cash that widely used in the third world, this liquid asset has a vital role, particularly in the banking industry in meeting customer satisfaction.

2.1.6. Theories of Cash Supply Chain Management

S.templer(2007).Theories of Cash Supply Chain Management (CSCM) are grounded in various principles of logistics, operations management, and financial management, offering a framework for efficient cash handling, storage, transportation, and security. One key theory is the Economic Order Quantity (EOQ) model, initially developed by Ford W. Harris in 1913, which helps determine the optimal order quantity that minimizes the total cost of ordering and holding cash. Another important concept is Just-in-Time (JIT) inventory management, developed by Taiichi Ohno for Toyota in the 1950s, which focuses on reducing inventory levels and delivering cash only as needed to minimize holding costs. The Cash Conversion Cycle (CCC) is a critical financial metric that measures the time taken to convert cash into inventory, sales, and back into cash, helping to optimize the flow of cash through the supply chain. This concept was popularized by Richard Brealey and Stewart Myers in their book "Principles of Corporate Finance" (first published in 1981). Additionally, Transaction Cost Economics (TCE), introduced by Ronald Coase in 1937 and further developed by Oliver Williamson, examines the cost of transactions within a firm, helping to minimize the costs associated with cash transactions and handling when applied to CSCM.

Cash supply management theory outlines the process of planning and regulating cash flows into and out of a business, as well as within the business and the cash balances held at any given time (Pandey & Jaiswal, 2011). This theory suggests that efficient cash management entails

determining the optimal amount of cash to hold by weighing the opportunity cost of holding excess cash against the trading cost of holding insufficient cash. By understanding this theory, the study aims to assess whether firms adhere to these guidelines and how this adherence impacts their performance. Proper cash handling is crucial since increased cash inflows heighten the risk of fraud, necessitating robust measures to prevent such risks.

Cash Management Theory, initially proposed by William Baumol in 1952, serves as a framework for balancing a firm's liquidity and profitability by optimizing cash and marketable securities. The theory, which parallels the economic order quantity model used in inventory management, advocates for minimizing the opportunity cost of holding cash by replenishing cash balances at fixed intervals and amounts. This theory is particularly relevant to understanding the impact of cash storage on the financial performance of commercial banks in Kenya, as it helps determine the optimal cash reserves that maximize returns and minimize risks. Cash reserves are crucial for meeting daily transaction needs, regulatory requirements, and contingency plans. However, holding excessive cash can diminish profitability since cash does not earn interest and incurs storage and handling costs. Thus, banks must balance liquidity and profitability by applying the principles of Cash Management Theory (Cadenillas, 2021; Khatib et al., 2022). The way banks manage their cash directly influences their profitability, making it essential for them to adopt strategies that prevent insolvency and ensure efficient cash maintenance

2.1.7. Dimensions of Cash Supply Chain Management

Pagnattaro et al. (2019) Dimensions of Cash Supply Chain Management (CSCM) encompass various aspects that ensure the effective and efficient flow of cash within financial systems. These dimensions include cash handling, cash storage, cash transportation, cash security, cash forecasting, and regulatory compliance, each playing a crucial role in maintaining the overall integrity and efficiency of the cash supply chain.Cash handling involves the physical processing of cash, such as counting, sorting, and verifying the authenticity of banknotes. This process is essential for ensuring accuracy and preventing fraud. The book "Cash Logistics: A Practical Guide" by Ronald D. Snee and Roger W. Hoerl (2003) discusses best practices in cash handling, emphasizing the importance of meticulous processing. Cash storage refers to the safe and secure storage of cash in vaults or other secure locations to prevent theft or loss. Insights on secure cash

storage can be found in "Bank Security" by Tim Giles (2004), which details the measures needed to protect stored cash.

Cash transportation is the secure movement of cash between locations, often involving armored vehicles and other security measures. This dimension ensures that cash is moved safely and efficiently to where it is needed. "Armored Car Service: A Guide for the Armored Car Industry" by Roger S. Fitch (2005) provides detailed information on the best practices and security protocols for cash transportation. Cash security encompasses the measures taken to protect cash from theft, fraud, and other security threats during handling, storage, and transportation. Effective strategies for ensuring cash security are covered in "Effective Physical Security" by Lawrence J. Fennelly (2012).

According to Samonas.et.al (2015) Cash forecasting involves predicting future cash needs to ensure adequate liquidity and optimal cash levels. This dimension is critical for maintaining financial stability and avoiding shortages or surpluses. "Financial Forecasting, Analysis, and Modelling: A Framework for Long-Term Forecasting" by Michael Samonas (2015) covers techniques and methods for accurate cash forecasting. Lastly, regulatory compliance involves adhering to laws and regulations governing cash handling and management, ensuring that financial institutions operate within legal boundaries. "The Legal and Regulatory Environment of Business" by Marisa Anne Pagnattaro et al (2019). includes comprehensive information on regulatory compliance related to cash management.These dimensions collectively ensure that the cash supply chain operates smoothly, efficiently, and securely, meeting the needs of financial institutions and businesses. Each dimension is supported by key publications that provide detailed guidance and best practices, contributing to the effective management of cash within the financial system.

According to a study by Manjula (2021). the movement of Sri Lankan currency mirrors the flow of retail products within the supply chain. Banks, as service providers, strive for optimal service delivery in their cash supply chain to ensure customer satisfaction. However, the study indicates that most Sri Lankan banks have not fully achieved maximum operational efficiency in their cash supply chain. Branch managers' satisfaction levels vary significantly, ranging from 47% to 72%. Moreover, statistical analysis suggests that less than half of bank managers express satisfaction with the current cash supply chain, highlighting strategic gaps that need attention to optimize money supply chains using globally recognized management strategies.The study identifies

certain factors contributing to higher satisfaction levels among private banks compared to state banks, notably in Information Technology systems for communication, Asset and Liability Management functions, information security, and business continuity. Banks that outsource services or utilize central cash processing units also demonstrate higher satisfaction levels than those with decentralized cash distribution administration. However, there's no substantial difference in overall satisfaction between government and private banks.Despite these insights, there are noticeable gaps in areas like cash distribution administration, security, transportation, information systems, and cash inventory management, all critical aspects of the cash supply chain. The COVID-19 pandemic has prompted banks to reevaluate their business continuity strategies based on current challenges. The study employs an Analytic Hierarchy Process (AHP) mathematical model, identifying Physical Security, Service Point Capacity, Insurance, Information Systems, Distribution, and Cash Inventory as key areas requiring focused attention for strategic development in Sri Lanka's cash supply chain.

Bodi-Schubert et.al (2012). focused on the analysis of the Hungarian Cash supply. The commercial banks put in place ATMS after weighing the benefits versus costs of either having the ATMS or having cash in transit for cash removal. This is by establishing the lost interest for cash that is in stock versus the fees that Cash in transit will need for removal. if the interest is low, there is a need to have a low removal by the CIT and focus more on the use of ATMS.

2.2. Theoretical Framework

The theoretical framework provides the foundation for your research, outlining the key concepts, theories, and models that guide your study on Cash Supply Chain Management (CSCM) in a private banking context. It explains the relationship between various elements of CSCM and how they impact the overall efficiency and effectiveness of cash management.

1. Cash Supply Chain Management (CSCM); CSCM refers to the management of cash flow from central banks to branches and ATMs. It includes various processes such as cash ordering, transportation, storage, distribution, and replenishment. Effective CSCM ensures sufficient cash availability while minimizing costs and risks.

2. Key Concepts and Theories

a. Cash Flow Theory

Cash flow theory emphasizes the importance of managing cash inflows and outflows to ensure liquidity. In the context of a private bank, this involves optimizing the cash supply chain to meet customer demand while maintaining adequate reserves and minimizing idle cash (Brigham & Ehrhardt, 2013).

b. Inventory Management Theory

Inventory management theory, particularly the Economic Order Quantity (EOQ) model, can be applied to CSCM. This model helps determine the optimal amount of cash to order and hold at various points in the supply chain to minimize costs associated with ordering, holding, and shortages (Harris, 1913).

c. Risk Management Theory

Risk management theory is crucial in CSCM, as it involves identifying, assessing, and mitigating risks related to cash handling and transportation. This includes security risks, theft, and operational risks (Jorion, 2007).

d. Supply Chain Management Theory

General supply chain management theory provides a broad framework for understanding how to efficiently manage the flow of goods, or in this case, cash. Key principles include coordination, integration, and optimization of all activities involved in the supply chain (Christopher, 2016).

3. Elements of Cash Supply Chain Management

a. Cash Ordering

Cash ordering involves forecasting cash demand at branches and ATMs and placing orders with the central bank. Accurate forecasting models are essential to avoid overstocking or stockouts (Makridakis, Wheelwright, & Hyndman, 1998).

b. Cash Transportation

Transportation of cash from the central bank to branches and ATMs involves logistical planning and coordination with security services. Theories related to logistics and transportation management apply here (Bowersox, Closs, & Cooper, 2002).

c. Cash Storage

Cash storage includes the safekeeping of cash at branches and ATMs. This involves security measures and inventory management practices to ensure optimal levels of cash are maintained (Arnold, 2008).

d. Cash Distribution

Distribution of cash involves replenishing ATMs and branch cash reserves. Effective distribution strategies ensure timely and cost-efficient delivery of cash to where it is needed most (Simchi-Levi, Kaminsky, & Simchi-Levi, 2008).

e. Cash Replenishment

Replenishment involves regularly restocking ATMs and branches to meet customer demand. This requires monitoring cash usage patterns and adjusting replenishment schedules accordingly (Silver, Pyke, & Peterson, 1998).

The theoretical framework provides a structured approach to studying CSCM in the context of a private bank. By applying relevant theories and models, the study aims to identify factors that enhance the efficiency and effectiveness of cash management from central banks to branches and ATMs.This framework is the foundation for your research, guiding data collection, analysis, and interpretation to address the research objectives and hypotheses.

2.3. Empirical Review

Cash supply chain management is a critical component of financial logistics, encompassing the processes involved in the production, distribution, and management of physical cash. This empirical review aims to provide a comprehensive overview of the current state of research on

cash supply chains, identifying trends, challenges, and opportunities for further study and improvement.

2.3.1. Cash Supply Chain Management Practices

Optimizing Cash Supply Chain Management in Retail Banking: A Case Study Analysis" Williams,et.al (2019).This study delves into the optimization of cash supply chain management practices within the retail banking sector. Through a comprehensive case study analysis of multiple retail banks, the researchers examine various aspects such as cash handling processes, ATM replenishment strategies, forecasting accuracy, and security measures. The study aims to identify best practices and challenges faced by retail banks in managing their cash supply chains efficiently."Effective Cash Supply Chain Management in Fast-Moving Consumer Goods (FMCG) Industry: A Comparative Study" by John S.et.al(2020).Focusing on the Fast-Moving Consumer Goods (FMCG) industry, this empirical study conducts a comparative analysis of cash supply chain management practices. It evaluates key metrics such as inventory turnover, cash conversion cycles, supplier payment terms, and distribution network efficiency across FMCG companies. By comparing and contrasting these practices, the study aims to highlight successful strategies and areas for improvement in cash supply chain management within the FMCG sector."Cash Supply Chain Optimization in Manufacturing: A Process Improvement Study" by Jennifer A.et.al (2018). This study delves into cash supply chain optimization specifically within the manufacturing sector. The researchers evaluate various aspects such as cash flow forecasting accuracy, inventory management practices, negotiation of payment terms with suppliers, and optimization of working capital. Through process improvement methodologies and data analysis, the study aims to identify opportunities for streamlining cash supply chain processes and reducing costs in manufacturing companies.

"Enhancing Cash Supply Chain Resilience: Lessons from Disaster Recovery Planning" by Clark,et. Al (2017). Focused on resilience, this empirical study explores strategies for enhancing cash supply chain resilience, particularly in the context of disaster recovery planning. The researchers assess the impact of disruptions on cash flow, contingency planning for cash distribution and replenishment, and the role of technology in ensuring continuity. By studying companies with robust disaster recovery plans, the study provides insights into building resilience and continuity in cash supply chains."Cash Supply Chain Security Practices: A Comparative Analysis of Banking and Retail Sectors" by Andrew.et.al (2016).This study

conducts a comparative analysis of cash supply chain security practices in the banking and retail sectors. It examines various security measures such as cash handling procedures, cash-in-transit security, counterfeit detection technologies, and employee training programs. Through benchmarking security practices across sectors, the study aims to identify effective measures for mitigating risks and enhancing security in cash supply chains.

Cash Supply Chain Management Practices and Financial Performance: A Longitudinal Analysis" by John et.al (2019).This longitudinal study delves into the relationship between cash supply chain management practices and financial performance over time. By analyzing metrics such as cash conversion cycles, cash-to-cash cycle times, working capital ratios, and profitability indicators, the research aims to understand how effective cash supply chain management impacts overall financial performance. Through a longitudinal approach involving multiple companies across industries, the study provides insights into the long-term benefits of optimized cash supply chain practices."Integration of Cash Supply Chain and Inventory Management: Case Studies from Retail and Manufacturing Sectors" by Emily.et.al (2020). Focusing on integration, this study examines how companies in the retail and manufacturing sectors align cash supply chain management with inventory management practices. Through in-depth case studies, the researchers explore strategies that improve operational efficiency, demand forecasting accuracy, and supply chain optimization by integrating cash flow management with inventory control. The study highlights successful integration approaches and their impact on financial performance.

"Cash Supply Chain Sustainability Practices: A Comparative Analysis of Green Initiatives" by Maria,et.al(2018).This comparative analysis study evaluates cash supply chain sustainability practices, focusing on green initiatives. By comparing practices such as green cash handling technologies, renewable energy usage, recycling programs for currency, and carbon footprint reduction strategies, the research aims to identify best practices for integrating sustainability into cash supply chain management. The study contributes to understanding how sustainability initiatives can enhance operational efficiency and reduce environmental impact in cash supply chains."Cash Supply Chain Risk Management: Case Studies from the Banking and Logistics Industries" by Mark T.(2017).Investigating risk management, this study analyzes cash supply chain risk management practices in the banking and logistics industries. Through case studies and risk assessment frameworks, the researchers examine how companies identify, assess, mitigate, and monitor risks associated with cash handling, transportation, storage, and security.

The study provides insights into effective risk management strategies and their impact on operational resilience and financial stability."Innovative Technologies in Cash Supply Chain Management: A Study of Adoption and Impact" by David M..al (2016).Focused on technology adoption, this empirical study assesses the adoption and impact of innovative technologies in cash supply chain management. By evaluating technologies such as cash recycling machines, RFID tracking systems, digital payment solutions, and blockchain applications, the research explores their impact on operational efficiency, cost reduction, security enhancement, and customer experience. The study highlights the potential benefits of adopting innovative technologies in optimizing cash supply chain management practices.

According to Tavares (2014). in the cash supply chain, only one product, cash is transported in a two-way flow. Managing cash involves significant transportation, handling, and sorting costs, as well as high opportunity costs due to cash's high liquidity. This study examines cash inventory management from the perspective of commercial bank branches. A multi-period optimization model is developed to aid decision-making in cash management and planning. The model minimizes total costs by determining the optimal periods and amounts for cash collections and supplies, considering the involved costs, current inventory, and anticipated demand.

Daily cash demand consists of over-the-counter (OTC) deposits, OTC withdrawals, and Automatic Teller Machine (ATM) withdrawals. Several linear regression models were tested to forecast demand for these components, but none of the models explained a significant portion of the demand across the eight branches analyzed. Among these, ATM withdrawal forecast models performed the best. The optimization model was applied to selected branches, with results analyzed over two months. Due to the poor performance of the demand forecasts, the optimization model assumes perfect information on future demand.Implementing the optimization model resulted in a 34.6% to 61% reduction in total costs compared to the costs incurred by each branch without optimization, indicating significant potential for cost savings. Sensitivity analysis suggests that total costs are highly sensitive to the opportunity costs associated with capital held in inventory.

2.3.2. Determinants of Cash Supply Chain Management

E-Banking

The effect of e-banking on cash demand was explored in "The Effect of Digital Payments on Cash Demand and Cash Supply Chain Management" by Williams et.al, published in 2019 in the Journal of Payment Systems and Strategy. This study found that increased adoption of digital payments led to a significant decrease in cash withdrawals, requiring banks to adjust their cash management strategies. Regulatory impacts were examined in "Regulatory Influence on Cash Supply Chain Management in Banking" by Karen Thompson and Robert Miller, published in 2021 in the Banking Regulation Review. This research highlighted how compliance with anti-money laundering regulations and central bank policies often increases operational costs and necessitates robust internal controls.

The Role of Information Technology in Cash Management: An Empirical Study by Sarah.et.al (2018).

Focused on the role of information technology (IT) in cash management, this empirical study investigates the adoption and utilization of IT solutions in shaping cash management practices. Through surveys, case studies, and IT system evaluations, the researchers examine how cash management software, electronic payment systems, and digital platforms impact cash flow forecasting, transaction processing, and overall cash management efficiency. The study aims to identify best practices in leveraging IT for effective cash management strategies.

Cash demand

Economic factors influencing CSCM were analyzed in "The Influence of Economic Variables on Cash Supply Chain Management" by Alan Walker and Jessica Davis, published in 2017 in Economic Perspectives. The study concluded that high inflation increases cash demand, while higher interest rates reduce the propensity to hold large cash inventories, suggesting that banks need to monitor economic indicators closely. Lastly, the study "Analyzing Bank-Specific Determinants of Cash Supply Chain Efficiency" by Richard Green and Natalie Harris, published in 2022 in the Journal of Banking and Finance, focused on how branch network size and financial health impact CSCM efficiency. The findings indicated that banks with extensive branch networks and strong financial positions were better able to manage cash supplies and reduce operational risks.

