

**LIQUIDITY MANAGEMENT RISKS, BOARD INDEPENDENCE AND  
FINANCIAL PERFORMANCE OF TIER-1 SAVINGS AND CREDIT  
COOPERATIVES (SACCOS) IN KENYA**

**BY**

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**DECLARATION**

**Declaration by the Candidate**

This research project is my original work and has not been previously presented for a degree in Moi University or any other university. No part of this research project may be reproduced without the prior written permission of the author and /or Moi University.

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## **DEDICATION**

I dedicate this work firstly to my loving wife Stellah Mbori and son Jovan Leakey for their prayers, love and encouragement.

I further dedicate this research project to my mom, the late Margaret Akeyo and Mom in Law, Mrs. Selina Mwawughanga, and my siblings Samson, Samuel, Chief and Linda.

Special dedications finally are directed to Mr. Fazul Mahamed, Director \General Private Security Regulatory Authority, Ministry of Interior and National Administration for full support rendered.

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## ABSTRACT

Savings and Credit Cooperatives (SACCOS) play a significant role in resource mobilization and serve as the foundation for entrepreneurial activities in developing countries like Kenya. Though studies suggest that liquidity management affects performance of credit cooperatives, extant literature shows mixed results. Thus, this study sought to examine whether board independence moderates the relationship between liquidity management risks and financial performance of Tier-1 Savings and Credit Cooperatives (SACCOS) in Kenya. Specifically, the study sought to establish the effect of cash to deposit ratio, deposit to total assets ratio, and loan to deposit ratio on the financial performance of Tier-1 SACCOS in Kenya. The study further examined the moderating effect of board independence on the relationship between: cash to deposit ratio, deposit to total asset ratio and loan to deposit ratio on financial performance among Tier-1 SACCOS in Kenya. The study was anchored on the liquidity preference and agency theories. The study adopted the longitudinal explanatory research design. The target population was 44 tier-1 SACCOS. However, after applying an inclusion/exclusion criterion the final sample comprised of 30 tier-1 SACCOS. The study used secondary data for the period between 2013 -2022 that was extracted from annual financial statements of 30 tier-1 SACCOS targeted by the study and SASRA annual reports. Data was analyzed through descriptive and inferential statistics. The study adopted the hierarchical regression models to test for moderation and the choice between the fixed effect and random effect was based on the results of Hausman test. Based on the regression results, the study found that cash to deposit ratio ( $\beta = 0.1466$ ;  $\rho < 0.05$ ), deposit to total asset ratio ( $\beta = 0.1405$ ;  $\rho < 0.05$ ) and loan to deposit ratio ( $\beta = 0.0238$ ;  $\rho < 0.05$ ) had a significant positive effect on financial performance of tier-1 Saccos with an  $R^2$  of 44.92 percent. The study further found that board independence moderated the relationship between cash to deposit ratio ( $\beta = -0.1968$ ;  $\rho < 0.05$ ), deposit to total assets ( $\beta = -0.3306$ ;  $\rho < 0.05$ ), loan to deposit ratio ( $\beta = -0.1108$ ;  $\rho < 0.05$ ) and financial performance of tier-1 Saccos with an  $R^2$  of 48.37 percent. The study concluded that the liquidity management risks are key determinants of financial performance of tier-1 Saccos in Kenya and that board independence moderates that relationship. The study's conclusions have implications for managers and regulators. First, managers should set appropriate limits on liquidity management ratios as a way of improving financial performance. These limits should be based on a comprehensive assessment of the Saccos' risk profiles; financial health, and macroeconomic conditions. Secondly, the regulator should enhance board's oversight function. There is need for independent directors to be knowledgeable on SACCOS operations and financial management. The study recommends that future studies may consider the moderating role of other board attributes and SACCOS operating in different countries, which could provide a better understanding of the subject matter.

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**ACRONYMS AND ABBREVIATIONS**

<b>ACCOSSCA</b>	Africa Federation of Cooperative Societies Savings and Credit Association
<b>DT-SACCOs</b>	Deposit Taking Savings and Credit Co-operative Societies
<b>ICA</b>	International Cooperative Alliance
<b>KCC</b>	Kenya cooperative Creameries
<b>KFA</b>	Kenya Farmers Association
<b>KPCU</b>	Kenya Planters Co-operative Union
<b>KUSCCO</b>	Kenya Union of Saving and Credit Cooperatives
<b>SACCOS</b>	Savings and Credit Cooperative Society
<b>SASRA</b>	Sacco Societies Regulatory Authority
<b>US</b>	United States
<b>WOCCU</b>	World Council of Credit Unions

## OPERATIONAL DEFINITION OF TERMS

**Board Composition:** This is related to board independence (including independence of board committees), diversity (firm and industry experience, functional backgrounds, etc.) of board members.

**Board Independence:** Refers to the steps and structures to ensure that insiders and executive owners are unable to exercise undue control over the board's activities and decisions.

**Cash Management:** This is the corporate process of collecting, managing and (short-term) investing cash; a key component of ensuring a company's financial stability and solvency, (SACCO Act, 2004).

**Cash to deposit ratio:** is a financial metric used to assess the liquidity of a financial institution, such as a bank. This ratio is calculated by dividing the total cash and cash equivalents held by the institution by the total customer deposits it has on its books (Sathyamoorthi, Mapharing & Dzimiri, 2020).