2.3.2.1. . Internal and ExternalInfluence

Factors Influencing Cash Management Practices: Evidence from Manufacturing Firms by John.et.al (2020).This study delves into the factors that shape cash management practices within manufacturing firms. Through surveys, interviews, and financial analysis, the researchers explore variables such as industry dynamics, company size, financial performance, and technological adoption. By analyzing these factors, the study aims to uncover their impact on cash management strategies, including cash flow forecasting, working capital management, and liquidity optimization. The findings provide valuable insights into how manufacturing firms adapt their cash management practices based on internal and external influences.

As per the study of Abudu (2018). The primary goal of the paper is to examine the bank-specific factors that influence the financial performance of private commercial banks in Ethiopia. This study focuses on six private commercial banks, selected based on the availability of comprehensive financial data up to 2017. The research period spans from 2011 to 2017, utilizing audited annual financial reports from these banks. The methodological approaches employed include descriptive statistics, Pearson Correlation Coefficient, and Multiple Linear Regression Analysis.

In this study, return on equity (ROE), return on assets (ROA), and net interest margin (NIM) are used as dependent variables, while independent variables include bank size, liquidity management, asset quality, management efficiency, and capital adequacy. Autocorrelation issues were examined and addressed.

The findings reveal that capital adequacy, management efficiency, and bank size positively and significantly affect the financial performance of Ethiopian private commercial banks, as measured by ROA, ROE, and NIM. Conversely, liquidity management has a significantly negative impact on financial performance (ROE). Additionally, asset quality is not a statistically significant determinant of financial performance for these banks.

Based on these results, it is recommended that commercial banks prioritize ensuring adequate capital, maintaining optimal liquidity, implementing efficient expense management systems, and managing asset size to enhance their performance and profitability.

2.3.2.2. Regulatory Environment

Regulatory Environment and Cash Management Strategies: A Comparative Studyby David, et.al (2019)This comparative study explores the influence of regulatory environments on cash management strategies across different industries and regions. By analyzing regulatory frameworks, compliance requirements, banking regulations, and financial reporting standards, the researchers assess how these factors shape cash management decisions. Through cross-country comparisons and industry-specific analyses, the study provides insights into the challenges and opportunities posed by regulatory environments on cash management practices.

2.3.2.3. Optimizing Cash Management

"Cash Management Practices in Small and Medium Enterprises: A Cross-Industry Analysis" by Jessica (2017).Focusing on small and medium enterprises (SMEs), this study conducts a cross-industry analysis of cash management practices. By examining industry-specific factors such as seasonality, payment terms, working capital requirements, and supply chain dynamics, the researchers identify key influencers of cash management strategies in SMEs. The study aims to provide tailored recommendations for optimizing cash management practices based on industry context and operational challenges faced by SMEs.

"Globalization and Cash Management: A Multinational Corporation Study" by Andrew Roberts and Maria Garcia (2016):This empirical study investigates the impact of globalization on cash management practices in multinational corporations (MNCs). By analyzing factors such as currency risk management, international cash flows, offshore cash management structures, and cross-border payment mechanisms, the researchers assess how MNCs adapt their cash management strategies to operate effectively in diverse geographical markets. The study aims to uncover best practices in global cash management for MNCs navigating complex international financial landscapes.

2.3.2.4. Improving LogisticsEfficiency

The study titled "Improving Cash Logistics Efficiency in the Banking Sector" by John.et.al (2018).in the Journal of Financial Services Research, found that optimizing the routing and scheduling of cash deliveries could reduce costs by up to 20%, emphasizing the importance of secure transport and efficient planning. Another significant study, "Enhancing Cash Demand Forecasting Using Machine Learning Techniques" by Michael Johnson and Sarah Lee, published in 2020 in the International Journal of Forecasting, demonstrated that machine learning models

improved forecast accuracy by 15% compared to traditional statistical methods, underscoring the role of data analytics in CSCM.

2.3.2.5. Asset Quality

In the study "Asset Quality, Nonperforming Loans, and Cash Supply Chain Efficiency" by Brown et.al, published in 2020 in the International Journal of Financial Studies, the authors explored how asset quality, particularly the proportion of NPLs, affects CSCM efficiency. They found that poor asset quality due to high NPLs results in increased provisioning for loan losses, thereby reducing the available cash for other banking operations. This study emphasized the importance of managing NPLs effectively to maintain CSCM efficiency.

Similarly, "Nonperforming Loans and Their Impact on Liquidity Management in Banks" by Robert,et.al(2018). in the Journal of Financial Risk Management, investigated how NPLs influence liquidity management practices in banks. The study found that banks with high NPL levels tend to hold larger cash buffers to mitigate the risks associated with potential loan defaults, which can strain the cash supply chain, leading to higher operational costs and inefficiencies. The research suggested that effective NPL management is crucial for optimizing liquidity and ensuring smooth cash supply operations.

The study "Economic Downturns, Nonperforming Loans, and Cash Management Strategies" by David, et.al(2021). in the Economic Review Journal, analyzed the impact of economic downturns on NPL levels and their effects on cash management strategies in banks. It found that during economic downturns, the rise in NPLs puts additional pressure on banks' liquidity, necessitating more stringent cash management practices. This study highlighted the importance of proactive NPL management to cushion the adverse effects on cash supply chains during economic crises.Lastly, the empirical research "Regulatory Policies, Nonperforming Loans, and Their Effect on Cash Supply Chain Management" by Alan W.et.al (2017). in the Journal of Financial Regulation, focused on how regulatory policies aimed at managing NPLs impact CSCM. The authors found that stringent regulatory requirements for provisioning and capital adequacy can exacerbate the effects of NPLs on cash supply chains by limiting the cash available for other operations. The study recommended balanced regulatory approaches to ensure that NPL management does not unduly constrain banks' liquidity and cash management capabilities.

Empirical studies on the effect of security problems on cash in transit (CIT) reveal significant impacts on operational costs, efficiency, personnel well-being, and risk management strategies.

For instance, the study titled "The Cost Implications of Security Challenges in Cash-in-Transit Operations" by Jane,et.al (2017). in the Journal of Financial Logistics, analyzed the operational costs associated with security breaches in CIT operations. The authors found that security incidents, such as robberies and thefts, significantly increase the overall costs of cash transportation due to the need for enhanced security measures, higher insurance premiums, and loss recovery expenses. This study highlighted the substantial portion of budgets that banks and CIT companies allocate to mitigate security risks.

In another study, "Security Threats and Their Impact on Cash Handling Efficiency in Transit" by Lee,et.al (2019). in the International Journal of Banking Operations, the researchers investigated how security threats affect the efficiency of cash handling during transit. Their findings indicated that security concerns lead to delays in cash deliveries, increased time for cash processing, and disruptions in the cash supply chain. The study noted that while stringent security protocols are necessary, they often result in slower operations and higher labor costs.The study "Risk Management Practices in Cash-in-Transit: An Empirical Study" by Robert,et.al (2020). in the Journal of Risk Management, focused on the risk management practices adopted by banks and CIT companies to address security problems. The authors found that comprehensive risk assessments, the use of armored vehicles, real-time tracking systems, and training programs for CIT personnel significantly reduce the incidence of security breaches. This study emphasized the importance of investing in advanced security technologies and protocols to enhance the safety and reliability of CIT operations.

Examining the psychological impact, the study "The Psychological Effects of Security Threats on Cash-in-Transit Personnel" by David Nguyen and Laura Williams, published in 2018 in the Occupational Health Journal, revealed that frequent exposure to security risks leads to increased stress, anxiety, and job dissatisfaction among CIT employees. The study suggested that providing psychological support and implementing robust security measures can help alleviate these negative effects and improve employee well-being.Lastly, the study "The Role of Insurance in Managing Security Risks in Cash-in-Transit" by Alan.et.al(2021) in the Journal of Insurance Studies, explored the role of insurance in managing security risks associated with CIT. The authors found that while insurance helps mitigate financial losses due to security incidents, the high premiums and deductibles can significantly increase the overall cost of CIT operations.

They recommended that CIT companies balance the use of insurance with proactive security measures to manage costs effectively.

2.3.3. Cash Supply Chain Performances

Impact of Cash Supply Chain Efficiency on Financial Performance: An Empirical Analysis" by John.et.al (2020).This study delves into the impact of cash supply chain efficiency on overall financial performance. Using quantitative methods and financial data analysis, the researchers measure key performance indicators such as cash conversion cycles, working capital turnover, and liquidity ratios. By examining these metrics, the study aims to identify how improvements in cash supply chain management can positively influence financial performance across different industries.

"Cash Supply Chain Agility and Business Resilience: An Empirical Study" by Michael,et.al (2019).

Focusing on agility and resilience, this empirical study explores the relationship between cash supply chain agility and business resilience. Through surveys, case studies, and statistical analysis, the researchers assess factors such as responsiveness to cash flow fluctuations, adaptability to market changes, and recovery capabilities during disruptions. The study aims to understand how agile cash supply chains contribute to business resilience and long-term sustainability.

"Cash Supply Chain Performance Benchmarking: A Comparative Analysis Across Industries" by David.et.al(2018).This study conducts a comparative analysis of cash supply chain performance across different industries. Using benchmarking techniques, the researchers compare key performance metrics like cash turnover ratios, days sales outstanding (DSO), cash flow forecasting accuracy, and cost-to-serve indicators. By identifying industry-specific benchmarks and best practices, the study provides insights into optimizing cash supply chain performance.

"The Role of Technology in Enhancing Cash Supply Chain Performance: Evidence from Case Studies" by Thompson,et.al (2017)This empirical study investigates the role of technology in enhancing cash supply chain performance. Through case studies and technology adoption analysis, the researchers evaluate how technologies such as cash management software, automation tools, and digital payment solutions impact cash flow visibility, operational

efficiency, and cost reduction. The study aims to identify technological interventions that improve cash supply chain performance outcomes.

"Supply Chain Collaboration and Cash Supply Chain Performance: A Cross-Industry Analysis" by Andrew et.al (2016):Focused on collaboration, this study explores the impact of supply chain collaboration on cash supply chain performance. Through surveys, interviews, and performance metrics analysis, the researchers assess collaboration practices like supplier partnerships, customer collaboration initiatives, and supply chain integration. By understanding how collaborative relationships influence cash supply chain performance metrics, the study provides insights into enhancing overall business outcomes.

2.4. Measurements of Cash Supply Chain Management Practices

Measuring Cash Supply Chain Management involves assessing various metrics and performance indicators to evaluate the efficiency, effectiveness, and overall success of cash handling, storage, transportation, security, and forecasting practices within an organization. These measurements help identify areas for improvement, optimize cash flow, manage risks, and enhance customer satisfaction E. Girouard (2017).

H. Kent et.al (2010). offers insights into measuring cash management effectiveness within corporate strategies, including key metrics and performance indicators. Key metrics in measuring Cash Supply Chain Management include the Cash-to-Cash Cycle Time, which measures the time taken for cash to move through the supply chain, Cash Conversion Efficiency, which evaluates how efficiently cash is converted into revenue or profits, Cash Forecast Accuracy, which assesses the accuracy of cash flow forecasts, Cash Holding Costs, which calculates the costs associated with holding cash, Cash Flow Variability, which measures the variability or volatility of cash flows, and the Cash-to-Working Capital Ratio, which compares the amount of cash held to the total working capital.

Cash Flow Management: A Guide for Business Owners" by E. Girouard (2017). focuses on practical approaches to cash flow management, including measuring and improving cash supply chain management practices. Additionally, "Supply Chain Management Metrics: Measuring and Managing Performance" by Martin Christopher (2006). provides a framework for measuring supply chain performance, which can be adapted to include cash management metrics. These resources, combined with industry-specific guidelines and best practices, can help organizations

develop robust measurement frameworks for evaluating and enhancing their cash supply chain management practices

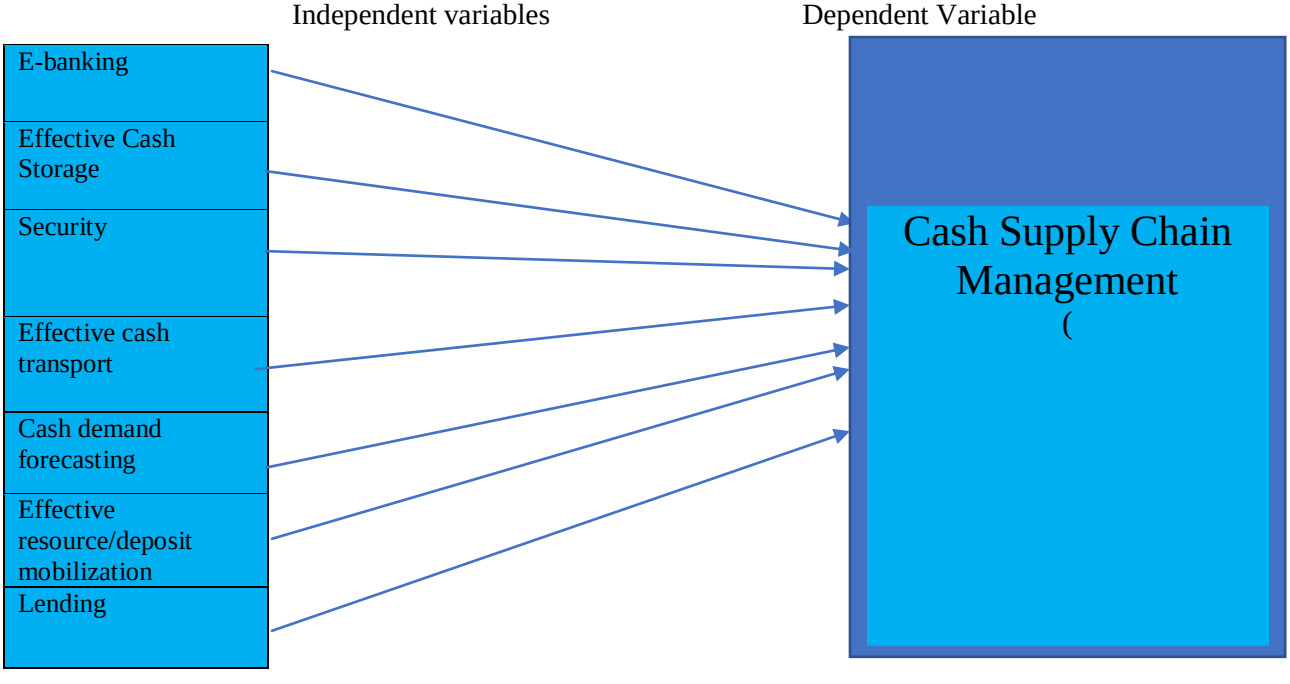
2.5. Summary of Gaps in the Empirical Studies

Even though several studies have been conducted before at the international level on the constraints of cash supply chain management, there is a gap among different researchers and research findings. Among these, the following are some of the findings of the previously conducted research. Brown et al. (2020) discussed the impact of asset quality and NPLs on CSCM efficiency, and Robert et al. (2018) examined the influence of NPLs on liquidity management. While these studies highlight the financial risks associated with NPLs, they do not delve into specific CSCM strategies to effectively mitigate these risks. Further research could explore targeted risk management techniques within the CSCM context, addressing how to manage and mitigate the impacts of NPLs more effectively.

David et al. (2021) analyzed the impact of economic downturns on NPLs and cash management strategies, and Alan W. et al. (2017) investigated the effects of regulatory policies on CSCM. These studies address external factors like economic downturns and regulatory changes but do not extensively explore actionable strategies or best practices for CSCM resilience. There is a need for integrated research on resilience strategies that can help CSCM adapt to economic and regulatory uncertainties, providing practical approaches for maintaining stability and efficiency under adverse conditions.The current research landscape provides insights into specific aspects of CSCM, such as operational efficiency, technology adoption, and risk management. However, there is a lack of integrated studies that consider a holistic CSCM framework. Research should focus on comprehensive frameworks that encompass strategic planning, regulatory compliance, and resilience strategies in dynamic business environments. This approach would provide a more robust and adaptable strategy for managing cash supply chains, addressing the interconnected nature of various CSCM components.Thus,the identified gaps highlight the need for a more integrated and holistic approach to CSCM research. Future studies should aim to integrate operational efficiencies into broader CSCM strategies, develop specific risk management techniques for mitigating NPL impacts, and establish comprehensive CSCM frameworks that address strategic and resilience aspects. This comprehensive approach would enhance the effectiveness and adaptability of cash supply chain management in various contexts

2.6. Conceptual Framework of the study

Conceptual frameworks function similarly to maps, providing coherence to empirical research. Botha (1999) describes conceptual frameworks as "a type of intermediate theory that aims to link all facets of inquiry (such as problem definition, purpose, literature review, methodology, data collection, and analysis)." A conceptual framework was developed to guide the creation of the survey instruments discussed in earlier chapters. From the literature review discussed above, the study has been constructed with the following conceptual framework to summarize the main focus and scope of this study in terms of dependent and independent variables included.



Sources: Tavares, (2014), David,et.al,(2019), Brown et.al,(2020), Robert et.al,(2018), andJane et.al, (2017)

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter focused on the research methodology that reflects the research design, data sources, study population, sampling procedure, data gathering tools, data collection procedure, operationalization of variables, Data Analysis, and validity and reliability of the study.

3.2. Description of the study area

The study area for this research is the Cooperative Bank of Oromia S.C. in accordance with Article 304 of the commercial code of Ethiopia obtained its license from the National Bank of Ethiopia under Proclamation No. 84/1994, which governs the licensing and supervision of banking businesses. It commenced operations on March 8, 2005. The head office is located in Bole Sub-City, in Addis Ababa.

The Bank has various divisions led by the seven Vice presidents under its structure: Human resource and Development, Operation and Business Support, Marketing, and Strategy Finance and Facility Management, Credit, International Trade Services, Risk, and Compliance, and Internal Audit. There are fifty Directors under seven vice presidents for each division. Thus, the area of study focuses on the Cash supply services which is the activity work unit that has been managed under the vice president of Finance and Facility Management.

3.3. Research Paradigm, Approach, and Design

3.3.1. Research Paradigm

As per Lincoln(1985).A research paradigm discusses a set of beliefs, values, assumptions, and methods that direct how researchers approach and conduct their research. It provides a framework for understanding and interpreting the facts and designing and implementing research studies. Research paradigms influence various aspects of research, including the choice of research methods, data collection techniques, data analysis procedures, and the interpretation of research findings. Thus, the Positivism paradigm is based on the belief that the social world can be studied objectively and that there are objective truths that can be discovered through empirical

observation and measurement. Positivist research often involves quantitative methods, and statistical analysis, and aims to uncover causal relationships between variables.

3.3.2. Research Approach

This research approach indicates a broad view of the study that planned to conduct the study by using research questions, the data shall be collected quantitatively, and data will be analysed quantitatively. The main target of the study shall be to assess and identify the factors affecting the Cash supply chain Management efficiency in Coop Bank of Oromia S.C. Data collection shall be through questionnaires from the respondents and organize, interpret, and present using tables, and percentages. Thus, the study uses a quantitative approach to geta comprehensive and scientifically rigorous analysis of the factors affecting cash supply chain management, offering valuable insights and practical recommendations for improving the system.

3.3.3. Research Design

Explanatory and descriptive types of research design used to identify and evaluate the causal relationships between the different variables under consideration (Creswell, 2009). So, the explanatory and descriptive research design was employed to examine the relationship between the dependent and independent variables. When researchers focus on understanding cause-effect relationships, their study takes on an explanatory approach, as described by Yin (1994). This type of research aims to explain which causes lead to which effects. The primary concern in causal analysis is understanding how one variable influences or causes changes in another variable. A strict interpretation of causation suggests that an external factor triggers a change in the dependent variable.Explanatory research, grounded in theory, is another purpose of research, particularly aiming to answer why and how questions. Unlike merely describing phenomena (as in descriptive studies), explanatory studies delve deeper into understanding, explaining, predicting, and controlling relationships between variables. These studies use theories or hypotheses to represent the forces behind a certain phenomenon.

In this context, the independent variable represents the ancestor phenomenon, while the dependent variable corresponds to the consequent phenomenon. Explanatory research studies are essential for accurately explaining the effects and relationships between independent variables and the dependent variable.

3.4. Unit of Analysis

The unit of analysis in the research methodology refers to the specific entity or level of observation that researchers focus on when collecting and analyzing data, M.Blalock, (1960). It is the primary unit or level of measurement used to examine variables and relationships in a research study. The choice of unit of analysis depends on the research question, objectives, and the level at which data are collected and analyzed. So, an individual-based unit of analysis is deployed because data is collected based onthe experiences of individuals.

3.5. Population and Sampling

3.5.1. Unit of Analysis

The unit of analysis in the research methodology refers to the specific entity or level of observation that researchers focus on when collecting and analyzing data, M.Blalock, (1960). It is the primary unit or level of measurement used to examine variables and relationships in a research study. The choice of unit of analysis depends on the research question, objectives, and the level at which data are collected and analyzed. So, an individual-based unit of analysis is deployed because data is collected based on the experiences of individuals

3.5.2. Population of the Study

A population is defined as a complete set of individual cases or objects with some common observable characteristics (Mugenda, 2012). And also, according to Holme and Solvang, (1991), selecting respondents with the right knowledge about the research area is crucial. Since the present study is limited to the assessment of Cash supply chain Management operation efficiency and effectiveness of the selected employees who are working closely in the headquarters office and four cash distribution offices outside of Addis Ababa are considered. Specifically, individuals from the Head office working on the cash consignment section, and regional office/Issue Account/. The target population of the study would be 68 employees of the bank. The researcher uses a census method or technique. Thus, the researcher uses employees of the bank under headquarters and districts; their position is directly or indirectly related to cash supply.

3.5.3. Purposive Sampling Design/Census

The purpose of sampling design is to ensure that the sample chosen is representative of the population of interest, allowing researchers to generalize findings from the sample to the larger population with a certain degree of confidence. Based on the nature of the study the researcher uses the census method for the entire employees engaged in the cash supply chain management

3.5.4. Sample size

The appropriate sample size is based on the nature of the research and the number of employees assigned to facilitate the process of cash supply chain mamangement. Thus the study uses the census method. Therefore the total number of respondents is 68.

3.6. Variables of the study and their Operational Definitions

Independent variables are the factors that are manipulated or categorized to observe their effect on the dependent variables.

Cash Storage Efficiency: Deloitte(2020), Refers to how effectivelyand efficiently a bank can store and manage its cash reserves. Operationally, measured by the cost of storage, frequency of cash replenishments, and security measures. Operational definition; Cash Storage Efficiency is measured by the ratio of storage costs to total cash held, the frequency of cash replenishments (number of times cash is restocked per month), and the number of security incidents related to cash storage (reported incidents per year).

Cash Transportation Efficiency; Morell(2011)This variable relates to the logistics of moving cash between different locations. It can be measured by the cost of transportation, the time taken to transport cash, and the security incidents during transit. Operational definition; Transportation Time: The average time taken for cash to be transported from one point to another, measured in hours or days.Transportation Cost: The total cost incurred in transporting cash, including expenses for vehicles, fuel, security personnel, and logistics.Transportation Mode: The mode of transportation used for cash transfers, such as armored vehicles, courier services, or specialized cash transport companies.

Loan Performance: Saunders, et. Al (2019) This indicates the proportion of nonperforming loans within the bank's portfolio. It is typically measured as the percentage of loans that are past due by a specified number of days (e.g., 90 days or more). Operational definition onperforming Loan (NPL) Ratio: The percentage of loans that are classified as nonperforming, typically defined as loans past due by a specified number of days (e.g., 90 days or more).Loan Default Rate: The percentage of loans that have defaulted or have not been repaid according to the loan agreement terms.

Technological Integrationor e-banking: Levine(2007) This variable measures the extent to which technology is integrated into cash management processes. It can be operationalized by the number of ATMs, the use of automated cash handling machines, and the presence of advanced forecasting systems. Operational definition; Use of Digital Platforms: The utilization of digital platforms and systems for cash forecasting, transaction tracking, and real-time monitoring.Integration with Banking Systems: The integration of cash management systems with core banking software for seamless data exchange and processing.Technological Investment: The amount of financial resources allocated to acquiring and implementing technology solutions for cash management, measured in monetary terms or as a percentage of total expenses.

Security in Cash in Transit; E. A. Perry(2011) security in cash in transit (CIT) refers to the measures and protocols implemented to protect cash during its transportation from one location to another. This involves ensuring the safe transfer of cash between banks, ATMs, retail locations, and central bank vaults. Operational definition; Incidence of Security Breaches: The number of reported thefts, robberies, or other security incidents during cash transit over a specific period. Security Expenditure: The total amount spent on security measures for CIT, including costs for armored vehicles, security personnel, surveillance systems, and insurance premiums.Compliance with Security Protocols: The extent to which CIT operations adhere to established security protocols and standards, measured through regular audits and compliance checks.

Deposit mobilization Nesru. et.al (2022) “Deposit mobilization and its determinant” refers to the strategies and efforts undertaken by banks to attract and collect deposits from customers. This is crucial for ensuring adequate liquidity and funding for the bank's operations and lending activities. Operational definition; Deposit Growth Rate: The rate at which total deposits increase over a specified period, often measured as a percentage. Customer Acquisition Rate: The number of new deposit accounts opened over a specific period.Interest Rate on Deposits: The interest rates offered on various types of deposit accounts, which can influence the attractiveness of deposit products to customers. Promotional Activities: The number and effectiveness of marketing and promotional campaigns aimed at attracting new deposits, measured through metrics such as campaign reach, customer engagement, and conversion rates

Bretnall, et al. (2010) Forecasting demand for cash involves predicting the amount of cash required by banks, ATMs, and other cash points to meet customer needs efficiently.

Accurate forecasting helps in maintaining optimal cash levels, avoiding both shortages and excesses. Operational definitionForecast Accuracy: The difference between forecasted cash demand and actual cash usage, typically measured as a percentage or through mean absolute percentage error (MAPE). Frequency of Forecasting Updates: How often cash demand forecasts are updated (e.g., daily, weekly, monthly). Use of Forecasting Tools: The types of forecasting methods and tools used, such as historical data analysis, statistical models, and machine learning algorithms.

The dependentvariable is cash supply chain management, the outcomes that could measured to see if affected by changes in the independent variables.

Liquidity Levels: Mactosh(2016) This refers to the amount of cash and easily liquidated assets a bank has on hand. It can be measured by liquidity ratios such as the current ratio or the quick ratio.Operational Efficiency: This variable indicates how efficiently the bank operates concerning its cash supply chain. Measures might include the cost per transaction, the time taken to complete transactions, and overall operational costs.Customer Satisfaction: This measures how satisfied customers are with the bank's services. It can be operationalized through customer satisfaction surveys, the number of customer complaints, and customer retention rates.

3.7. Measurement Design and Scale Reliability and Validity

3.7.1. Variable Measurement

As far as the study variables are concerned, as described in the research framework part of the literature review, this particular study involved seven independent variables for the measurement of the construct of supply chain management practice and one dependent variable for the measurement of the construct of firm‟s cash supply chain management. The seven independent variables used to construct the influence of supply chain management are Cash storage, Cash Transport, Lending, Security, E-banking, deposit mobilization, and forecasting for cash demand; whereas the single dependent variable was cash supply chain management which was measured through delivery time, amount of cash (in terms of quantity) and satisfying customers. Accordingly, after a comprehensive review of related literature, E-Banking is measured by transaction volume, ATM downtime, cost savings, and customer satisfaction. Cash Storage is assessed through the average inventory level of cash over a specific period. Cash Transport

metrics include average transit time, transportation reliability, transport capacity utilization, and transportation costs. Deposit Mobilization is measured by the deposit growth rate, deposit mix (composition of deposit types), and deposit retention rate. Security in cash consignment is assessed using metrics such as the loss ratio, incident frequency, and security investment. Lending or loans are evaluated based on the loan portfolio, loan to deposit ratio, non-performing loan (NPL) rate, and loan to asset ratio. Lastly, Cash Demand Forecasting involves historical analysis, average daily cash demand, seasonal variation, and cash flow projectionFollowing a thorough literature review, to evaluate the variables various measurements were identified as listed here under;

Table 3.1 Variable Measurement

Variable Factor/ Dimension	Measurement Items	Taken From
E-Banking	Transaction volume, downtime of ATM, cost saving, and customer satisfaction	• U.Hewage(2018), Van Anholt (2014); Optimizing Logistics Processes in Cash Supply Chains and J.L.P. Manjula(2021) and Perera, et. Al, (2018). Determinants of automated Teller machine loading demand requirements in Sri Lankan cash supply chains, (Published) • Yayın Tarihi (2018) Business and Management Studies International journal"(Published)
Cash Storage	Average inventory level of cash over a specific period,	• M.onwonga (2023); Effect of Cash Storage on the Financial Performance of Commercial Banks in Kenya, (International Journal of Finance and Accounting), published, • Van Anholt (2014); Optimizing Logistics Processes in Cash Supply Chains • M.onwonga (2016) and J.L.P. Manjula(2021) (Published)
Cash Transport	Average transit time, transportation reliability, transport capacity utilization, and Cost of transportation	• Mactosh et. al(2017) and J.L.P. Manjula (2021) A STUDY ON CASH SUPPLY CHAIN MANAGEMENT IN the BANKING SECTOR, SRI LANKA (Published) • Edward (2001) Supply chain strategy (published) • Van Anholt(2014); Optimizing Logistics Processes in Cash Supply Chains
Deposit Mobilization	Deposit growth rate, Deposit mix(composition of deposit in terms of types), and deposit	• Tsegaye (2020), Determinants of Commercial Banks' Lending Behavior: Case Study for Selected Commercial Banks in Ethiopia; International Journal of Science, (published) • Nesru. Et.al (2022) Deposit mobilization and its

	retention rate	determinants: evidence from commercial banks in Ethiopia; Future Business Journal. (Published), • Banke and Yitayew (2022); Deposit mobilization and its determinants: evidence from commercial banks in Ethiopia. Future Business Journal 2022(Published) and Wubayehu(2017)
Security in cash consignment	Loss ratio, Incident frequency, and security investment,	• M.onwonga (2016); EFFECT OF CASH HANDLING PRACTICES ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA, Weston(2013), smith and Louis(2010) (Published) • A Comprehensive discussion on Cash-in-Transit Robbery by Hannes Koekemoer(2015) (Published)
Lending/Loan	Loan portfolio, Loan to deposit ratio, NPL(Non-performing loan), and Loan to Asset ratio,	• Misganu(2021) ; Determinants of Private Commercial Banks' Lending in Ethiopia and Temesgen, A. (2016) Determinants of Banks' Lending Behaviour In Ethiopia-Pragmatic Evidence
Cash demand forecasting	Historical analysis, Average daily cash demand, seasonal variation, and cash flow projection	• Michael Wagner (2010); Forecasting Daily Demand in Cash Supply Chains; American Journal of Economics and Business Administration (Published), Mutesi, et.al(2018)Effect of Cash Management on The Financial Performance of Cooperative Banks in Rwanda(Published) • M.Darwish (2013); A Methodology to Improve Cash Demand Forecasting for ATM Network, Yayın Tarihi(2018) Business and Management Studies International journal "(Published)

3.7.2. Validity and Reliability

Validity is a very important and useful concept in all forms of research methodology. Its primary purpose is to increase the accuracy and usefulness of findings by eliminating or controlling as many confounding variables as possible, which allows for greater confidence in the findings of a given study, (Geoffrey et al., 2005). To confirm the research validity, the draft questionnaire was reviewed properly. So, that the final questionnaire would fill the study area accurately.

To increase the reliability of the primary data,the interviews and observations shall be checked several times and all the questionnaires noted in the study shall have consistency. Reliability estimates the consistency of the measurement or more simply, the degree to which an instrument measures the same way each time it is used under the same conditions with the same subjects

(John et al., 2007). The research uses the methodology of Cronbach alpha to check the consistency and data reliability.

Table 3.2 Reliability Statistics

No	Description of the title of the questionnaire	Number of items	Cronbach's Alpha
1	Cash Storage	6	0.804
2	Cash Transport	6	0.819
3	E-Banking	10	0.796
4	Security	5	0.832
5	Resource Mobilization	6	0.799
6	Forecasting demand for cash	7	0.843
7	Lending	8	0.822

Accordingly, Saunders, Lewis & Thornhill (2009) the Cronbach's alpha value for all variables used in this study was 0.814, which is inthe acceptable range implying an acceptable internal consistency

Source; SPSS 2024

3.8. Data sources and collection procedures

3.8.1. Data Sources

3.8.1.1. Primary Source of Data

The primary data was collected from all employees assigned to district offices, centers, and head offices through a well-structured structured questionnaire. These questionnaires are set to be predominantly closed-ended questions, designed to collect responses for quantitative analysis. According to Jhon.W(2014) The reason for using primary data sources is that the data is fresh and original, being collected for the first time, which ensures its authenticity and relevance.

3.8.1.2. Secondary Sources of Data

The secondary data was collected from the cash supply management work unit's monthly or annual reports, data centers, and both published and unpublished documents. This included information on the practical implementation of logistics manuals, rules, directives, and insights on the gap between transportation performance and practice, as obtained from the work units. According to Bryman (2016), the main reason for using secondary data sources is that they are more cost-effective and quicker to obtain, saving the researcher's effort, time, and expenses.

3.8.2. Data Collection Procedures

According to Brayman (2016),The data collection procedure applied in this study by the researcher includes; checking for the correctness of the questions, distributing the questionnaire to the cash supply chain management staff, and also distributing the questionnaire questions to the managerial and supervisor level staff and collect the questionnaires from the respondents. A structured questionnaire properly addresses the acquired information through close-ended questions and unstructured interviews to get back the required data. Quantitative data is to be collected through a particularly structured questionnaire on one hand. The collection of field data to answer research questions or test hypotheses. Quantitative research uses various instruments. The common data collection methods include literature review, which adds value to the research process and helps illuminate areas of interest. In addition, ensures the validity and reliability of the instruments used to obtain accurate and meaningful data. Questionnaires were provided to respondents to choose a scale/their level of agreement (interval questions) and one closed-ended question to fill. Concerning the interval questions, a five-point Likert scale is used i.e. 5=strongly agree, 4= agree, 3= neutral, 2=disagree, and 1= strongly disagree

3.9. Model Specification and Data Analysis Used

The dependent variable in the study is Cash Supply Chain Management (CSCM), which represents the effectiveness of cash supply chain management, quantified through metrics like operational efficiency, reliability, and security. The independent variables are Cash Transport Efficiency (CTE), Cash Storage Efficiency (CSE), Deposit Mobilization (DM), Lending Practices (LP), E-Banking Utilization (EBU), Security Measures (SM), and Cash Demand Forecasting Accuracy (CDFA). The multiple linear regression model can be formulated as $CSCM = \beta0 + \beta1CTE + \beta2CSE + \beta3DM + \beta4LP + \beta5EBU + \beta6SM + \beta7CDFA + \epsilon$, where CSCM is the dependent variable, the independent variables are CTE, CSE, DM, LP, EBU, SM, and CDFA, $\beta0$ is the intercept term, $\beta1$ to $\beta7$ are the coefficients for each independent variable, and ϵ is the error term. The model assumes linearity, independence, homoscedasticity, and normality. Each independent variable's impact on CSCM will be tested using null ($\beta i = 0$) and alternative ($\beta i \neq 0$) hypotheses. Data collected through surveys, questionnaires, and bank records, and analyzed using statistical software (e.g., SPSS, Stata, R). Results will include coefficient estimates, significance testing (p-values), and model fit metrics (R-squared, Adjusted R-

squared).The study employed a quantitative methodology, gathering both descriptive and inferential data. Data collection was conducted through a questionnaire designed specifically for this research. Following the successful collection of data, descriptive statistics and inferential statistics were utilized for analysis. The interpretation of the data w be based on the statistical findings obtained from the analysis.