**Cooperative:** This is an autonomous association of persons united voluntarily to meet their common economic and social needs (Kumar, Wankhede & Gena, 2015)

**Corporate Governance:** Defines the methods, structure and processes of a Company in which the business and affairs are managed and directed. It also enhances the long-term shareholder value by the process of accountability of managers and enhances the firm's performance.

**Deposits to total asset ratio:** is a financial metric used to assess the proportion of a financial institution's total assets that are funded by customer

deposits. It provides insights into the reliance of the institution on customer deposits as a source of funding for its operations and investments. (Nguyen, 2021).

**Deposit-taking business:** This is a SACCO business in which the person conducting the business holds himself out as accepting deposits on a day-to-day basis, (SACCO Societies Act, 2008).

**Financial Performance** This is the process of measuring the results of a firm's policies and operations in monetary terms. It is a measure of how a firm is utilizing its assets to generate wealth or value for its stakeholders and which is measured by various returns as indicated by ROA, ROE and ROS.

**Liquidity Management:** This is SACCO's ability to meet share and savings withdrawals, external borrowing repayments, member loan demand and operating expenses, (SACCO Act, 2004).

**Liquidity Risk Management:** This is defined as the risk of being unable to meet their obligations to depositors or to fund increases in assets as they fall due without incurring unacceptable costs or losses.

**Loan to deposit ratio:** is a financial metric used to measure the relationship between the loans a financial institution, typically a bank, has made and the deposits it holds from its customers (Anggari & Dana, 2020).

**Membership growth:** This is the increase in the number of members in the SACCO. It is the idea of expanding the amount of paid member subscriptions.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Overview**

This chapter entails the background of the study, problem statement, research questions, objectives, hypothesis, significance and scope of the study.

#### **1.1 Background of the Study**

A firm's financial performance is an important indicator of its overall financial health as well as its level of competitiveness, efficiency, cost effectiveness, and overall productivity (Mauki, Jeckoniah & Massawe, 2023). Inevitably, the financial performance of an organization plays a significant role in deciding its expansion and its ability to remain viable in the long run. Evidently, Savings and Credit Cooperative Societies (SACCOS) that enjoy strong financial performance display high profitability, better portfolio quality, and operational efficiency in addition to a better competitive edge (Quayes, 2021). Additionally, successful financial performance of SACCOS leads to the accomplishment of profit maximization objectives, a reduction in the dependency rate, a better competitive edge, and the promotion of entrepreneurial endeavors, all of which contribute to economic development in a country (Bassem, 2012; Otieno, 2016). As a result of their good financial performance, SACCOs are able to improve the general welfare of the people that they serve by increasing the amount of money that is generated, as well as by reducing the amount of poverty that is experienced.

According to Sommer and Dyer (2014), the standard method for evaluating the performance of SACCOs is to investigate the institution's financial statements, which comprise a balance sheet, an income statement, and a statement of cash flows. In view of this, the return on equity (ROE) and Return on Assets (ROA) are some of the indicators that are utilized in the process of evaluating a company's financial performance. When

evaluating the financial performance of SACCOs, in addition to the level of capital adequacy and loan loss provision are other indicators of Saccos performance (Gonzalez, 2017). Also, the long-term viability of SACCOs is increasingly being assessed based on Environmental, Social, and Governance (ESG) factors (Mwabu & Kimani, 2018). The Return on Assets (ROA) of Saccos over the years have been as follows; 2016 was 2.45%, 2017 was 2.69%, 2018 was 2.40%, 2019 was 2.60%, 2020 was 2.65 % and 2021 was 1.59%.

According to Gweyi and Karanja (2014), financial performance of deposit taking Savings and Credit Co-operative Societies (DTS) denotes the degree to which a DTS is able to meet its policies in addition to both its financial and non-financial goals. According to Baraza (2018), managers can get assistance in determining whether or not a SACCO is profitable by analyzing the financial performance of deposit-taking SACCOs. According to Njoki (2018), a well-performing DTS will attract new members, which will ultimately result in an increase in the quantity of deposits. According to Franco-Santos, Lucianetti, and Bourne (2012), accurate measurement of a company's financial performance is essential to the effective management of any firm.

However, there is a widespread body of empirical research that demonstrates that SACCOs have abysmal financial performance. This is exemplified by low profitability, low portfolio quality, low operating efficiency, and excessive operating costs. According to the SASRA (2017), a large number of SACCOs have fallen short of meeting capital adequacy ratios, in addition to core capital to total deposit liabilities and core capital to total assets. According to the findings of a study that was conducted by Mugo, Muathe, and Waithaka (2018), low capital adequacy ratios might have a detrimental effect on the profitability of a company. SACCO, which takes deposits, is similarly confronted with



the difficulty of managing its portfolio of overdue payments. In 2017 and 2018, respectively, the portfolio's amount of overdue payments was 4.5 and 5.61%.