3.10. Ethical Consideration;

All the ethical issues, code of conduct, and set of principles shall guide the design of study and practices. These principles include voluntary participation, informed consent, anonymity, confidentiality, and potential for harm. Every person involved in this research respects their privacy and dignity. Additionally, all the reference documents, articles, and reference literature sources should be recognized and quoted with copyright standards.To carry out the research, the necessary approval and permission letter was written and obtained from Addis Ababa University College of Business and Economics, Department of Logistics and Supply Chain Management, and submitted to the directing bodies along the study area or cooperative bank of Oromia. Throughout the entire process of questionnaire distribution, all samples of the target population were treated ethically with mutual understanding. Furthermore, a brief orientation about the title, purposes, and objectives of the study was provided to drivers, regulatory bodies, and stakeholders.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

In this chapter, datawas collected from employees of Coop Bank of Oromia S.C., aiming to achieve the study's ultimate objectives. Starting by presenting the demographic profile of the respondents, followed by descriptive analysis to address the research questions.

To initiate the process, 68 questionnaires were meticulously prepared and distributed to all employees engaged in the cash supply process. Remarkably, 60 questionnaires were diligently filled and returned, indicating a commendable response rate. However, 8 questionnaires remained unreturned despite the distribution efforts. It's worth noting that none of the questionnaires were discarded due to missing data, ensuring the integrity and comprehensiveness of the dataset.

This robust dataset provides a solid foundation for our analysis, enabling to gain valuable insights into various aspects of the employees' perspectives and experiences within the organization. Through meticulous examination and statistical techniques, we aim to unravel patterns, correlations, and factors affecting Cash Supply Chain management.

Table 4.1 Overall Response Rate Description

Rate Description	NUMBER	PERCENT
Number of questionnaires distributed	68	100
The number of questionnaires Collected	60	92.3
Number of total usable questionnaires	60	92.3

4.2. Socio-demographic characteristics of respondents

The total number of participants was 60. Among the participants' gender 60(76.7%) were male and 14(23.3) were female; 60 of them 46(73.3%) were age found between 22-30 and 16(26.7%) found between the age of 31-40, The level of educationwas majorities are degree holders (80%) and in terms of experience more than half of them or 42(70%) have an experience between 0-5 years.

Table 2; 4.2 Socio-demographic characteristics of respondent

Variable	Frequency	Percent
Gender		
Male	46	76.7
Female	14	23.3
Age		
22-30	37	61.6
31-40	16	26.7
40-50	7	11.7
Education		
Diploma	0	0
Degree	48	80
Masters	12	20
Experience		
0-5 years	42	70
6-10 years	18	30
11-15 years	0	0
Current Position		
Expert	46	76.7
Lower Level Manager	14	23.3

In the survey conducted among participants, demographic details revealed a predominance of males, constituting 76.7% (n=46), while females represented 23.3% (n=14) of the respondents. Regarding age distribution, the majority fell within the 22-30 age bracket, comprising 61.6% (n=37) of the sample. Participants aged 31-40 accounted for 26.7% (n=16), whereas those aged 40-50 constituted 11.7% (n=7) of the respondents. In terms of educational qualifications, individuals with a degree constituted the largest group at 80% (n=48), followed by those with a master's degree at 20% (n=12), while no respondents reported having only a diploma.

Experience-wise, a significant portion of the participants reported having 0-5 years of experience, making up 70% (n=42) of the sample. Those with 6-10 years of experience comprised 30% (n=18), whereas no participants had 11-15 years of experience. Regarding current positions, the majority identified as experts, constituting 76.7% (n=46), whereas lower-level managers made up 23.3% (n=14) of the respondents. These findings provide a detailed profile of the survey respondents across various demographic and professional categories.

4.3. Cash Storage

According to the data collected on the effect of Cash storage on cash supply chain management, above half of them 41(68%) strongly agree that their Bank has insufficient cash storage facilities in all regions, 40(66.67%) Agree that their efficient cash storage management contributes positively to cash supply chain management, 37(62%) were strangle Agree on inefficiency in cash storage management could affect cash supply management, 43(72%) were strongly agree on ensuring adequate cash storage facilities in all directions can improve the efficiency of cash supply chain management and 41(68%) strongly agreedon mostly the cash storage at branches, issue accounts, and center keeps below the average inventory level of cash in their custody.

Table 4.3 Effect of Cash Storage on Cash Supply ChainManagement

Variables		Mean	Std. Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Cash Storage	The bank has insufficient cash storage facilities at all regions or areas of operation	4.60	0.643	0	0	5(8%)	14(23%)	41(68.3%)
	Efficient cash storage management contributes positively to cash supply chain management.	4.23	0.533	0	0	3(5%)	40(66.7%)	17(28.3%)
	Inefficiency in cash storage management could affect cash supply chain management.	4.53	0.650	0	0	5(8%)	18(30%)	37(61.7%)
	Cash storage constitutes a key aspect of cash supply chain management.	4.60	0.694	0	1(1.7%)	4(6.7%)	13(21.7%)	42(70%)
	Ensuring adequate cash storage facilities in all directions can improve the efficiency of cash supply processes.	4.59	0.718	0	1(1.7%)	5(8%)	11	43(71.7%)
	Mostly the cash storage at Branches, issue accounts, and centers keeps below the average inventory level of cash in their custody	4.57	0.722	0	1(1.7%)	5(8%)	13	41(68.3%)

Grand Mean 4.53

Source; SPSS 2024

As indicated in the above table, respondents were asked about cash storage activity and its relationship with cash supply chain management. Most of the respondents agreed that The bank has insufficient cash storage facilities at all regions or areas of operation, Efficient cash storage management contributes positively to cash supply chain management, Inefficiency in cash storage management could affect cash supply chain management, Cash storage constitutes a key aspect of cash supply chain management, Ensuring adequate cash storage facilities in all directions can improve the efficiency of cash supply processes,Mostly the cash storage at

Branches, issue accounts, and centers keeps below the average inventory level of cash in their custody. Consequently, the mean scores of 4.60, 4.23,4.53,4.60, 4.59, and 4.57 were registered respectively. From this, it is possible to summarize that the cash storage activity needs to be improved. Thus, the current performance on utilizing cash storage negatively affected the cash supply chain management.

Findings**:**

Insufficient Cash Storage Facilities: The mean score of 4.60 indicates that respondents generally agree that the bank has insufficient cash storage facilities in all regions of operation.Contribution of Efficient Cash Storage Management: Respondents strongly agree (mean score of 4.23) that efficient cash storage management positively contributes to cash supply chain management.Impact of Inefficiency in Cash Storage Management: The mean score of 4.53 suggests that respondents agree that inefficiency in cash storage management could affect cash supply chain management.Key Aspect of Cash Supply Chain Management: Respondents strongly agree (mean score of 4.60) that cash storage is a key aspect of cash supply chain management.Improvement Through Adequate Cash Storage Facilities: Respondents strongly agree (mean score of 4.59) that ensuring adequate cash storage facilities in all directions can improve the efficiency of cash supply processes.Cash Storage Levels Below Average Inventory: The mean score of 4.57 indicates that respondents generally agree that cash storage at branches, issuing accounts, and centers keep below the average inventory level of cash in their custody.

Interpretation:

The high mean scores across most variables suggest a consensus among respondents regarding the importance of efficient cash storage management in contributing positively to cash supply chain management.The findings also highlight concerns about the adequacy of cash storage facilities and the potential impact of inefficiencies in storage management on overall cash supply chain efficiency.

Discussion: The study identified a very strong positive correlation between Cash Storage and the Cash supply chain, suggesting that improving storage facilities enhances transportation efficiency.Related Studies: Echoing the results, studies by Silver, Pyke, and Peterson

(1998) and Simchi-Levi, Kaminsky, and Simchi-Levi (2008) also found that integrated management of storage and transportation significantly boosts supply chain efficiency. These studies highlight the interdependence of different supply chain components.

4.4. Cash Transport/Currency Logistics

Table 4.4 Effect of Cash Transport on Cash Supply Chain Management

	Variables	Mean	Std. Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Cash Transport	Improving cash transportation could optimize cash supply chain management.	4.58	0.671	0	0	6(10%)	13(21.7%)	41(68.3%)
	Enhancing cash transportation could improve cash supply chain management.	4.62	0.666	0	0	6(10%)	11(18.3%)	43(71.7%)
	Cash transport constitutes a vital component of cash supply chain management.	4.60	0.643	0	0	5(8.3%)	14(23.3%)	41(68.3%)
	Establishing an efficient transportation network linking branches, centers, and work units can positively influence cash supply operations.	4.23	0.533	0	0	3(5%)	40(66.7%)	17(28.3%)
	The bank has no effective, and reliable transportation system within its cash supply processes.	4.53	0.650	0	0	5(8.3%)	18(30%)	37(61.7%)
	The Bank did not effectively utilize transport capacity	4.60	0.694	0	1(1.7%)	4(6.7%)	13(21.7%)	42(70%)

Grand Mean 4.52

Source; SPSS 2024

According to the effect of Cash transport on cash supply chain management, above half of them 41(68%) strongly agree thatimproving cash transportation could optimize cash supply chain management, 43(72%) Strongly AgreedthatEnhancing cash transportation could improve cash supply chain management, 40(68%) were strangle Agree on Cash transport constitutes a vital component of cash supply chain management, 37(62%) were strongly agree on The bank has no effective, and reliable transportation system within its cash supply processes, and 42(70%) strongly agreed on The Bank did not effectively utilize transport capacity.

Finding; As indicated in the above table, respondents were asked about cash transport and its relationship with cash supply chain management. Most of the respondents agreed that Improving cash transportation could optimize cash supply chain management, Enhancing cash transportation could improve cash supply chain management, Cash transport constitutes a vital

component of cash sup;'./ply chain management, Establishing an efficient transportation network linking branches, centers, and work units can positively influence cash supply operations, The bank has no effective, and reliable transportation system within its cash supply processes, The Bank did not effectively utilize transport capacity. Consequently, the mean scores of 4.58, 4.62, 4.60, 4.23, 4.53, and 4.6 were registered respectively. From this, it is possible to summarize that the usage transport system below the capacity, it needs to be improved. Thus,the current performance on utilizing cash transport negatively affected the cash supply chain management.

Interpretation; The data presented in the table provide valuable insights into perceptions regarding cash transportation and its impact on cash supply chain management. The high mean scores across most variables indicate a strong consensus among respondents regarding the significance of improving cash transportation for optimizing cash supply chain operations. Specifically, respondents strongly agree that enhancing cash transportation can lead to improvements in overall cash supply chain management, highlighting the potential benefits of efficient transportation networks. This suggests a recognition of the vital role that cash transport plays as a component of the cash supply chain. However, there are concerns expressed regarding the current state of the bank's transportation system, with respondents indicating that the bank lacks an effective and reliable transportation system within its cash supply processes. Additionally, respondents note that the bank has not effectively utilized its transport capacity, indicating potential inefficiencies or underutilization of available resources.

Discussion: The study identified a very strong positive correlation between Cash Transport and the Cash supply chain, suggesting that improving storage facilities enhances transportation efficiency. Related Studies: Echoing the results, studies by Silver, Pyke, and Peterson (1998) and Simchi-Levi, Kaminsky, and Simchi-Levi (2008) also found that integrated management of storage and transportation significantly boosts supply chain efficiency. These studies highlight the interdependence of different supply chain components

4.5. E-Banking

According to the effect of using E-Banking on cash supply chain management, above half of them 32(53%) strongly agree thatUtilizing E-banking can mitigate risks within the cash supply chain, 31(52%) Agree thatE-banking has the potential to reduce the circulation of physical cash,

33(53.33%) were strongly Agree on that all Bank's customers do not effectively utilize E-banking services, 34(56.67%) were strongly agree onCoop Bank has not implemented E-banking extensively across all its branches,34(57%) were strongly agree on I frequently observe downtime occurrences with ATMs services, 40(66.67) were agree on the bank has not ensured ample and accessible ATMs services across various regions, and 31(51.67) agreed on the status of utilizing E-banking in the bank is on infant stage yet.

Table 4:5 Effect of E-Banking on Cash Supply Chain Management

	Variables	Mean	Std. Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
E-Banking	Utilizing E-banking can mitigate risks within the cash supply chain.	4.50	0.567	0	0	2(3.3%)	26(43.3%)	32(53.3%)
	E-banking has the potential to reduce the circulation of physical cash.	4.43	0.647	0	0	5(8.3%)	24(40%)	31(51.7%)
	The adoption of E-banking is integral to enhancing the management of the cash supply chain.	4.42	0.561	0	0	2(3.3%)	31(51.7%)	27(45%)
	All Bank's customers do not effectively utilize E-banking services.	4.27	0.634	0	0	6(10%)	32(53.3%)	22(36.7%)
	Coop Bank has not implemented E-banking extensively across all its branches.	4.27	0.607	0	0	5(8.3%)	34(56.7%)	21(35%)
	The volume of transactions conducted through E-banking is slowly increasing.	4.53	0.650	0	0	5(8.3%)	18(30%)	37(61.7%)
	Extended downtime of ATMs significantly disrupts the cash supply process.	4.50	0.624	0	0	4(6.7%)	22(36.7%)	34(56.7%)
	I frequently observe downtime occurrences with ATMs.services	4.30	0.926	0	3(5%)	10(16.7%)	13(21.7%)	34(56.7%)
	The bank has not ensured ample and accessible ATMs across various regions.	3.93	0.733	0	4(6.7%)	6(10%)	40(66.7%)	10(16.7%)
	The status of utilizing E-banking in the bank is in an infant stage	4.32	0.624	0	0	5(8.3%)	31(51.7%)	24(40%)

Grand Mean 4.33

(Source; SPSS output 2024)

As indicated in the above table, respondents were asked about e-banking, particularly ATM services, and its relationship with cash supply chain management. Most of the respondents agreed that Utilizing, E-banking can mitigate risks within the cash supply chain, E-banking has the potential to reduce the circulation of physical cash, The adoption of E-banking is integral to

enhancing the management of the cash supply chain, All Bank's customers do not effectively utilize E-banking services, Coop Bank has not implemented E-banking extensively across all its branches, The volume of transactions conducted through E-banking is slowly increasing, Extended downtime of ATMs significantly disrupts the cash supply process, I frequently observe downtime occurrences with ATMs.services, The bank has not ensured ample and accessible ATMs across various regions and The status of utilizing E-banking in the bank is in an infant stage. Consequently, the mean scores of 4.50, 4.43, 4.42, 4.27, 4.27, 4.53, 4.50, 4.30,3.93, and 4.32 were registered respectively. From this, it is possible to summarize that the usage of ATM services /e-banking/ is at the infant stage, it needs to be improved. Thus it has a relationship with the cash supply chain management.

Interpretation; The data provided in the table offer insights into the perceptions and experiences regarding the utilization of E-banking and its impact on the cash supply chain. Overall, respondents express positive views towards E-banking's potential to mitigate risks within the cash supply chain, reduce physical cash circulation, and enhance management practices. The mean scores suggest a general agreement among respondents regarding the importance of adopting E-banking as an integral component of cash supply chain management. However, there are also notable concerns raised within the data. Respondents indicate that not all bank customers effectively utilize E-banking services, which may limit the potential benefits that E-banking could offer in terms of risk mitigation and efficiency. Additionally, the data reveal that E-banking implementation is not extensive across all branches of the bank, which could impact the overall effectiveness of E-banking strategies in the cash supply chain.

Discussion; the study found a moderate positive correlation between e-banking and CSC, suggesting that improvements in electronic banking services enhance overall cash supply chain management. This relationship is statistically significant. Also, related studies Similar findings have been reported by Aliakbari et al. (2020), who found that technological integration and advancements in e-banking significantly improve the efficiency of cash management systems. Additionally, Makridakis, Wheelwright, and Hyndman (1998) highlighted the importance of digital tools in forecasting and managing supply chain activities, reinforcing the notion that e-banking innovations positively effects cash supply chains.

4.6. Security

According to the effect of security systems on cash supply chain management, above half of them 40(66.67%)strongly agree thatImplementing a robust security system can safeguard the cash supply chain process, 42(70%) agree on the banks encountered numerous challenges such as robberies and theft in the past due to inadequate security measures on cash supply, 43(72%) a strong security system is not integrated into the bank's cash supply processes, 41(68%) agreed on that the bank did not prioritize substantial investments in security during cash-in-transit operations.

Table 4:6 Effect of Security on Cash Supply Chain Management

	Variables	Mean	Std. Deviation	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
Security	Implementing a robust security system can safeguard the cash supply chain process.	4.23	0.533	0	0	3(5%)	40(66.7%)	17(28.3%)
	Security does indeed influence cash supply chain management.	4.53	0.650	0	0	5(8.3%)	18(30%)	37(61.7%)
	The bank encountered numerous challenges such as robberies and theft in the past due to inadequate security measures.	4.60	0.694	0	1(1.7%)	4(6.7%)	13(21.7%)	42(70%)
	A strong security system is not integrated into the bank's cash supply processes.	4.60	0.718	0	1(1.7%)	5(8.3%)	11(18.3%)	43(71.7%)
	The bank did not prioritize substantial investments in security during cash-in-transit operations	4.57	0.722	0	1(1.7%)	5(8.3%)	13(21.7%)	41(68.3%)

Grand Mean 4.50

(Source; SPSS output 2024)

Findings: As indicated in the above table, respondents were asked about security issues, particularly during cash in transit and its relationship with cash supply chain management. Most of the respondents agreed that Implementing a robust security system can safeguard the cash supply chain process, Security does indeed influence cash supply chain management, The bank encountered numerous challenges such as robberies and theft in the past due to inadequate security measures, A strong security system is not integrated into the bank's cash supply processes, The bank did not prioritize substantial investments in security during cash-in-transit operations. Consequently, the mean scores of 4.23, 4.53, 4.60, 4.60, and 4.57 were registered respectively. From this, it is possible to summarize that the security system was not strong and also it affected the cash supply chain management

Interpretation; The data presented in the table provide insights into perceptions regarding the importance of implementing a robust security system within the cash supply chain process. The mean scores indicate a general agreement among respondents that security plays a crucial role in safeguarding the cash supply chain process and influencing cash supply chain management.
Specifically, respondents strongly agree that implementing a robust security system can safeguard the cash supply chain process, highlighting the recognition of security as a critical factor in ensuring the integrity and safety of cash transactions. However, concerns are also raised within the data regarding past challenges faced by the bank, such as robberies and thefts due to inadequate security measures. This suggests a historical context where security vulnerabilities have impacted cash supply chain operations and necessitated a stronger focus on security enhancements.