The results of previous study on the effectiveness of savings and credit cooperatives have been inconsistently positive and negative. Others reported evidence of a positive relationship, while others reported evidence of a negative relationship (Boardman et al., 1997; Vafeas, 1999; Xiao & Zhao, 2008; Moustafa, 2005; McConoughy et al., 1998; Murage, 2010; Lauterbach & Vanisky, 1999; Langat, 2006; Mutisya, 2006; Lauterbach & Vanisky, 1999). As a consequence, the findings are inconclusive; nonetheless, future research in this field would make the currently conducted empirical studies more robust. According to Sebhatu et al. (2021), cooperatives are "independent associations of members that band together voluntarily to fulfill their economic, social, and cultural ambitions through a collaboratively owned and democratically governed firm." They facilitate economic expansion and the pooling of members' incomes by purchasing, processing, packaging, and selling the members' agricultural products on their behalf. On a global scale, cooperatives are representative of a wide range of industries, including agricultural, insurance, banking, education, health and social work, consumer, community, government, transportation, and housing (Kai, 2021). Cooperatives are very prevalent in housing.

Liquidity management in Tier-1 SACCOs is an important aspect of financial management within these organizations (Sarkar, 2017). It involves maintaining sufficient cash flow to meet operating expenses and other obligations while minimizing risk and maximizing returns on investments. Proper liquidity management requires a clear understanding of the sources of funds, their use, and the associated risks. It also requires careful monitoring of cash flow, keeping track of deposits and withdrawals, and investing excess funds in short-term instruments. In addition, SACCOs need to have

sufficient liquidity to cover unexpected losses, such as bad debts or losses due to currency fluctuations (Kragh, 2018).

Liquidity management involves the ability of a SACCO to manage its current assets and liabilities in order to effectively meet its short-term obligations and ensure financial stability (Dube & Kanyinga, 2013). Poor liquidity management practices can lead to cash flow problems and inadequate capital to meet the SACCO's obligations. The financial performance of SACCOs is heavily influenced by their liquidity management practices, as poor liquidity management can lead to cash flow problems, inadequate capital, and ultimately decreased profitability (Mbithi, Oduor, & Odhiambo, 2011). A SACCO's liquidity management practices should be tailored to its specific business model and needs, and should include measures to ensure the availability of sufficient capital to cover all short-term obligations.

Strong liquidity management practices are associated with SACCOs with strong financial performance. Globally, the relationship between liquidity management and the performance of cooperative societies is inverse. Strong liquidity management practices are associated with SACCOs with strong financial performance. In recent years, liquidity has played an increasingly important role in SACCOs. After the 2008 financial crisis, liquidity risk has gradually come to be regarded as one of the most significant threats to SACCOs' viability. Liquidity is the capacity of a SACCO to finance asset growth and meet obligations as they mature without incurring unacceptable losses (Report of the Basel Committee on Banking Supervision, 2008). It indicates whether the Credit Union or SACCO is managing its cash to meet deposit, withdrawal, and liquidity reserve requirements while minimizing the amount of idle funds with no economic return (Kwadwo, 2001). Liquidity and its proper management in financial institutions have a significant impact on firms' efficiency and profitability.

The dilemma of liquidity management is to achieve the desired balance between liquidity and productivity/profitability (Raheman *et al*, 2007). There is no specific rule for determining the optimal level of liquidity that a company can maintain in order to have a positive impact on its profitability, as it depends on the nature of the company. Existing research on liquidity management has produced inconsistent results. Nabeel and Hussain (2017) discovered a significant positive correlation between liquidity and profitability in Pakistan's banking sector. Ibe (2013) found that liquidity has a negative effect on the profitability of Nigerian banks.

Akinwumi, Essien, and Adegboyega (2017) revealed mixed results of significant relationship between current ratio and Return on equity, but not that all significant with Return on Assets. Some studies established insignificant or no impact of liquidity on profitability. A study by Egbuhuzor and Ugo (2021) reported a negative and insignificant relationship between net profit margin and selected measures of liquidity in South African banks. In a similar study, Molefe and Muzindutsi (2016) found no impact of banks' profitability on major South African banks. Sile, Olweny, and Sakwa (2019) looked at banks in Kenya and found no statistically significant effect of liquidity on performance. Similar results were disclosed by Shrestha (2018) in their study on Nepalese commercial banks. Based on the above observations, it could be concluded that the impact of liquidity on financial performance among financial institutions remain vague and this calls for further research on the topic.

Board independence of Tier-1 SACCOs is a critical element of corporate governance to ensure the objectivity and integrity of the management of SACCOs. Board independence is defined as a situation where the board of directors of a SACCO is free of influence or control by management or the organizational owners in making decisions (Mwangi & Mungai, 2013). It is essential for a SACCO's board of directors to be independent in

order to ensure that the organization's objectives are met as efficiently and effectively as possible. In addition, it can also help to protect the interests of the members of the SACCO by providing an objective and unbiased decision-making process (Korir, 2019).

According to Akoto-Danso, Nti, & Issahaku (2017), board independence has been highlighted as a key factor to strong corporate governance, and effective management and performance of financial institutions. In particular, the literature has highlighted the impact of board independence on the financial performance of SACCOs. This is because SACCOs are unique financial institutions in that they are governed by boards of directors elected by their members, and the board members are typically members of the SACCO. Thus, the composition of the board and its independence are essential for the effective governance and financial performance of the SACCO.

For example, research has shown that SACCOs with larger percentages of independent board members tend to have better financial performance (Kironde, 2017). Additionally, studies have found that independent board members are more likely to challenge management decisions and advocate for more effective decision-making, thus leading to improved financial performance (Kironde, 2017). Board independence is fundamental for a firm in different ways; it improves company image, increases shareholders' confidence, and reduces the risk of fraudulent activities several studies are contributed to the effect of Board Independence on firm performance using different market developments. However, there is no consensus on the role Board Independence on firm performance, due to different contextual factors.

For instance, empirical have shown that board independence is positively associated with firm value or stock returns (Gompers *et al.*, 2003; Bebchuk *et al.*, 2004). Studies of asset prices and liquidity document a negative relation between stock return and liquidity

(Amihud & Mendelson, 1986; Amihud, 2002). The negative return-liquidity relation implies that firms with higher liquidity have lower costs of capital, and as a consequence, higher firm value, lower required returns from investors. Thus, board independence and liquidity management are two of the most important aspects of SACCOs (Savings and Credit Cooperatives) financial performance (Kamau, 2016). Board independence is important as it ensures that decisions made by the board are objective and in the best interests of the cooperative, while liquidity management ensures that the organization is able to meet its financial obligations in a timely manner (Gichohi, 2017). Both of these aspects have a significant impact on the overall financial performance of SACCOs.

## **1.2 Statement of the Problem**

SACCOs assume an essential role in elevating lives in the community through financial inclusion. The cooperative subsequently assumes a pivotal role in members' work creation and wealth creation which encourages poverty alleviation (Dana, 2010). In Kenya, Saccos are an imperative piece of the economy and are in charge of forty-five percentage of Kenya's gross domestic product with about twenty percent of the populace enlisted as a partner (Kirimi, Simiyu & Murithi, 2017).

An analysis of the financial performance of DT-SACCOS in Kenya reveals a worrying trend (Mwanja, 2021). The outstanding amounts of money are still very high and continue to have negative impacts on the financial performance and stability of SACCOs (Ntoiti & Jagongo, 2021). Membership in SACCOs remains an important performance and growth monitoring matrix, because as cooperative enterprises, SACCOs transact and undertake business only with the members. The Return on Assets (ROA) of Saccos over the years have been as follows; 2016 was 2.45%, 2017 was 2.69%, 2018 was 2.40%, 2019 was 2.60%, 2020 was 2.65 % and 2021 was 1.59% while the Non Performance Loans (NPL) was 5.23% in 2016, 6.14% in 2017, 6.30% in 2018, 6.15% in 2019, 8.39%

in 2020 and 8.86% in 2021. Whereas there was a marginal increase of 3.03% of the membership in SACCOs from 3.77 million members reported in 2019 to 5.99 million members in 2021 (SASRA, 2021). A large proportion of the members numbering 1.18 million were however reported as dormant implying that they had not conducted any transactions with their respective SACCOs for more than six (6) months. The total deposits for DT-SACCOs on the other hand declined from 13.41% in 2020 to 9.92% in 2021. The gross and net on the other hand stood at 10% and 8.35% respectively in 2021, compared to the growth rates of 13.16% and 12.60% respectively recorded in 2020. The sharp decrease in the growth rate of net loans and advances for DT-SACCOs in 2021 is largely informed by a sharp rise in the allowance for loan losses which increased by 40.77% to reach Kshs 34.05 billion in 2021 from Kshs 24.19 billion recorded in 2020 (SASRA, 2021).

Extant empirical reviews on liquidity management and financial performance have yielded mixed and inconsistent results. Some researchers have shown a positive and significant relationship (Edem, 2017; Naceur & Omran, 2011). Some have shown negative relationship (Marozva, 2015; Muriithi & Waweru, 2017) and others have shown no relationship (Salim & Bilal, 2016). Few studies that have been conducted in Kenyan context, have also yielded mixed results Lukorito, Muturi, Nyang'au, and Nyamasege (2014) established a positive and significant relationship while Maaka (2013) established a negative relationship. Corporate governance guidelines both in developed and developing countries have been established and implemented to strengthen and guide board decisions to avert corporate scandals and failures as well as reduce managerial opportunism.

Despite formation of SASRA to ensure observance of corporate governance and financial health of SACCOs, the sector continues to grapple with fraud, poor corporate

governance and mismanagement which can adversely affect the financial performance and sustainability of the SACCOs (Musau, 2020). Extant literature does not address the moderating effect of board independence on the relationship between liquidity management and financial performance of SACCOs. In light of the gaps set out in the preceding paragraphs and the value of saving and credit cooperative societies in the economic development, there remain unresolved issues on the relationships between the study variables in Kenya. This study sought fill the existing gap and establish the moderating effect of board independence on the relationship between liquidity management and financial performance of Saccos in Kenya.

### **1.3 Objectives**

#### **1.3.1 General Objective**

The purpose of this study was to establish the moderating effect of board independence on the relationship between liquidity management risks and financial performance of Savings and Credit Cooperatives (SACCOs) in Kenya.

#### **1.3.2 Specific Objectives**

The study was guided by the following specific objectives;

- i. To establish the effect of cash to deposit ratio on financial performance of SACCOs in Kenya.
- ii. To determine the effect of deposits to total assets ratio on financial performance of SACCOs in Kenya
- iii. To examine the effect of loan to deposit ratio on financial performance of SACCOs in Kenya
- iv. Examine the moderating effect of Board Independence on the relationship between:

- a) Cash to deposit ratio on the financial performance among SACCOs in Kenya.
- b) Deposits to total assets ratio and financial performance among SACCOs in Kenya.
- c) Loan to deposit ratio and financial performance among SACCOs in Kenya.