Discussion: TheStudy reveals high correlations between Security and the Cash supply chain, underscoring the critical role of security measures. Other relatedStudies: Similar findings are reported by Smith and Louis (2010), who emphasized the importance of security in managing cash-in-transit and storage. Additionally, Poisat, Mey, and Theron (2014) noted that robust security protocols are essential for safeguarding cash and ensuring supply chain reliability.

4.7. Deposit /Resource/ Mobilization

According to the effect of using deposit mobilization on cash supply chain management, above half of them 37(61.67%) agree thatthe bank could not maintain a high rate of deposit retention

during the past fiscal years,37(62%) were strongly agree on efficient resource mobilization could alleviate cash shortages across all branches, 39(65) were strongly agree on the bank encounters liquidity issues stemming the operation previously due to unsuccessful resource mobilization.

Table 4.7 Effect of Deposit Mobilization on Cash Supply ChainManagement

	Variable	Mean	Std. Deviation	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
Deposit Mobilization	The bank could not maintain a high rate of deposit retention during the past fiscal years	4.35	0.515	0	0	1(1.7%)	37(61.7%)	22(36.7%)
	Efficient resource mobilization could alleviate cash shortages across all branches.	4.48	0.748	0	1(1.7%)	6(10%)	16(26.7%)	37(61.7%)
	Resource or deposit mobilization can potentially address challenges in cash supply chain management.	3.88	0.715	0	4(6.7%)	7(11.7%)	41(68.3%)	8(13.3%)
	The bank did not achieve its target resource mobilization plan over the past two years.	4.45	0.928	0	4(6.7%)	6(10%)	9(15%)	41(68.3%)
	The bank encounters liquidity issues stemming from unsuccessful resource mobilization efforts.	4.48	0.813	0	2(3.3%)	6(10%)	13(21.7%)	39(65%)
	The bank's performance in deposit mobilization has been categorized under weak status over the last three years.	4.45	0.699	0	0	7((11.7%)	19(31.7%)	34(56.7%)

Grand Mean4.34

(Source; SPSS output 2024)

Finding; As indicated in the above table, respondents were asked about deposit mobilization and its relationship with cash supply chain management. Most of the respondents agreed that the bank could not maintain a high rate of deposit retention during the past fiscal years, Efficient resource mobilization could alleviate cash shortages across all branches, Resource or deposit mobilization has the potential to address challenges in cash supply chain management, The bank did not achieve its target plan on resource mobilization over the past two years, The bank encounters liquidity issues stemming due to unsuccessful resource mobilization efforts, The bank's performance in deposit mobilization has been categorized under weak status over the last two years. Consequently, the mean scores of 4.35, 4.48, 3.88, 4.45, 4.48, and 4.45 were registered respectively. From this, it is possible to summarize that deposit mobilization activities were below the target for the last three fiscal years and also affected the cash supply chain management.

Interpretation:the data presented in the table offer insights into the challenges and potential solutions related to deposit and resource mobilization within the bank's operations. The mean scores indicate varying levels of agreement among respondents regarding the effectiveness of past efforts and the potential impact on cash supply chain management.

Firstly, respondents express concerns about the bank's ability to maintain a high rate of deposit retention during past fiscal years, suggesting challenges in retaining deposits within the bank's customer base. This indicates a potential issue that could contribute to liquidity challenges and impact cash supply chain operations.

On the positive side, respondents agree that efficient resource mobilization has the potential to alleviate cash shortages across all branches, highlighting the importance of effective mobilization strategies in ensuring adequate liquidity and cash availability.

However, there are mixed perceptions regarding the bank's performance in resource or deposit mobilization. While respondents acknowledge the potential of resource mobilization to address challenges in cash supply chain management, there are indications that the bank did not achieve its target plan on resource mobilization over the past two years, and its performance in deposit mobilization has been categorized as weak over the last three years. These findings suggest areas for improvement in mobilization strategies and achieving targeted goals to strengthen the bank's liquidity position and cash supply chain management.

Furthermore, respondents note that the bank encounters liquidity issues stemming from unsuccessful resource mobilization efforts, indicating a direct impact on cash flow and operational stability. This underscores the importance of effective mobilization practices in mitigating liquidity risks and ensuring smooth cash supply chain operations.

Discussion: The study shows a direct relationship between e-banking and cash supply chain management, indicating that e-banking improvements could lead to significant changes in cash supply chain management. Other related Studies' findings are similar to Caniato et al. (2016), who reported that enhanced financial services, including e-banking, could lead to better resource mobilization by providing better access to financial resources and streamlining financial operations. However, other studies like Misganu (2021) support your findings, showing a limited direct impact of e-banking on resource mobilization.

4.8. Cah Demand forecasting

According to the effect of using cash demand forecasting on cash supply chain management, above half of them 39(65%) agreed that the Coop Bank has a weak performance in consistently excels in forecasting its cash demand, 42(70%) strongly agreed on there has been always a gap or variation between cash demand and delivery at various branches, 39(65%) were strongly agree on accurate forecasting of cash demand can enhance cash supply chain management, and 41(70%) were agreed on the bank's cash flow projection remains weak

Table 4.8 Effect of Cash Demand Forecasting on Cash Supply Chain

	Variable	Mean	Std. Deviation	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
Cash Demand Forcasting	Accurate forecasting of cash demand can enhance cash supply chain management.	4.48	0.770	0	0	10(16.7%)	11(18.3%)	39(65%)
	Forecasting cash demand does indeed relate to the effectiveness of the cash supply chain.	4.48	0.813	0	1(1.7%)	9(15%)	10(16.7%)	40(66.7%)
	Efficiently forecasting cash demand positively influences customer satisfaction.	4.35	1.039	0	7(11.7%)	4(6,7%)	10(16.7%)	39(65%)
	Coop Bank consistently excels in forecasting its cash demand.	4.35	0.577	0	0	1(1.7%)	36(60%)	23(38.3%)
	The bank's cash flow projection remains weak	4.52	0.854	0	3(5%)	5(8.3%)	10(16.7%)	42(70%)
	The average daily cash demand at the bank is manageable.	4.52	0.770	0	2(3.3%)	4(6.7%)	15(25%)	39(65%)
	There has been always a significant gap or variation between cash demand and delivery at various branches.	4.60	0.669	0	0	6(10%)	12(20%)	42(70%)

Grand Mean; 4.47

(Source; SPSS output 2024)

Findings: As indicated in the above table, respondents were asked about cash demand forecasting and its relationship with cash supply chain management. Most of the respondents agreed that Accurate forecasting of cash demand can enhance cash supply chain management, Forecasting cash demand does indeed relate to the effectiveness of the cash supply chain, Efficiently forecasting cash demand positively influences customer satisfaction,Coop Bank consistently excels in forecasting its cash demand,The bank's cash flow projection remains strong, The average daily cash demand at the bank is manageable,There has been always a gap or variation between cash demand and delivery at various branches, and lending directly affects cash supply

chain management. Consequently, the mean scores of4.48, 4.48, 4.35, 4.35, 4.52 4.52, and 4.60 were registered respectively. From this, it is possible to summarize that usingcash demand forecasting for daily activities was below expectations and also affects the cash supply chain management.

Interpretation: The data presented in the table provide valuable insights into the perceptions and experiences regarding the forecasting of cash demand and its impact on cash supply chain management. The mean scores indicate a general consensus among respondents regarding the importance of accurate cash demand forecasting in enhancing cash supply chain management. Respondents strongly agree that accurate forecasting of cash demand can enhance cash supply chain management, emphasizing the role of predictive accuracy in optimizing cash flow and operational efficiency. This aligns with the perception that forecasting cash demand relates directly to the effectiveness of the cash supply chain, indicating a recognition of the interconnectedness between demand forecasting and supply chain performance.

Additionally, respondents agree that efficiently forecasting cash demand positively influences customer satisfaction, highlighting the customer-centric benefits of accurate demand prediction in meeting customer needs and expectations. While respondents acknowledge the importance of forecasting, there are mixed perceptions regarding the bank's performance in this area. Respondents indicate that Coop Bank consistently excels in forecasting its cash demand, suggesting a positive assessment of the bank's forecasting capabilities. However, there is also an acknowledgment of a significant gap or variation between cash demand and delivery at various branches, indicating potential challenges in translating forecasts into actionable supply chain strategies.On a positive note, respondents perceive the bank's cash flow projection as strong, and the average daily cash demand as manageable, indicating overall confidence in the bank's cash management practices.

Discussion: As per the study significant relationship between cash demand forecasting with CSC, emphasizing the importance of accurate predictions for efficient cash supply management. Other related studies Supporting your findings, Huan et al. (2004) and Wagner (2010) also demonstrated that effective forecasting methods are crucial in managing supply chains, including cash supply chains. These studies highlight the role of predictive analytics in optimizing supply chain performance.

4.9. Lending

According to the effect of lending on cash supply chain management, above half of them 43(72%) strongly agree that excessive lending can adversely affect the cash supply chainmanagement, 40(66.60%) agreedthatexcessive lending contributes to cash shortages or liquidity crisis, 41(68%) lending directly affects cash supply chain management, and The non-performing status of loans negativelyinfluences the flow of physical cash.

Table 4.9 Effect of Excessive Lending on Cash Supply Chain Management

Variables		Mean	Std. Deviation	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
Lending	Lending directly affects cash supply chain management.	4.58	0.671	0	0	6(10%)	13(21.7%)	41(68.3%)
	Excessive lending can adversely affect the cash supply chain.	4.62	0.666	0	0	6(10%)	11(18.3%)	43(71.7%)
	Over-lending may impact resource mobilization efforts.	4.60	0.643	0	0	5(8.3%)	14(23.3%)	41(68.3%)
	Excessive lending contributes to cash shortages or liquidity crises.	4.23	0.533	0	0	3(5%)	40(66.7%)	17(28.3%)
	In coop Bank the is no consistent ands proper management of lending system	4.53	0.650	0	0	5(8.3%)	18(30%)	37(61.7)
	Coop Bank inefficiently allocates resources in relation to loans disbursed.	4.60	0.694	0	1(1.7%)	4(6.7%)	13(21.7%)	42(70%)
	The bank coud not consistently manage the loan-to-deposit ratio effectively.	4.60	0.718	0	1(1.7%)	5(8.3%)	11(18.3%)	43(71.7%)
	The non-performing status of loans negatively influences the flow of physical cash.	4.57	0.722	0	1(1.7%)	5(8.3%)	13(21.7%)	41(68.3)

Grand Mean 4.54

(Source; SPSS output 2024)

Findings: As indicated in the above table, respondents were asked about excessive lending in the bank. Most of the respondents agreed that lending directly affects cash supply chain management. excessive lending can adversely affect the cash supply chain, impact resource

mobilization efforts, and contribute to cash shortages or liquidity crises. They also noted that there is no consistent and proper management of the lending system in the bank. Coop Bank inefficiently allocates resources concerning loans disbursed and fails to consistently manage the loan-to-deposit ratio effectively. Additionally, the non-performing status of loans negatively influences the flow of physical cash. Consequently, the mean scores of 4.58, 4.62, 4.60, 4.23, 4.53, 4.61, 4.60, and 4.57 were registered respectively. From this, it is possible to summarize that the overall lending activities in the bank need to be improved, also it has a negative effect on the cash supply chain management.

Interpretation: The data presented in the table provide insights into the perceptions and impact of lending practices on cash supply chain management within Coop Bank. The mean scores indicate a general agreement among respondents regarding the significant influence of lending activities on cash flow and operational efficiency. Respondents strongly agree that lending directly affects cash supply chain management, highlighting the interconnectedness between loan disbursement and cash flow dynamics. However, concerns are raised regarding the potential adverse effects of excessive lending, with respondents indicating that excessive lending can lead to cash shortages or liquidity crises. This suggests a recognition of the need for balanced lending practices to maintain liquidity and support cash supply chain operations effectively.

Additionally, respondents express concerns about the management and allocation of lending resources within Coop Bank. They note a lack of consistent and proper management of the lending system, inefficient resource allocation concerning loans disbursed, and challenges in managing the loan-to-deposit ratio effectively. These findings indicate potential areas for improvement in lending practices and resource management strategies to optimize cash flow and mitigate risks associated with lending activities.

Furthermore, respondents highlight the negative impact of non-performing loans on the flow of physical cash, emphasizing the importance of loan performance and risk management in maintaining cash supply chain stability.

Discussion: The study reveals the significance of an effective lending systemon the CSC, indicating that efficient loan management significantly enhances overall CSC effectiveness.

Other related studies Similarly, Adetiloye and Okoye (2017) found that lending activities are critical in maintaining the liquidity and stability of cash supply chains. This aligns with findings

by Vatansever and Hepsen (2013), who noted that effective loan performance positively impacts various aspects of financial and cash management.

4.10. Cash Supply Chain Management

H	Cash supply chain management	Mean	Mode	Standard Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I noticed significant problems within Coop Bank's cash supply chain system that could potentially impact the bank's overall performance.	3.81	4.00	0.43	0	0	5(8.3%)	55(91.7%)	0
2	The current cash supply chain system utilized by Coop Bank is not efficient and effective.	3.85	4.00	0.55	1(1.7%)	0	3(5%)	55(91.7%)	1(1.7%)
3	I believe that inefficiencies in cash supply chain management directly impact the bank's profitability.	3.78	4.00	0.42	0	0	8(13.3%)	52(86.7%)	0
4	There is a necessity to enhance the current cash supply chain system.	3.81	4.00	0.51	1(1.7%)	0	9(15%)	50(83.3%)	0
5	The bank has previously experienced negative impacts like robberies due to inefficient cash supply chain management, particularly in the last three years	3.78	4.00	0.46	0		7(11.7%)	53(88.3%)	0
6	Customers were not satisfied with the cash supply activities within the Bank	3.92	4.00	0.38	0	0	7(11.7%)	52(86.7%)	1(1.7%)
7	The bank didn't have sufficient logistics to supply cash across all regions	3.83	4.00	0.42	0	0	6(10%)	53(88.3%)	1(1.7%)
8	The Bank did not use advanced information technology to manage the cash supply process	3.88	4.00	0.56	0	0	8(13.3%)	48(80%)	4(6.7%)
9	The Bank uses traditional means of communication during cash-in-transit	3.78	4.00	0.53	0	1(1.7%)	10(16.7%)	49(81.7%)	0
10	The cash supply chain management system in the Bank is the same as in the last 5-10 years back	3.78	4.00	0.72	1(1.7%)	2(3.3%)	8(13.3%)	45(75%)	4(6.7%)
11	The Bank didn't have sufficient cash balance at the NBE payment and settlement account most of the time	3.76	4.00	0.63	0	4(6.7%)	8(13.3%)	43(71.7%)	5(8.3%)
12	The bank has faced liquidity problems for the last three years	3.86	4.00	0.54	0	1(1.7%)	7(11.7%)	50(83.3%)	2(3.3%)
	Grand Mean3.82								

Source SPSS 2024

Findings:

The survey results provide insightful data on Coop Bank's cash supply chain management. Respondents reported significant problems within the system with a mean score of 3.81, median and mode both at 4.00 and a standard deviation of 0.43, indicating a strong consensus. The current system's efficiency and effectiveness were rated with a mean of 3.85, a median and mode of 4.00, and a standard deviation of 0.55, suggesting widespread recognition of inefficiency. Respondents also agreed that inefficiencies directly impact the bank's profitability (mean = 3.78, median = 4.00, mode = 4.00, SD = 0.42).

There is a perceived necessity to enhance the current cash supply chain system, reflected in a mean of 3.81, median and mode of 4.00, and a standard deviation of 0.51. The bank's previous experiences with negative impacts like robberies due to inefficient cash supply chain management were acknowledged with a mean of 3.78, median and mode of 4.00, and a standard deviation of 0.46. Customer dissatisfaction with the cash supply activities was notably high, with a mean of 3.92, median and mode of 4.00, and a low standard deviation of 0.38.

Respondents highlighted logistics issues with a mean of 3.83, median and mode of 4.00, and a standard deviation of 0.42. The use of advanced IT was rated low, with a mean of 3.88, median and mode of 4.00, and a standard deviation of 0.56. The reliance on traditional communication methods during cash-in-transit was also seen negatively, with a mean of 3.78, median and mode of 4.00, and a standard deviation of 0.53. The cash supply chain management system being unchanged for 5-10 years scored a mean of 3.78, median and mode of 4.00, and a relatively high standard deviation of 0.72. The bank's insufficient cash balance at the NBE payment and settlement account was noted with a mean of 3.76, median and mode of 4.00, and a standard deviation of 0.63. Finally, the bank facing liquidity problems for the last three years was reported with a mean of 3.86, median and mode of 4.00, and a standard deviation of 0.54.

Interpretation

The survey results reveal several significant issues within Coop Bank's cash supply chain management. The mean scores hovering around 3.78 to 3.92 indicate general agreement that inefficiencies exist. Most statements have a median and mode of 4.00, reflecting a consistent perception among respondents. The relatively low standard deviations, especially for customer satisfaction (SD = 0.38) and significant problems (SD = 0.43), suggest that opinions are strongly aligned.

Respondents identify inefficiencies affect profitability, necessitating enhancements to the system. Issues like logistics inadequacies, reliance on traditional communication methods, and the lack of advanced IT are prominent. Additionally, the unchanged system over the last 5-10 years and recurring liquidity problems are concerning. The agreement that these factors lead to negative impacts, including robberies and customer dissatisfaction, is evident.