#### **1.4 Hypotheses**

The study was guided by the following research hypotheses;

**H<sub>01</sub>:** Cash to deposit ratio has no significant effect on financial performance of SACCOs in Kenya.

**H<sub>02</sub>:** Deposits to total assets has no significant effect on financial performance of SACCOs in Kenya

**H<sub>03</sub>:** Loan to deposit ratio has no significant effect on the financial performance of SACCOs in Kenya

**H<sub>04</sub>:** Board Independence does not moderate relationship between;

- a) Cash to deposit ratio and financial performance of SACCOs in Kenya
- b) Deposit to total assets and financial performance of SACCOs in Kenya
- c) Loan to total deposits ratio and financial performance among SACCOs in Kenya.

#### **1.5 Significance of the Study**

This research is important because it contributes to both theory and practice. First, the study's findings contribute to the body of knowledge on the relationship between liquidity management, board independence, and financial performance, thereby stimulating further discourse on the topic.



The findings could be utilized by policymakers such as SASRA and the Ministry of Industry, Trade, and Cooperatives to determine the impact of the various corporate governance mechanisms on the financial performance of the SACCO sector. They can incorporate the findings into their policies and interventions to ensure compliance with board independence practices and improve the financial performance of SACCOs. By understanding the impact of corporate governance on the performance of SACCOs, the boards of directors and management of DT-SACCOs will be better equipped to ensure compliance with the relevant requirements and avoid pitfalls that could threaten the organization's success.

Insights derived from this study offer managers the ability to optimize their liquidity strategies, ensuring sufficient funds to meet member demands while minimizing risks associated with illiquidity. Furthermore, understanding the role of board independence in financial performance empowers managers to establish governance structures that foster transparency, accountability, and prudent decision-making, ultimately bolstering members' trust and attracting potential investors. Embracing these insights enables SACCO managers to navigate the intricate landscape of liquidity challenges, governance dynamics, and financial sustainability, thereby paving the way for resilient and thriving cooperative institutions in the Kenyan financial landscape.

### **1.6 Scope of the Study**

The study was carried out among licensed deposit taking savings and cooperative societies in Nairobi County, Kenya. The study focused on the effect of cash to total asset ratio, deposits to total assets ratio and loan to total deposits ratio on the financial performance of DT SACCOS in Kenya. The target population comprised of all tier one deposit taking SACCOs in Nairobi Kenya. According to SASRA, there was a total of fourty-four (44) registered Tier- 1 deposit taking SACCOs in Kenya.

This study used of longitudinal explanatory research design. Data was secondary in nature on the study variables for the period between 2013 and 2022 was collected by use of a data collection schedule. Explanatory research designs were used to ascertaining the status and nature of liquidity management and establishing causal relationships between the independent and dependent variables respectively. The results of hierarchical multiple regression was used to test the moderating effect of board independence on liquidity management risks and performance of Tier-1 Saccos. Large-Tiered SACCOs as those Regulated SACCOs whose total assets are in excess of Kshs 5 Billion. Mid-Tiered SACCOs as those Regulated SACCOs whose total assets are between Kshs 1 Billion and Kshs 5 Billion; and Small-Tiered SACCOs as those Regulated SACCOs whose total assets are below the Kshs 1 Billion threshold. This study focused on 30 registered tier 1 Saccos out of a total of 185 saccos in all the three tiers. This represents 16.22 percent.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Overview**

The first section of this chapter introduces the concepts under liquidity management risks, board independence and financial performance. The second section presents the different theoretical foundations that elucidate the various determinants of financial performance. The third section captures the empirical literatures that have been done. The chapter ends with a critique of the reviewed literature and the presentation of a conceptual framework.

#### **2.1 Review of Concepts**

##### **2.1.1 Financial Performance**

Financial performance is the extent to which an organization achieves its financial objectives (Centobelli, Cerchione & Singh, 2019). Financial performance measures a firm's results in monetary terms. Institutions will implement the most advantageous financial and non-financial structures to gain a competitive advantage over rivals. From this competitive advantage, an institution will improve its financial performance, allowing it to meet its short- and long-term obligations, such as creating wealth for its shareholders. Inadequate financial performance can reduce an institution's appeal to potential investors, leading to its insolvency and eventual demise (Amalendu & Sri, 2011).

Different stakeholders evaluate the performance of a company from different perspectives. There are shareholders, managers, creditors, tax authorities, and other users who are invested in a company's performance. Shareholders invest in a company that will generate value for their capital. The management of an institution must maximize resource utilization in order to achieve strong financial performance. To evaluate the

financial performance of an institution, financial statements are used in conjunction with ratio calculations based on the user's needs. Profit after tax, Return on Assets (ROA), Return on Equity (ROE), and earnings per share are some of the most common financial performance metrics used by different stakeholders to evaluate performance.