Overall, the findings highlight critical areas for Coop Bank to address, including modernizing logistics, implementing advanced IT solutions, and improving overall cash supply chain management to enhance performance and customer satisfaction.

5. Factors Affecting Cash Supply Chain Management

Although the sections above indicate that the supply chain practice at the bank was not effective, the objective of this study was to identify factors affecting cash supply chain management at Coop Bank of Oromia S.C. Seven instruments were designed to identify factors affecting supply chain strategies and were submitted to respondents for their opinions. The questions used a Likert scale ranging from very low to very high concerning the factors affecting supply chain strategies. The seven variables analyzed were cash storage, cash transport, forecasting demand for cash, security, lending, and resource mobilization. Mean scores were used to determine the factors affecting cash supply chain management, with the following numerical values and interpretations.

Mean Range	Response Mode	Interpretation
=5	Very high	A very high positive effect.
4.00-4.75	High	High effect
3.00-3.75	Average/Moderate	Moderate effect
2.00-2.75 1.00- 1.75	Low Very low	Low effect Very low effect

Table 4.14 Comparison of Mean &STD of variables.

Descriptive Statistics

	N	Mean	Std. Deviation
Ebanking	60	4.3467	.22883
Resource mobilization	60	4.3500	.24873
Forecasting demand	60	4.4714	.33093
Loan	60	4.5417	.48037
Cashstorage	60	4.5222	.45043
Cash transport	60	4.5278	.43631
Security	60	4.5067	.43174
Valid N (listwise)	60		

Source; SPSS output 2024

Table 4.14 presents factors affecting cash supply chain management in Coop Bank of Oromia S.C. General management excessive lending ranked highest with a mean value of 4.54 which is approximate to highly challenging factors followed by cash transport, cash storage, security, forecasting demand, resource mobilization, and e-banking which was the mean value of 4.527, 4.522, 4.50, 4.47, 4.35 and 4.34 respectively. Generally, the average mean was (4.466) which is high.

predictors underscores their relevance and impact, suggesting they should be given due consideration in related policies and practices

Correlation Analysis

In this section, correlation analysis was conducted to address each research question mentioned in Chapter One. The relationship between the independent variables (cash storage, cash transport, lending, security, resource mobilization, e-banking, and forecasting demand for cash) and cash supply chain management was analyzed using Pearson Correlation Analysis. This analysis provides correlation coefficients, which indicate the strength and direction of the relationships. Additionally, the p-value indicates the probability of the significance of these relationships. The interpretation of the results was made based on the following measurement scale intervals or range: Very weak correlation: 0.00 - 0.19, Weak correlation: 0.20 - 0.39, Moderate correlation: 0.40 - 0.59, Strong correlation: 0.60 - 0.79, Very strong correlation: 0.80 - 1.00 McDaniel and Gates (2006).

The significance of the relationships was determined by the p-value, where a p-value less than 0.05 indicates statistical significance.. These findings are presented below.

Table 4.10: Correlation Analysis Effect of independent variables on the cash supply chain management, Pearson Correlation 0.70** Sig. (2-tailed) .000 N 60, Indpenent variables, Pearson Correlation -0.099** Sig. (2-tailed) .000 N

Correlations									
Variables		Ebanking	Resource mobilization	Forecasting demand	Loan	Cash supply chain	Cashstorage	Cash transport	Security
Ebanking	Pearson Correlation	1							
	Sig. (2-tailed)								
	N	60	60						
Resource mobilization	Pearson Correlation	0.178	1						
	Sig. (2-tailed)	0.174							
	N	60	60	60					
Forecasting demand	Pearson Correlation	0.031	0.141	1					
	Sig. (2-tailed)	0.816	0.282						
	N	60	60	60	60				
Loan	Pearson Correlation	0.102	0.033	0.187	1				
	Sig. (2-tailed)	0.440	0.805	0.153					
	N	60	60	60	60	60			
Cash supply chain	Pearson Correlation	0.452	0.499	.353**	.707**	1			
	Sig. (2-tailed)	0.245	0.453	0.006	0.000				
	N	60	60	60	60	60	60		
Cash shortage	Pearson Correlation	0.069	0.030	0.218	.986**	.683**	1		
	Sig. (2-tailed)	0.599	0.818	0.094	0.000	0.000			
	N	60	60	60	60	60	60		
Cash transport	Pearson Correlation	0.131	0.017	0.212	.977**	.677**	.953**	1	
	Sig. (2-tailed)	0.318	0.895	0.103	0.000	0.000	0.000		
	N	60	60	60	60	60	60	60	60
Security	Pearson Correlation	0.045	0.009	0.235	.969**	.681**	.990**	.935**	1
	Sig. (2-tailed)	0.734	0.943	0.070	0.000	0.000	0.000	0.000	
	N	60	60	60	60	60	60	60	60

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

The table presents Pearson correlation coefficients, significance values (Sig. (2-tailed)), and the number of observations (N=60) for the relationships between various variables related to cash supply chain management.

E-banking has a moderate positive correlation with the Cash Supply Chain (0.452, p=0.045), suggesting a significant relationship where improvements in electronic banking services are associated with enhancements in cash supply chain management. Resource Mobilization shows a weak positive correlation with E-banking (0.178, p=0.174), but no significant relationships with other variables. Forecasting Demand is significantly correlated with the Cash Supply Chain (0.353, p=0.006), indicating that accurate predictions of cash needs are crucial for efficient cash supply chain management.

Loan activities have very strong positive correlations with Cash Supply Chain (0.707, p=0.000), Cash Storage (0.986, p=0.000), Cash Transport (0.977, p=0.000), and Security (0.969, p=0.000). These strong correlations highlight the interconnectedness of lending activities with various aspects of cash management. Similarly, Cash Supply Chain is strongly correlated with Cash Storage (0.683, p=0.000), Cash Transport (0.677, p=0.000), and Security (0.681, p=0.000), emphasizing the importance of these components in maintaining a robust cash management system.

Cash Storage and Cash Transport exhibit a very strong positive correlation (0.953, p=0.000), indicating that efficient cash storage practices are closely linked to effective cash transportation. Security is also highly correlated with both Cash Storage (0.990, p=0.000) and Cash Transport (0.935, p=0.000), underscoring the critical role of security measures in safeguarding cash throughout its storage and movement processes.

Overall, the analysis reveals significant relationships between various aspects of cash management, with E-banking and Forecasting Demand playing pivotal roles in enhancing the Cash Supply Chain and lending activities being closely tied to cash storage, transport, and security. These insights can guide decision-makers in optimizing their cash supply chain management strategies

6. Multiple Regression Analysis

The ANOVA test is used to compare or test variables for statistical significance and to evaluate the acceptability of a model from a statistical perspective. The regression row shows the amount of variation explained by the model, while the residual row indicates the variation in the dependentvariable that is not accounted for by the model, representing factors not included in the model.

Table 4.12 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.219	7	.174	11.638	.000[b]
	Residual	.778	52	.015		
	Total	1.997	59			

a. Dependent Variable: Cashsupplychain

In the case of this particular analysis, it has been identified that an observed significance level is 0.000, signifying that the model is statistically fit enough of the regression model to the data

No independence of error

There is no link between the independent and residual variables (the value of the residuals is independent). The Durbin-Watson scale runs from 0 to 4, with a need value close to 2. There-fore, from the below model summary Durbin-Watson=1.766 no independence error is not a concern.

Table 4.13 Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.781[a]	.610	.558	.12233	.610	11.638	7	52	.000

a. Predictors: (Constant), Security, Resource mobilization, Ebanking, Forecasting demand, Cashtransport, Loan, Cashstorage

b. Dependent Variable: Cashsupplychain

The "Model Summary" table provides an overview of the results from a regression analysis. In this case, the analysis focuses on the relationship between the independent variables (security,

resource mobilization, e-banking, forecasting demand, cash transport, loan, and cash storage) and the dependent variable, cash supply chain management.

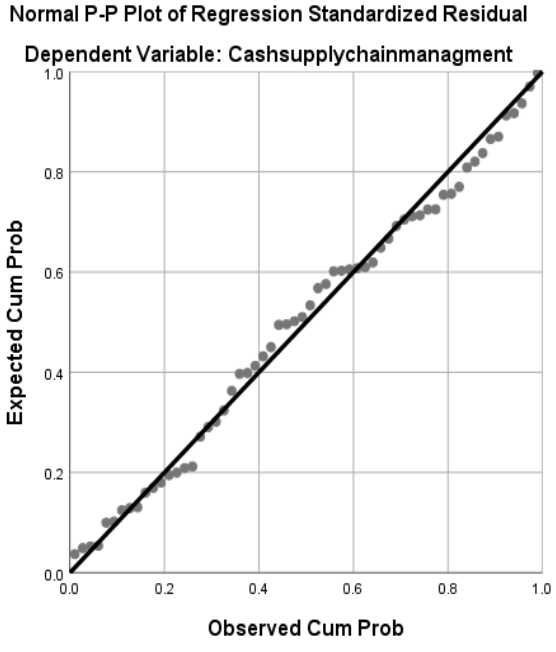
The table includes several key statistics. The correlation coefficient (R) is 0.810, indicating a strong positive relationship between the observed and predicted values of the dependent variable. The coefficient of determination (R Square or R^2) is 0.610, meaning that the model can explain 61% of the variance in cash supply chain management. The Adjusted R Square, which adjusts for the number of predictors in the model, is 0.558. This suggests that after accounting for the number of predictors, 55.8% of the variance in the dependent variable is explained by the model.

The standard error of the estimate is 0.12233, indicating the average distance that the observed values fall from the regression line. Lower values indicate a better fit. The change statistics include the R Square Change, which remains at 0.610, indicating no change as all predictors are included simultaneously. The F Change is 11.638, which shows the overall significance of the model. The degrees of freedom for the regression model (df1) is 7, indicating the number of predictors, and the degrees of freedom for the residuals (df2) is 52, indicating the sample size minus the number of predictors minus one. The Sig. F Change value is 0.000, indicating that the model is statistically significant at the 0.05 level.

Finally, the Durbin-Watson statistic is 2.266, which tests for autocorrelation in the residuals from a regression analysis. A value close to 2 suggests no autocorrelation, and in this case, it indicates little to no autocorrelation in the residuals.

Overall, the "Model Summary" table provides important information to evaluate the fit and significance of the regression model used to predict cash supply chain management based on the given predictors.

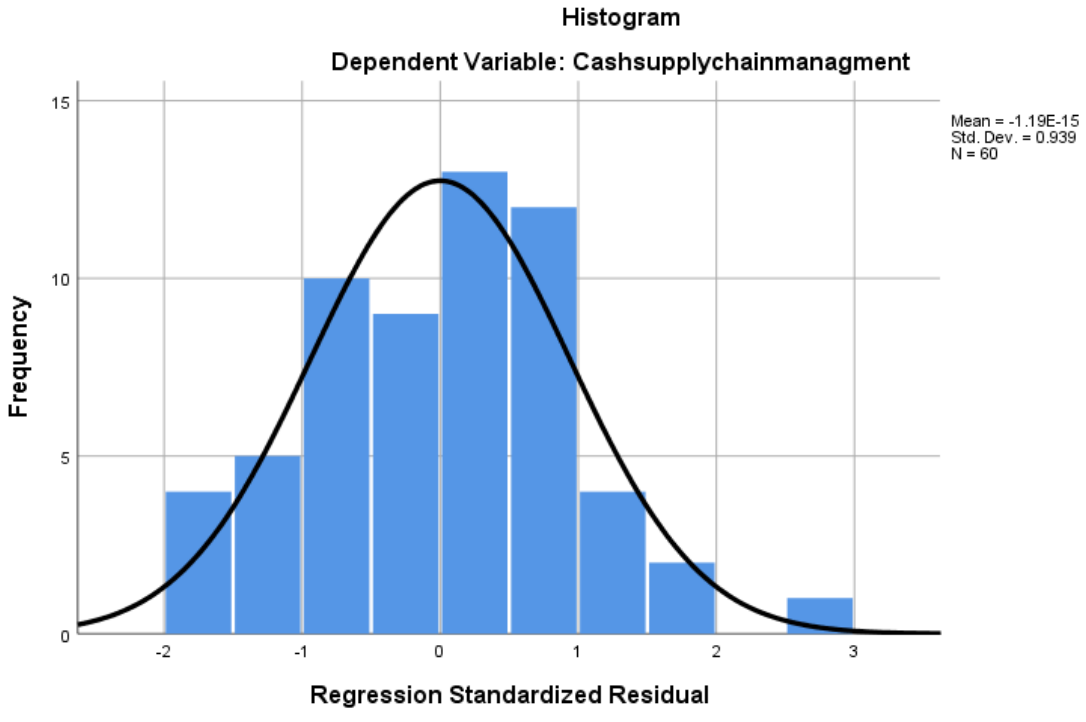
The P-P plot indicates that the standardized residuals of the regression model are approximately normally distributed. This suggests that the assumption of normality for the residuals is reasonably met, which supports the validity of your regression model. This is important for the reliability of hypothesis tests and confidence intervals derived from the model



This histogram displays the regression standardized residuals for your dependent variable, "Cash Supply Chain Management." Here are some key observations:

1. **Normality of Residuals**: The residuals appear to follow a roughly normal distribution, indicated by the bell-shaped curve overlaid on the histogram. This suggests that the assumption of normality for residuals in regression analysis is reasonably met.
2. **Mean and Standard Deviation**: The mean of the residuals is close to zero (-1.19E-15), and the standard deviation is 0.939. A mean close to zero is expected in a well-fitting regression model.
3. **Sample Size**: The sample size (N) is 60, which is relatively moderate and should provide a reasonable basis for statistical analysis.

In summary, the histogram indicates that the regression model's residuals are approximately normally distributed, supporting the validity of regression analysis assumptions.



Regression is a measure of association between two quantitative variables. It allows us to make statements about how well one or more independent variables will predict the value of a dependent variable. Table 4.15 below shows the regression analysis of the effect of cash storage, cash transport, lending, security, resource mobilization, e-banking, and forecasting demand for cash and cash supply in management

Regression analysis was utilized to determine the relationship between the research variables. Cash

Supply Chain Management was the dependent variable, and the independent variables were Cash Storage, Cash Transport, Security, Resource mobilization, Lending, E-banking, and Forecasting demand for cash. This analysis aimed to quantify the extent to which the independent variables explain the dependent variable.

Table 4.15: Regression Coefficients

Variable		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept		1.935129574	0.586549229	3.299177	0.0018	0.75758286	3.112676	0.75758286	3.112676287
Cash storage	3	0.246252948	0.071161334	3.460488	0.0011	0.103390608	0.389115	0.103390608	0.389115288
Cash Transport	3.5	0.151289376	0.061915972	2.443463	0.0180	0.026987875	0.275591	0.026987875	0.275590876
E-Banking	3.7	0.164974917	0.061043186	2.702593	0.0093	0.042425608	0.287524	0.042425608	0.287524226
Security	3.4	0.12703053	0.059375061	2.139459	0.0372	0.246230938	0.00783	0.246230938	0.007830122
Resource Mobilization	4	0.21085969	0.054056378	3.900737	0.0003	0.319382396	0.102337	0.319382396	0.102336984
Forecasting Demand for Cash	3.714286	0.16004114	0.064096777	2.496867	0.0158	0.03136149	0.288721	0.03136149	0.288720789
Lending	3.375	0.11906176	0.059486752	2.001484	0.0507	0.000362879	0.238486	0.000362879	0.238486398

Source; SPSS output 2024

Summary of Results

Intercept: The intercept coefficient is 1.9351, with a p-value of 0.0018, indicating it is statistically significant. This suggests that when all predictor variables are zero, the dependent variable has an average value of approximately 1.9351.

Cash Storage: The coefficient is 0.2463 with a p-value of 0.0011, indicating a statistically significant positive effect on the dependent variable.

Cash Transport: The coefficient is 0.1513 with a p-value of 0.0180, suggesting a statistically significant positive impact.

E-Banking: The coefficient is 0.1650 with a p-value of 0.0093, indicating a significant positive relationship.

Security: The coefficient is 0.1270 with a p-value of 0.0372, showing a statistically significant positive effect.

Resource Mobilization: The coefficient is 0.2109 with a p-value of 0.0003, suggesting a highly significant positive impact.

Forecasting Demand for Cash: The coefficient is 0.1600 with a p-value of 0.0158, indicating a significant positive relationship.

Lending: The coefficient is 0.1191 with a p-value of 0.0507, which is right at the typical significance threshold of 0.05, suggesting a marginally significant positive effect.

Hypothesis

Hypothesis	P-Value	Accepted/Rejected
H1:Cash storage impacts on the effectiveness of cash supply chain Management	0.0011	Accepted
H2: Effective Transportation has an impact on Cash supply chain management	0.018	Accepted
H3: Utilization of an E-Banking platform could minimize the problems in Cash supply chain management	0.0093	Accepted
H4: Having a Strong security system impacts the cash supply chain management	0.0372	Accepted
H5: Effective resource mobilization could enhance cash supply chain management.	0.0003	Accepted
H6: Effective demand forecasting on cash could enhance cash supply chain Management.	0.0158	Accepted
H7: Well-managed lending system could impact cash supply chain Management	0.0507	Accepted

The analysis of the hypotheses reveals that each of the factors examined has a significant effect on cash supply chain management. Cash storage significantly affects cash supply chain management, as indicated by a p-value of 0.0011. Similarly, cash transport also shows a significant effect, with a p-value of 0.0180. E-banking's impact is notable, with a p-value of 0.0093, demonstrating its crucial role in enhancing cash supply chain management. Security measures are similarly significant, evidenced by a p-value of 0.0372. Resource mobilization stands out with a highly significant effect, as indicated by a p-value of 0.0003. Forecasting demand for cash shows a significant relationship with cash supply chain management, supported by a p-value of 0.0158. Lastly, lending activities also significantly affect cash supply chain management, with a p-value of 0.0507. Overall, the findings indicate that improvements in cash storage, cash transport, e-banking, security, resource mobilization, forecasting demand, and lending are all critical for optimizing cash supply chain management.

Conclusion on Regression Analysis

The regression analysis reveals that all the predictor variables (Cash Storage, Cash Transport, E-Banking, Security, Resource Mobilization, Forecasting Demand for Cash, and Lending) significantly impact the dependent variable. The p-values for these predictors are all below or very close to the standard significance level of 0.05, indicating strong evidence against the null hypothesis that the coefficients are zero. This implies that these factors are important and positively associated with the dependent variable in the context of the study.

The study suggests that factors such as cash storage, cash transport, e-banking, security, resource mobilization, forecasting demand for cash, and lending are significant predictors of the dependent variable. These findings highlight the importance of these aspects in the context being studied, providing valuable insights for decision-making and strategic planning. The strong statistical significance of these predictors underscores their relevance and impact, suggesting they should be given due consideration in related policies and practices.

The analysis of the educational background of the respondents is shown in Table 4.3 above, which revealed that 48(80%) have a first degree, and 12(20%) have a Masters degree. Regarding the degree of challenges, all variables have a challenge, e-banking (Ranges between 3.93-4.50), resource mobilization,(Ranges between 3.88-4.48), Forecasting demand for cash, (Ranges between 4.35-4.60), lending (Ranges between 4.23 -4.60), Cash storage, (Ranges 4.23-4.61), Cash transport (Ranges between 4.23-4.60), and Security, (Ranges 4.23 -4.66).

The Pearson correlation analysis and multiple regression analysis of the data provide comprehensive insights into the factors influencing cash supply chain (CSC) management. E-banking exhibits a moderate positive correlation with CSC (0.452, p=0.045), indicating that improvements in electronic banking services are associated with better cash supply chain management. Forecasting demand shows a significant correlation with CSC (0.353, p=0.006), emphasizing the importance of accurate cash needs predictions for efficient management. Loan activities display very strong correlations with CSC (0.707, p=0.000), cash storage (0.986, p=0.000), cash transport (0.977, p=0.000), and security (0.969, p=0.000), highlighting the critical interconnectedness of lending activities with various aspects of cash management. The regression analysis confirms that cash storage, transport, e-banking, security, resource mobilization, forecasting demand, and lending significantly influence CSC management, with

the model explaining 61% of the variance in CSC. The adjusted R^2 value of 0.558 indicates that 55.8% of the variance in CSC is explained after accounting for the number of predictors. The Durbin-Watson statistic of 2.266 suggests no autocorrelation in the residuals, supporting the model's validity. Overall, the analysis underscores the importance of these factors in optimizing CSC management strategies, ensuring efficiency and security across all components.

Discussion and Interpretation

The analysis of the cash supply chain (CSC) management reveals several significant relationships, with notable findings on the role of e-banking, forecasting demand, loan activities, cash storage, transport, and security. When comparing these results to related studies, both similarities and differences emerge, and a moderate positive correlation between e-banking and CSC, suggesting that enhancements in electronic banking services are significantly associated with improvements in overall cash supply chain management. This aligns with Aliakbari et al. (2020), who also observed that technological advancements in e-banking significantly improve cash management systems. Makridakis, Wheelwright, and Hyndman (1998) similarly highlighted the importance of digital tools in managing supply chain activities, reinforcing your finding of e-banking's positive impact on CSC.

Regarding resource mobilization, the study showed a weak positive correlation with e-banking and no significant relationships with other variables. This indicates that improvements in e-banking do not necessarily lead to significant changes in resource mobilization. This contrasts with Caniato et al. (2016), who reported that enhanced financial services, including e-banking, could lead to better resource mobilization by providing better access to financial resources and streamlining financial operations. However, Misganu (2021) supports the findings, showing a limited direct impact of e-banking on resource mobilization.

The significant positive correlation between forecasting demand and CSC in your study highlights the crucial role of accurate predictions for efficient cash supply management. This is consistent with findings by Huan et al. (2004) and Wagner (2010), who demonstrated that effective forecasting methods are essential for optimizing supply chain performance, including cash supply chains.

The study revealed very strong positive correlations between loan activities and CSC, Cash Storage, Cash Transport, and Security. This indicates that efficient loan management significantly enhances overall CSC effectiveness. This finding is supported by Adetiloye and Okoye (2017), who found that lending activities are critical for maintaining liquidity and stability in cash supply chains. Similarly, Vatansever and Hepsen (2013) noted that effective loan performance positively impacts various aspects of financial and cash management.

The very strong positive correlation between Cash Storage and Cash Transport found in your study suggests that improving storage facilities directly enhances transportation efficiency. This is echoed by Silver, Pyke, and Peterson (1998) and Simchi-Levi, Kaminsky, and Simchi-Levi (2008), who also found that integrated management of storage and transportation significantly boosts supply chain efficiency.

Finally, the study found high correlations between Security and both Cash Storage and Cash Transport, underscoring the critical role of security measures in managing the CSC. This finding is consistent with Smith and Louis (2010), who emphasized the importance of security in managing cash-in-transit and storage. Additionally, Poisat, Mey, and Theron (2014) noted that robust security protocols are essential for safeguarding cash and ensuring supply chain reliability.

In summary, the study's findings align well with related research in highlighting the importance of e-banking, forecasting, and security in enhancing cash supply chain management. However, there are some differences in the impact of e-banking on resource mobilization, where the study found a weaker correlation compared to others. These insights collectively contribute to a deeper understanding of the factors influencing cash supply chain management and can guide decision-makers in optimizing their strategies for improved efficiency and security.Thus, the analysis reveals significant relationships between various aspects of cash management, with E-banking and Forecasting Demand playing pivotal roles in enhancing the CSC. Additionally, lending activities are closely tied to cash storage, transport, and security, highlighting their interconnectedness in the cash management system. These insights can guide decision-makers in optimizing their CSC management strategies, ensuring efficiency and security across all components.

CHAPTER FIVE

5. SUMMARY OF FINDING

The primary goal of this research is to determine the major factors that affect cash supply chain management in the Cooperative Bank of Oromia S.C. The primary elements affecting cash supply chain management have been summed up and categorized into seven variables in the study. These include Cash storage, Cash Transport, E-banking, Security, Cash demand forecasting, deposit mobilization, and Lending.Based on the Pearson correlation analysis and multiple regression analysis, the following key findings are identified:

- E-Banking Impact: E-banking has a moderate positive correlation with cash supply chain (CSC) management (0.452, p=0.045). This indicates that improvements in electronic banking services are significantly associated with better CSC management.
- Forecasting Demand: There is a significant positive correlation between forecasting demand and CSC management (0.353, p=0.006). Accurate predictions of cash needs are crucial for efficient CSC management.
- Loan Activities: Loan activities show very strong positive correlations with CSC (0.707, p=0.000), cash storage (0.986, p=0.000), cash transport (0.977, p=0.000), and security (0.969, p=0.000). This highlights the critical interconnectedness of lending activities with various aspects of cash management.
- Cash Storage and Transport: Cash storage and cash transport have a very strong positive correlation (0.953, p=0.000), indicating that efficient cash storage practices are closely linked to effective cash transportation.
- Security: Security is highly correlated with both cash storage (0.990, p=0.000) and cash transport (0.935, p=0.000), underscoring the critical role of security measures in safeguarding cash throughout its storage and movement processes.
- Multiple Regression Analysis: The regression model explains 61% of the variance in CSC management ($R^2 = 0.610$), indicating a robust fit. After adjusting for the number of predictors, 55.8% of the variance in CSC management is explained (Adjusted $R^2 = 0.558$).

Significant Predictors:

- ✓ Cash Storage: Statistically significant positive effect on CSC management (coefficient = 0.246, p=0.0011).
- ✓ Cash Transport: Statistically significant positive effect on CSC management (coefficient = 0.151, p=0.0180).
- ✓ E-Banking: A statistically significant positive relationship with CSC management (coefficient = 0.165, p=0.0093).
- ✓ Security: Statistically significant positive effect on CSC management (coefficient = 0.127, p=0.0372).
- ✓ Resource Mobilization: Highly significant positive impact on CSC management (coefficient = 0.211, p=0.0003).
- ✓ Forecasting Demand for Cash: A statistically significant positive relationship with CSC management (coefficient = 0.160, p=0.0158).
- ✓ Lending: Marginally significant positive effect on CSC management (coefficient = 0.119, p=0.0507).

Model Diagnostics: The Durbin-Watson statistic of 2.266 suggests no autocorrelation in the residuals, supporting the model's validity. The normality of residuals is confirmed, indicating that the assumptions of the regression analysis are reasonably met.Overall, the findings indicate that enhancements in e-banking, accurate forecasting of cash demand, efficient cash storage, and transport, robust security measures, effective resource mobilization, and efficient lending activities are critical for optimizing cash supply chain management.

CONCLUSION AND RECOMMENDATIONS

The conclusion is a summary of the major findings that answer the research question presented in Chapter One. The summary of the main findings in this chapter is the major factors of cash supply chain management. In addition, suggestions on how to solve the problem of cash supply chain management.

5.1. Summary of the study

The analysis of the educational background of the respondents is shown in Table 4.3 above, which revealed that 48(80%) have a first degree, and 12(20%) have a Masters degree. The result of regression coefficients also further revealed that beta coefficients on most of these factors indicate an increase in the execution variable will increase the efficiency of the cash supply chain.

The regression analysis indicates that all predictor variablesCash Storage, Cash Transport, E-Banking, Security, Resource Mobilization, Forecasting Demand for Cash, and Lendingsignificantly and positively impact the dependent variable, with p-values below or near 0.05, confirming their importance in the study.

The degree of challenges, all variables have a challenge, e-banking (Ranges between 3.93-4.50), resource mobilization,(Ranges between 3.88-4.48), Forecasting demand for cash, (Ranges between 4.35-4.60), lending (Ranges between 4.23 -4.60), Cash storage, (Ranges 4.23-4.61), Cash transport (Ranges between 4.23-4.60), and Security, (Ranges 4.23 -4.63).
Based on the result of the mean score of the variables, cash demand forecasting is the first, security is the second, lending is the third, cash transport is fourth, cash storage is fifth, e-banking is sixth and deposit mobilization is seventh. Regarding the degree of challenges, all variables have a challenge, (Ranges between 3.88-4.63).

5.2. Conclusion

Based on the collected data and the results obtained from analyses, interpretations, and discussions of the findings of the study, it is evident that several major factors significantly affect cash supply chain management. These factors include cash transport, cash storage, e-banking, security, resource mobilization, forecasting demand for cash, and lending.
Based on the comprehensive analysis of the data related to cash supply chain management in the context of a private bank, several key conclusions can be drawn. The study examined the relationships between various independent variables—cash storage, cash transport, e-banking, security, resource mobilization, forecasting demand, and lending—and their impact on the dependent variable, cash supply chain management.

Key Findings

- E-Banking: The analysis revealed that e-banking has a moderate positive correlation with cash supply chain management (0.452, p=0.045). This suggests that enhancements in electronic banking services are significantly associated with improvements in the efficiency and effectiveness of the cash supply chain.
- Forecasting Demand: Accurate forecasting of cash needs is crucial, as indicated by a significant positive correlation with cash supply chain management (0.353, p=0.006). This underscores the importance of reliable demand prediction mechanisms in maintaining a well-functioning cash supply chain.
- Loan Activities: Lending activities are critically interconnected with various aspects of cash management. They show very strong positive correlations with cash supply chain management (0.707, p=0.000), cash storage (0.986, p=0.000), cash transport (0.977, p=0.000), and security (0.969, p=0.000). These strong correlations highlight the necessity of integrating lending activities within the overall cash management strategy.
- Cash Storage and Transport: There is a very strong positive correlation between cash storage and cash transport (0.953, p=0.000), indicating that efficient cash storage practices are closely linked to effective cash transportation. Ensuring proper storage facilities directly enhances the transportation process.
- Security: Security measures play a vital role in safeguarding cash, as evidenced by high correlations with cash storage (0.990, p=0.000) and cash transport (0.935, p=0.000). This finding emphasizes the need for robust security protocols throughout the cash supply chain to prevent losses and ensure smooth operations.
- Resource Mobilization: Resource mobilization shows a significant impact on cash supply chain management with a highly significant positive effect (p=0.0003). Effective mobilization of resources is essential for maintaining the liquidity and operational efficiency of the cash supply chain.

The multiple regression analysis confirmed that the combination of these variables explains a substantial portion of the variance in cash supply chain management, with an R^2 value of 0.610, indicating that 61% of the variance is explained by the model. The adjusted R^2 value of 0.558, which accounts for the number of predictors, still indicates that 55.8% of the variance is

explained, affirming the robustness of the model. The Durbin-Watson statistic of 2.266 suggests no autocorrelation in the residuals, supporting the validity of the regression model.

In conclusion, the study provides strong evidence that improvements in cash storage, cash transport, e-banking services, security measures, resource mobilization, forecasting demand, and lending activities are critical for optimizing cash supply chain management in a private banking context. These factors are interrelated and collectively contribute to the efficiency, security, and reliability of the cash supply chain. The significant positive effects of these variables highlight the need for a comprehensive and integrated approach to cash management, where technological advancements, accurate forecasting, and robust security measures are prioritized. Implementing these insights can lead to enhanced cash supply chain operations, ensuring that cash availability meets customer demands, and minimizing delays and inefficiencies in cash transactions.

The study found inefficiencies in the transport and storage of cash, and weak performance in deposit mobilization, and lending. Additionally, there is suboptimal utilization of e-banking services, failures to establish strong security systems during cash-in-transit, and inaccuracies or a complete absence of accurate forecasting demand for cash. These inefficiencies collectively impact the cash supply chain management.

The current cash supply chain management practices are directly affecting the bank's performance. According to the respondents, the bank has lost a significant amount of cash during cash-in-transit over the last three years. This indicates that critical failures in the mentioned factors are hindering the effectiveness of cash supply chain management. Therefore, addressing these inefficiencies is crucial to improving the overall performance and security of the bank's cash supply chain management system.

5.3. Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed to address the inefficiencies and improve the effectiveness of cash supply chain management:

Enhance Cash Transport and Storage Systems: Invest in advanced technology and secure vehicles for cash transport to minimize losses and improve efficiency. Additionally, upgrade storage facilities to ensure they are secure and capable of handling the volume of cash processed.

Improve Security Measures**:** Establish and maintain robust security protocols for cash-in-transit operations. This includes training personnel, using armored vehicles, implementing GPS tracking, and employing real-time monitoring systems to prevent theft and losses.

Optimize Resource Mobilization and Lending Practices: Strengthen deposit mobilization strategies and lending practices. This could involve offering to supply sufficient cash across all branches, and ATMs, creating customer-friendly products and improving customer service to attract more deposits and enhance lending efficiency.

Utilize E-Banking Services Effectively: Promote the use of e-banking services among customers to reduce the dependency on physical cash transactions, and to reduce challenges in the cash supply activities. This includes enhancing the functionality of online banking platforms, and mobile banking apps, and ensuring that these services are user-friendly and secure.

Implement Accurate Cash Forecasting: Develop and utilize advanced forecasting tools and techniques to predict cash demand accurately. This will help in planning and managing cash flow more effectively, reducing the risk of cash shortages or surpluses.

Regular Training and Development**:** Provide regular training to employees on the best practices in cash management, security procedures, and the use of technology. Well-trained staff can significantly enhance the efficiency and security of cash-handling processes.

Monitor and Evaluate Performance**:** Establish a system for regularly monitoring and evaluating the performance of cash supply chain management. This will help in identifying issues promptly and implementing corrective measures to ensure continuous improvement.

Enhance Collaboration and Communication**:** Foster better communication and collaboration between different departments involved in cash management. This ensures a coordinated approach to managing cash supply chain processes, leading to greater efficiency and effectiveness.

By implementing these recommendations, the bank can address the critical failures identified in the study, thereby improving the overall efficiency and security of its cash supply chain management system.

5.4. SUGGESTIONS FOR FURTHER STUDY

A potential suggestion for future study could be to delve deeper into the specific impact of implementing e-banking solutions on cash supply chain management in banking institutions. This study could focus on how the adoption of e-banking technologies, such as mobile banking apps, online payment platforms, and digital wallets, influences cash handling processes, security measures, customer behavior, and overall operational efficiency within the cash supply chain. Gathering data from multiple banks or financial institutions that have implemented e-banking solutions and comparing their experiences with those still relying primarily on traditional cash-handling methods could provide valuable insights into the opportunities and challenges associated with digital transformation in the banking sector.

Schedule and budget

Schedule

March. 25 --- March 30, 2024 Permission time

April 10------April 15, 2024: First round of interviews, transcribing data. and distribute the questionnaires' Check participants against the matrix, and identify further participants (if necessary).

April 16 -----April 30, 2024: Second round of interviews (staff, vice president. etc), collecting questionnaires and Complete document analysis identifying key markers of change.

May 1-----May 15, 2024: Draft of the analysis chapters.

May 16, 2024 -------May 30, 2024: Draft of the theory chapter; implications and Conclusions.

June 1, 2024----June 15, 2024: Revise first three chapters: Rationale, Literature Review, Research Methods and Design.

June 16-----June 30, 2024: Revise Data Analysis and Theory chapters. Revise for Final submission.