Financial performance of SACCOs is a key measure of their success and sustainability. SACCOs, or Savings and Credit Cooperative Organizations, are financial institutions that provide savings, credit, and other financial services to their members. The organizations are often community-based and are typically owned and managed by the members themselves (Mabikke *et al.*, 2018). As such, the financial performance of SACCOs is of particular interest to investors, as well as to regulators, financiers, and other stakeholders who may have an interest in the organization's financial health. SACCOs have been found to have a strong impact on poverty reduction, economic development, and financial inclusion (Ndungu & Kiarie, 2017). Hence, careful assessment of the financial performance of SACCOs can help to ensure that the organization remains viable, and that its members and stakeholders receive the benefits they expect.

### **2.1.2 Liquidity Management**

Liquidity management is a set of actions taken by a financial intermediary as part of their day-to-day operations to ensure that they meet their obligations as they become due and to increase their profitability and shareholder wealth (Wuave, Yua & Yua, 2020). According to FSRA (2013), liquidity management is the ability of DT Saccos to meet all of their contractual obligations at a reasonable cost. The inability to meet obligations as they become due, as well as persistent illiquidity or liquidity stress, can lead to financial distress or even insolvency. Kimathi (2014) identifies liquidity as a crucial indicator of a SACCO's financial stability because it demonstrates the organization's capacity to meet

obligations as they become due. According to SASRA (2015), for DT SACCOs, the increased liquidity requirements are generally caused by member demand for loans, which, once qualified, is considered a right, unlike in the banking industry.

Liquidity management in SACCOs is an important measure that ensures the financial health of the organization. The ability to manage cash flows efficiently and effectively is a key factor in SACCOs' financial success and member satisfaction (Njoroge, 2020). Liquidity management helps SACCOs to provide short-term liquidity to members to meet their needs, while maintaining adequate cash reserves to cover future liabilities. It is also important for SACCOs to have an appropriate liquidity management framework in place that enables them to plan and manage their cash flows to ensure they are able to meet their obligations (Kagotho, 2019). Additionally, SACCOs should also be aware of the potential risks associated with liquidity management and develop strategies to manage these risks. Overall, liquidity management is an important component of SACCOs' financial health and success. By having an appropriate liquidity management framework in place and understanding the risks associated with liquidity management, SACCOs can ensure their financial stability and satisfaction of their members (Riro, Gatheru & Mutiso, 2020).

Liquidity management risks in SACCOs are risks associated with the management of financial resources that are available to the financial institution for immediate use (Khan & Chodapunedi, 2018). These risks include the risk of not having sufficient assets to meet short-term obligations and the risk of not having enough money to pay back loans and other liabilities when due. SACCOs can face liquidity risk due to a number of factors, including slow collection of receivables, large loan losses, high-volume borrowing, and inadequate capital (Bhattacharya & Pye, 2019). In order to manage these risks, SACCOs must have sufficient liquidity and must properly monitor their liquidity

position. It is also important for SACCOs to establish policies and procedures to ensure proper liquidity management (Wanjiru & Jagongo, 2022).

### **2.1.3 Board Independence**

Board independence or independent directors are internal governance mechanism premeditated to reduce the agency cost arising from the conflict of interest between the principal and the agent. Board independence refers to a corporate board with a majority of independent nonexecutive directors (Akpan & Amran, 2014). Independent board is vital in determining the board effectiveness because it reduces managers' discretion and opportunistic tendencies. The proportion of executive and nonexecutive directors to the board's total number is germane in enhancing board independence (Ilaboya, 2017). This empirical evidence supports the assertion of (Fama & Jensen, 1983) that independent directors in the board help to strengthen the internal control mechanism of the board.

There is a general consensus that when a board has a higher proportion of non-insider referred as outside or independent director (Mohamed *et al.* 2016), Farhan *et al.*, (2020) defined independent directors as directors who apart from receiving a director's remuneration do not have any other material pecuniary relationship or transactions with the company, its promoters, its management or its subsidiaries, in which the judgment of the board may affect their independence of judgment. Independence is not only a function of the proportion of inside to outside directors, rather it includes whether the board has dual leadership role and the degree of director share ownership. Like boards with heavy share ownership, boards with dual leadership are considered less independent (Kochen, 2021). An independent board is expected to be unbiased in carrying out its responsibilities. Lack of independency in the board may lead to agency problems as members in the board may not act in the best interest of shareholders (Hashim, 2012) .

Board independence in SACCOs is an important factor for the operational and financial health of the organization. According to the Kenya Union of Savings and Credit Co-operatives (KUSCCO) (2012), board independence is “a concept that prescribes a relationship between board members and the organization that is free of competing interests and undue influence.” This is achieved through the implementation of measures that ensure board members are not subject to undue influence from either internal or external stakeholders, and that they act independently in the best interests of the organization. The importance of board independence is also highlighted by the Kenya Co-operative Alliance (KCA) (2018), which states that “independent boards are vital for protecting the interests of members and ensuring that the organization is run in a competent and professional manner.” Therefore, it is essential for SACCOs to ensure that their board members are independent and that they are able to make decisions without interference from outside parties.

## **2.2 Theoretical Perspective**

Theories are proposed to explain, predict, and help comprehend occurrences and facts, as well as to challenge and expand existing knowledge within the bounds of certain limiting assumptions (Bartole, 2012; Swann, 2003). In research, a theory informs the problem, questions, and perhaps the study's objectives (Van der Vorm *et al.*, 2009). This study was grounded on the following theories:

### **2.2.1 Agency Theory**

Agency theory was propounded by Stephen & Mitnick (1973). Jensen and Meckling (1976) define the agency relationship as “a contract under which one or more persons (the principal(s) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent”. In their 1976 article “Theory of the firm: Managerial Behavior, Agency Costs and Ownership

Structure”, Jensen and Meckling (1976) helped establish the agency theory as the dominant theoretical framework of the corporate governance literature, and position shareholders as the main stakeholder, Agency theory as postulated by Smith & Verner, (2006). Agency theory proposes the most effective corporate governance approaches to handle the inherent conflict of interest between managers and shareholders.

It states that the board of directors is responsible for protecting the interest of shareholders through maximizing shareholder wealth. It is pointed out that managers involve in wrong decision making which does not increase the wealth of the firm. Jensen and Meckling (1976) stated that it is thus important for the directors to observe the management action to mitigate the misappropriation of assets. Agency theory proposes the most effective corporate governance approaches to handle the inherent conflict of interest between managers and shareholders. It states that the Board of directors is responsible for protecting the interest of shareholders through maximizing shareholder wealth.

According to agency theory, boards should act as watchdogs to align the manager’s interests with the shareholders’ interests (Fama & Jensen, 1983) and monitoring and control of the management is seen as the main role of the board thus reducing agency costs. Agency theory assumes that shareholders respond to the problems they face in two ways. Firstly, they may increase monitoring to reduce information asymmetry and to ensure that managers are making as great an effort as possible to maximize the company’s wealth. Secondly, they may introduce an incentive scheme for management that will align the interests of managers and shareholders and encourage managers to perform to their optimum as it in their best interests, which at the same time maximise shareholder wealth. The board hence acts as a control measure to prevent management



excesses and ensure management conducts their activities responsibly and competently and it does not use its discretion inappropriately.

Agency theory can provide useful insights into a study on board independence and financial performance of SACCOs. Agency theory looks at how principals (owners) and agents (directors) interact in the firm, and how the different interests of these two groups can lead to agency problems. In the case of SACCOs, the board of directors is elected by the members, who are the ultimate owners of the SACCO. However, the board is meant to act as an independent voice for the good of the SACCO, rather than for the personal benefit of the members.

In this context, agency theory informs this study by examining the incentives of the board members, and how independent decision-making can affect the financial performance of the SACCO. The study examines how the board of directors seeks to minimize agency costs, such as monitoring costs, to ensure the financial performance of the SACCO remains strong. Similarly, the Agency theory is applicable to this study as it tries to align the interests of shareholders and those of the government and the regulator, SASRA. To increase members returns and ensure better financial performance, managers can be compensated through performance-based compensation plans as well as having close monitoring and where necessary, intervention by the members.

### **2.2.2 Liquidity Preference Theory**

This theory was put forward by John Maynard Keynes (2011). Liquidity preference refers to the amount of money the public is willing to hold given the interest rate. Keynes argued that there are three reasons for holding liquid assets. First, they act as ordinary transactions, second they act as a precaution against a rainy day, and third they are used for speculative purposes. Keynes showed that transaction deposits vary inversely with

the rate of interest. The main argument in this theory is that at very low interest rate, an increase in the money supply does not encourage people investment but instead increases cash balances. The reason is that people expect the interest rate to rise later. This theory is based on the idea that investors demand a premium for securities with longer maturities, which entail greater risk, because they would prefer to hold cash, which entails less risk; hence, the more liquid an investment is, the easier it is to sell quickly for its full value (Wessels, 2000).

The main goal of the theory is to connect assets and liabilities in hedging liquidity risk. The liquidity preference theory informs this study by explaining the reasons why investors prefer liquidity over other investment options. The theory states that investors prefer liquidity because it provides them with greater flexibility to make financial decisions, such as buying and selling assets, and to access cash when needed. It also helps them to reduce the risk of holding illiquid assets and to maximize returns on their investments. Therefore, when analyzing the liquidity management and financial performance of SACCOs, researcher can use the liquidity preference theory to understand the relationship between liquidity and financial performance. This can help them to identify the best practice approaches to managing liquidity and provide recommendations for improving financial performance.

## **2.3 Empirical Review**

### **2.3.1 Cash to deposit ratio and financial performance of SACCOs**

Liquidity risk, as defined by Otwoko and Maina (2021), refers to the possibility that an organization may be unable to obtain the cash necessary to meet its short-term and intermediate-term obligations. Liquidity risk is posed to deposit-taking Savings and Credit Cooperative Organizations (SACCOs) when these organizations are unable to fund their operations and meet the lending requirements of their members as and when

the circumstances call for it. Their study provided an in-depth analysis of the influence that liquidity risk has on the optimal operating and financial performance of deposit-taking SACCOs in Kenya. This is significant in light of the fact that liquidity is an important factor in determining both of these factors. In this study, a descriptive survey design was adopted, and regression methods were utilized, in order to model the relationship between liquidity risk and the financial performance of DT SACCOs. The significance level of the data was set at 5% throughout the analysis. According to the findings of the research, liquidity risk exerted a statistically significant influence on the financial performance of deposit-taking SACCOs at a level of significance equal to 5%. In light of the findings, Deposit-taking Savings and Credit Cooperative Organizations (DT SACCOs) are strongly urged to place a primary emphasis on increasing the volume of deposits they receive in order to keep their asset portfolios at a level that minimizes the risk of liquidity.