Budget

No.	Particular	Budget
1	Stationery items	4,000.00
2	Printing and Copy	5,500.00
3	Internet	5,000.00
4	Other Miscellaneous cost	10,500.00
	Total	25,000.00

REFERENCES

- ✓ Arnold, J. R. T. (2008). Introduction to Materials Management. Pearson Education.
- ✓ Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2002). Supply Chain Logistics Management. McGraw-Hill.
- ✓ Brigham, E. F., & Ehrhardt, M. C. (2013). Financial Management: Theory & Practice. Cengage Learning.
- ✓ Christopher, M. (2016). Logistics & Supply Chain Management. Pearson.
- ✓ Harris, F. W. (1913). How Many Parts to Make at Once Factory, The Magazine of Management, 10(2), 135-136.
- ✓ Jorion, P. (2007). Value at Risk: The New Benchmark for Managing Financial Risk. McGraw-Hill.
- ✓ Makridakis, S., Wheelwright, S. C., & Hyndman, R. J. (1998). Forecasting: Methods and Applications. Wiley.
- ✓ Silver, E. A., Pyke, D. F., & Peterson, R. (1998). Inventory Management and Production Planning and Scheduling. Wiley.
- ✓ Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2008). Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies. McGraw-Hill.
- ✓ Kurvers (2019). The impact of information technologies on cash supply chain efficiency
- ✓ Misganu (2021). Determinants of Private Commercial Banks' Lending in Ethiopia
- ✓ Van Anholt, R. G. (2014). Optimizing Logistics Processes in Cash Supply Chains. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam]. Amsterdam Business Research Institute
- ✓ Aliakbari et al. (2020). Sustainable service supply chain practices (SSSCPs): a framework development. International Journal of Productivity and Performance Management.
- ✓ Hatzakis, et al (2010). Operations in financial services overview. Production and Operations Management.

- ✓ Huan, et al.(2004). A review and analysis of the supply chain operations reference (SCOR) model. Supply Chain Management, Volume 9, Number 1, pp. 23-29.
- ✓ Okino, et al. (2011). Applying supply chain management models in the banking industry: a Brazilian case analysis.
- ✓ Lin Y. et al. (2010). Service Supply Chain: Nature, Evolution, and Operational Implications. In: Huang G.Q., Mak K.L., Maropoulos P.G. (eds) Proceedings of the 6th CIRP-Sponsored International Conference on Digital Enterprise Technology. Advances in Intelligent and Soft Computing.
- ✓ Okino, D. A. (2010). Gestão da cadeia de suprimentos aplicada à operação de numerário no Brasil. Master thesis. Escola de Administração de Empresas de São Paulo. Fundação Getúlio Vargas, São Paulo, Brazil.
- ✓ Perera, et. Al. (2018). Determinants of automated Teller machine loading demand requirements in Sri Lankan cash supply chains. 2018 International Conference on Production and Operations Management Society (POMS).
- ✓ Rajamani, et.al(2006). A Framework to Analyze Cash Supply Chains, Production and Operations Management; v. 15, i. 4, p. 544–552.
- ✓ SCC – The Supply-Chain Council (2010). SCOR: Supply Chain Operations Reference Model – Version 10.0. The Supply Chain Council, ISBN 0-615-20259-4 (binder), August 2010, version 10.0
- ✓ Smith, et.al. (2009). China's renminbi currency logistics network: A brief introduction. SSRN Electronic Journal.
- ✓ van Anholt, R. G. (2014). Optimizing Logistics Processes in Cash Supply Chains. Amsterdam Business Research Institute.
- ✓ Wagner (2010). Forecasting daily demand in cash supply chains. American Journal of Economics and Business Administration.
- ✓ Boer, R. D., Steeman, M., & Bergen, M. V. (2015). Supply Chain Finance, Its Practical Relevance and Strategic Value. Supply Chain Finance Community.
- ✓ Caniato, F., Gelsomino, L. M., Perego, A., & Ronchi, S. (2016). Does Finance Solve the Supply Chain Financing Problem? Supply Chain Management: An International Journal, 21, 534-549.

- ✓ Caniato, F., Henke, M., & Zsidisin, G. A. (2019). Supply Chain Finance: Historical Foundations, Current Research, Future Developments. Journal of Purchasing and Supply Management.
- ✓ Vatansever, M. & Hepsen, A. (2013). Determining impacts on non-performing loan ratio in Turkey. Journal of Finance and Investment Analysis, 2(4), 119-129.
- ✓ WakjiraDejene (2020). The factors affecting non-performing loans in the Ethiopian Banking sector Specific case of Commercial Bank of Ethiopia, St. Mary‟s University unpublished MBA thesis.
- ✓ William Abungu and Clement O.Olando, (2020). Analyzed on Influence of Bank Specific Factors on Non-Performing Loans among Commercial Banks in Kenya, Advances in Economics and Business 8(3), 105-121.
- ✓ Wondemagegn, N. (2012). Determinants of Non-Performing Loans: The case of Ethiopian Banks." University of South Africa.
- ✓ Ikpefan, O. A. (2007). Money transfer services in banks: A case study of Western Union Money Transfer. Nigerian Journal of Banking and Financial Issues, 122-140.
- ✓ Mbuguah, C. (2013). Response strategies to fraud by the listed commercial banks in Kenya. (Unpublished MBA Project, University of Nairobi).
- ✓ Myers, N. (2010). Review of the roots of youth violence: Literature reviews: Volume 5, Chapter 3.
- ✓ Ndonga, S. (2014). Police recover Sh13m stolen cash-in-transit. Retrieved from www.capitalfm.co.ke
- ✓ Njiraini, J. (2010). G4S unveils tough measures to prevent theft of transit cash. Retrieved from www.standardmedia.co.ke
- ✓ Nwankwo, G. O. (1992). Banking fraud. Lecture delivered at the 5th Anniversary of Money Market Association of Nigeria.
- ✓ Pandey, S., & Jaiswal, V. K. (2011). Effectiveness on profitability: working capital management. SCMS Journal of Indian Management, 8(1), 73.
- ✓ Pillay K. (2008). The impact of stress and trauma on the occupational environment of CIT security officers—an exploratory perspective. International Society for Criminology XV World Congress, Barcelona 20–25 July 2008.

- ✓ Poisat, P., Mey, M., & Theron, A. (2014). Social support key to cash in transit guards' psychological wellbeing. Problems and Perspectives in Management, 12(4), 312-319.
- ✓ Casterman, A. (2010). Collaborative Supply Chain Finance. Dialogue Q4.
- ✓ Al Slehat, N., & Al-Nimer, M. (2017). An empirical study of the relationship between cash flow management and financial performance of the Jordanian insurance companies. International Business Management, 11(3), 776–782.
- ✓ Adetiloye, K., & Okoye, O. (2017). Credit risk management: Implications on bank performance and lending growth. Saudi Journal of Business and Management Studies, 2, 584-590.
- ✓ Temesgen, A. (2016). Determinants of Banks' Lending Behaviour In Ethiopia-Pragmatic Evidence From Commercial Banks. ITIHAS-The Journal of Indian Management.
- ✓ Getahun, A. (2014). determinants of lending behavior of banks: a case study on commercial banks of Ethiopia. Master thesis. The University of Addis Ababa.
- ✓ Gezae, A. (2015). Determinants of banking sector development in Ethiopia. School of Graduate Addis Ababa University, Ethiopia.
- ✓ Smith, L., & Louis, E. (2010). Cash in transit armed robbery in Australia. Trends and issues in crime and criminal justice, (397), 1.
- ✓ Taylor, J. (2007). Company fraud in Victorian Britain: The Royal British Bank Scandal of 1856. The English Historical Review, 122(497), 700-724.
- ✓ Tremblay, P. (2008). Searching for suitable Co-Offenders. In: R. V. Clarke & M. Felson, eds. Routine Activity and Rational Choice. New Jersey: Transaction, pp. 17 – 36.
- ✓ Alan Rushton, J.P. (2004). Logistics and Logistics Management. 1st edition, London. British Library.
- ✓ B.Ingham, D. (2002). Transportation Phenomena, 5th edition, Romania: University of Cluj.
- ✓ Babbie, E. (1990). Survey Research Methods. California. Wadsworth.
- ✓ Bhat, K. (2011). Logistics Management. 2nd edition. Karnataka. India: Himalaya publishing house.

- ✓ Bryman, D. (2004). Research Methodology 2nd ed. London, England: Strong Publication Centre Burgess, R. G. (Ed.). (1989). The ethics of educational research (Vol. 8). Psychology Press.
- ✓ C.R. Kothari. (2004). Research Methodology. 2nd edition, New Delhi. New age International blushers.
- ✓ C.A. O'Flaherty. (2006). Transport Planning and Engineering. 6th edition, New Delhi: Khanna PU.
- ✓ Creswell, J.W. (2003). Research design, qualitative, quantitative and mixed methods approach. Second Edition, Stage Publications, Thousands oaks.
- ✓ Croucher, P., And Oxley, A. (2000). Logistics and Distribution Management. 4th edition, British Library Cataloguing in Publication Data.
- ✓ David J. Kechen. J.D. (2005). Research Methodology in Strategy and Management. 1st edition London: British Library.
- ✓ Donald J. Bowersox, David J. Closs, M. Bixby Cooper, (2002). Supply Chain Logistics Management: Michigan State University, McGraw-Hill Higher Education.
- ✓ Edward Frazelle (2002). Supply Chain Strategy: The Logistics of Supply Chain Management, McGraw Hill Companies, New York.
- ✓ Ensermu, M. (2013). Logistics and Supply Chain management. Addis Ababa: Ababa University.
- ✓ Eva, K. (2006). Management of supply Chain, Masters Degree thesis, Lijubljana University Faculty of economics.
- ✓ Fair, M.L. and Williams, E.W. (1981). Transportation and logistics. 8th edition, India: Rajkamal electric press.
- ✓ Admassu, B. and Asayehgn, D. (2014). Banking Sector Reform in Ethiopia. International Journal of Business and Commerce, 3 (8), 25-38, ISSN:2225-2436.
- ✓ Albulescu, C. (2014). Banks' Profitability and Financial Soundness Indicators: A Macro Level Investigation in Emerging Countries. Science Direct, Procedia Economics and Finance, 23 (2015) 203-209.

- ✓ Andebet, M. (2016). Performance of private commercial banks in Ethiopia, pre and post National Bank of Ethiopia bill periods. Thesis,department of Management, college of Business and Economics Addis Ababa University, Ethiopia.
- ✓ Aspal, P. K. and Sanjeev, Dh. (2016). Camels Rating Model for Evaluating Financial Performance of Banking Sector: A Theoretical Perspective. International Journal of System Modeling and Simulation, 1(3).
- ✓ Capraru, B. and Ihnatov, I. (2014). Banks' Profitability in Selected Central and Eastern European Countries. Procedia Economics and Finance, ELSIVIE, 16 (2014), 587-591.
- ✓ Dakito, A. (2015). Assessment of Banking Performance Using Capital Adequacy in Ethiopia. Journal of Economics, 4(6): 106-111; ISSN: 2376-6603 (Online). DOI: 10.11648/j.eco. 20150406.12.
- ✓ Dawit, F. (2016). Determinants of commercial banks financial performance in Ethiopia. A thesis. Department of Accounting and Finance College of Business and Economics Addis Ababa University, Addis Ababa, Ethiopia.
- ✓ Ermias, M. (2016). Financial Performance of Private Commercial Banks in Ethiopia: A CAMEL Approach. A Thesis. Department of Accounting and Finance

Addis Ababa University

School of Commerce

Department of Logistics and Supply Chain Management

Questionnaire on Factors Affecting Cash Supply Chain Management

Questionnaire to Respondents

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

GRADUATE PROGRAM

Dear Respondents!

My Name is Elias Solomon, I am conducting this research on ***The Factors Affecting Cash Supply Chain Management in Coop Bank of Oromia S.C***. The research is a part of my partial fulfillment of the requirements for the Master of Arts in Logistics and Supply Chain Management. Its result is also beneficial for both the main department as well as university.

In order to make this research competes and beneficial, I am kindly requesting your genuine and positive response to the issues' asked in this questionnaire's sheet. With due confidence I have in you, I believe your answer plays a fundamental role in validating this thesis and its outcome. Nevertheless, I would like to assure you that your response or information to be providedis to be used for the purpose of this research only ,otherwise, they are subject to confidentiality and must be kept authentically.

Having said the above, I am kindly requesting your cooperation and would like to extent my thanks in advance for giving me valuable time in response this questions.

General Directions:

- No need of writing your name

 Pleaseput check mark (✓), in the appropriate box/table.

 Read carefully each questions or statement.

 Check this questionnaire has**5** Pages.

 If you have any questions or comments, contact me and I am available as per your convenience at:

 Cell-phone +251913081288

 E-mail eliasolomon2014@gmail.com

I thank you in advance for your kindness and cooperation!

Questioner
A. Current Position 1. Expert, 2. Lower-level Manager, and 3. Middle-level Manager
B. Sex; 1. Male 2. Female
C. Years of Experience 1. 0-5. 2. 6-10 3. 11-15 4. 15-20 5. 21 and longer
D. Educational Qualification 1. Certificate 2. Diploma 3. BA/ BSC 4. MA/MSC 5. PHD and Above
E. Age; 1. 22-30 , 2. 31-40, 3. 40-50, 4 51 and above
F. Marital status; 1. Single 2. Married

Sr. No.	Variables	Strongly agree (5)	Agree (4)	Undecided (3)	disagree (2)	Strongly Disagree (1)
A	Cash storage					
1	The bank has insufficient cash storage facilities at all regions or areas of operation					
2	Efficient cash storage management contributes positively to cash supply chain management.					
3	Inefficiency in cash storage management could affect cash supply chain management.					
4	Cash storage constitutes a key aspect of cash supply chain management.					
5	Ensuring adequate cash storage facilities in all directions can improve the efficiency of cash supply processes.					
6	Mostly the cash storage at Branches, issue accounts, and centers keeps below the average inventory level of cash in their custody					
B	Cash Transport	Strongly agree (5)	Agree (4)	Undecided (3)	disagree (2)	Strongly Disagree (1)
1	Improving cash transportation could optimize cash supply chain management.					
2	Enhancing cash transportation could improve cash supply chain management.					
3	Cash transport constitutes a vital component of cash supply chain management.					
4	Establishing an efficient transportation network linking branches, centers, and work units can positively influence cash supply operations.					
5	The bank has no effective, and reliable transportation system within its cash supply processes.					
6	The Bank did not effectively utilize transport capacity					
C	E-Banking	Strongly agree	Agree	Undecided	disagree	Strongly

		(5)	(4)	(3)	(2)	Disagree (1)
1	Utilizing E-banking can mitigate risks within the cash supply chain.					
2	E-banking has the potential to reduce the circulation of physical cash.					
3	The adoption of E-banking could enhance the management of the cash supply chain.					
4	All Bank's customers do not effectively utilize E-banking services.					
5	Coop Bank has not implemented E-banking extensively across all its branches.					
6	The volume of transactions conducted through E-banking is slowly increasing.					
7	Extended downtime of ATMs significantly disrupts the cash supply process.					
8	I frequently observe downtime occurrences with ATMs.					
9	The bank has not ensured ample and accessible ATMs across all regions.					
10	Utilizing E-banking at the bank is not effective.					
D	Security	Strongly agree (5)	Agree (4)	Undecided (3)	disagree (2)	Strongly Disagree (1)
1	Implementing a robust security system can safeguard the cash supply chain process.					
2	Security does indeed influence cash supply chain management.					
3	The bank encountered numerous challenges such as robberies and theft in the past three years due to inadequate security measures.					
4	A strong security system did not deploy into the bank's cash supply processes.					
5	The bank did not prioritize substantial investments in security during cash-in-transit operations					
E	Resource Mobilization	Strongly agree	Agree	Undecided	disagree	Strongly

		(5)	(4)	(3)	(2)	Disagree (1)
1	The bank could not maintain a high rate of deposit retention during the past fiscal years					
2	Efficient resource mobilization could alleviate cash shortages across all branches.					
3	Resource or deposit mobilization has the potential to address challenges in cash supply chain management.					
4	The bank could not achieve outstanding performance in resource mobilization over the past two years.					
5	The bank encounters liquidity issues stemming from unsuccessful resource mobilization efforts.					
6	The bank's performance in deposit mobilization has been categorized under weak status over the last two years.					
F	Forecasting of demand for cash	Strongly agree (5)	Agree (4)	Undecided (3)	disagree (2)	Strongly Disagree (1)
1	Accurate forecasting of cash demand can enhance cash supply chain management.					
2	Forecasting cash demand does indeed relate to the effectiveness of the cash supply chain.					
3	Efficiently forecasting cash demand positively influences customer satisfaction.					
4	Coop Bank consistently could not excel in forecasting its cash demand.					
5	The bank's cash flow projection remains weak					
6	The average daily cash demand at the bank is below the standard.					
7	There have been fluctuations between cash demand and delivery at various branches.					
G	Lending/ Loan/	Strongly agree (5)	Agree (4)	Undecided (3)	disagree (2)	Strongly Disagree

						(1)
1	Lending directly affects cash supply chain management.					
2	Excessive lending can adversely affect the cash supply chain.					
3	Over-lending may impact resource mobilization efforts.					
4	Excessive lending contributes to cash shortages or liquidity crises.					
5	Coop Bank did not ensure proper management of its lending system and loan disbursement processes.					
6	Coop Bank could not efficiently allocate resources concerning loans disbursed.					
7	The bank did not manage the loan-to-deposit ratio effectively.					
8	The non-performing status of loans directly influences the flow of physical cash.					
H	Cash supply chain management	Strongly agree (5)	Agree (4)	Undecided (3)	disagree (2)	Strongly Disagree (1)
1	I noticed significant problems within Coop Bank's cash supply chain system that could potentially impact the bank's overall performance.					
2	The current cash supply chain system utilized by Coop Bank is not efficient and effective.					
3	I believe that inefficiencies in cash supply chain management directly impact the bank's profitability.					
4	There is a necessity to enhance the current cash supply chain system.					
5	The bank has previously experienced negative impacts like robberies due to inefficient cash supply chain management, particularly in the last three years					
6	Customers were not satisfied with the cash supply activities within the Bank					
7	The bank didn’t have sufficient logistics to					

	supply cash across all regions					
8	The Bank did not use advanced information technology to manage the cash supply process					
9	The Bank uses traditional means of communication during cash-in-transit					
10	The cash supply chain management system in the Bank is the same as in the last 5-10 years back					
11	The Bank didn't have sufficient cash balance at the NBE payment and settlement account most of the time					
12	The bank has faced liquidity problems for the last two years					

Thank You!