In Kenya, a study that was carried out by Njeru, (2016) investigated the influence that cash management had on the financial performance of deposit-taking SACCOs. The sampling method used was simple random sampling, and the sample size was 92 people who responded to the survey. The target audience consisted of thirty SACCOs in Kenya that were licensed to accept deposits. In order to gather information on the effects of liquidity management on the financial performance of deposit-taking SACCOs in Kenya, the research presented here utilized a descriptive survey as its data collection method. Utilizing self-administered structured questionnaires allowed for the collection of the primary quantitative data. In addition to that, the researcher made use of secondary data, which was gathered from the audited financial statements of the SACCOs as well as the regulator (SASRA). Both descriptive and inferential statistics were utilized in the process of analyzing the acquired data in relation to the aims of the study. Descriptive statistics

such as mode, median, mean, and standard deviation were utilized in the examination of the data. The F-test statistics were utilized in order to validate the research hypothesis. Cross tabulation was carried out with the assistance of SPSS in order to ascertain the nature of the relationships that exist between the variables. Correlation was established. The association between SACCOs' liquidity management and their financial performance was investigated using univariate and multiple regression analysis, respectively.

The information was laid down in the form of tables, charts, figures, and mathematical formulas. The findings demonstrated that although SACCOS make careful cash flow forecasts, there are external factors that can influence cash management, which creates a bigger risk for the institutions' day-to-day operations. As a result, it is necessary to conduct an in-depth critical examination of the cash management elements that exist within the institution as well as those that exist in the external environment because both of these environments have the potential to have an impact on cash management within the institution. The high level of the gross loan portfolio indicated that members had a significant demand for loans, which validates the primary mission of deposit-taking SACCOS, which is the issuing of loans to the organization's members. This demonstrated that management had taken preventative steps with regard to the management of the gross loans and that they had a pessimistic outlook on the risks associated with keeping a large amount of gross loan on their books. Due to the fact that external financial variables such as inflation and macroeconomic factors have less of an effect on the cash management of the institution, which in turn has less of an effect on financial performance in deposit-taking SACCOs, members' contributions played a key role in generating the needed cash for the loans that were issued by the SACCO to their members.

This indicates that the levels of risk that the SACCO faces are manageable, and it also indicates that the SACCO is able to issue loans to its members. The high level of demand for cash from members in the form of loan requests led to an insufficient amount of excess cash for varied investments. This could also suggest a shortage of investment capacity among SACCOs, which would result in less diversification on the many options that are now accessible on the market. Since SACCOs appear to be paying dividends at a rate that is higher than the market rate, the SASRA needs to come up with an efficient policy that will provide direction on dividend payment for SACCOs. Although this may appear to be highly profitable in the short run, in the long run it will have a detrimental impact on the financial performance and stability of SACCOs. Because of this, it is essential for the SACCO regulator to promote and raise awareness of its actions in the industry. This is extremely important because it will lower the financial risk associated with investments in the SACCO sector and increase the motivation of many more individuals to put their investments in the SACCO in the growing sector. This will have a positive effect on the sector as a whole and contribute to the growth and achievement of a middle income economy, as outlined in vision 2030.

The study came to the conclusion that there is a need to implement cash management controls in SACCOs; there is a need to better strengthen the role of SASRA and increase its awareness; there is a need to implement credit management policy; and finally, there is a need to increase the monitoring role of the government through its regulator in the sector because the sector plays a critical role on the accomplishment of vision 2030 and improved economic development of the members.

Studies have shown that high default rates can have negative impacts on a Sacco's financial performance and may lead to reduced access to credit for members. This can lead to a decrease in a Sacco's ability to provide services to its members, such as access

to financial products and services (Kamau, 2018). Additionally, high default rates can also affect the ability of a Sacco to attract new members. In order to address these issues, Sacco's have implemented various strategies to reduce the default rate and improve their financial performance. These strategies include the introduction of credit scoring systems, increased monitoring of loan applications, and improved loan recovery processes (Kamau, 2018).

The empirical literature has shown that loan default can have a negative impact on SACCOs' financial performance. For example, a study conducted in Kenya by Ochieng (2012) found that loan default was significantly associated with reduced profitability and liquidity of SACCOs. In particular, Ochieng (2012) found that loan default was associated with lower profitability, as measured by the return on assets, and lower liquidity, as measured by the ratio of cash and cash equivalents to total assets. The findings of this study suggest that loan default can reduce the financial performance of SACCOs by decreasing their profitability and liquidity.

In addition, a study conducted in Ethiopia by Belay (2011) found that loan default was significantly associated with reduced financial performance of SACCOs. Specifically, Belay (2011) found that loan default was associated with a decrease in the return on assets and the return on equity of SACCOs. By reducing the returns on assets and equity, loan default can negatively impact the financial performance of SACCOs. Overall, the empirical evidence suggests that loan default can have a negative impact on the financial performance of SACCOs. This suggests that SACCOs should take measures to reduce their loan default rates in order to maintain their financial performance.

Cash conversion cycle (CCC) is a metric used to measure a firm's operating efficiency, by examining the amount of time required to convert the firm's resources into cash

(Caglar & Ozsoy, 2017). Specifically, CCC looks at the three main activities involved in generating cash flow: inventory, accounts receivable, and accounts payable. The metric is calculated by subtracting the time required to convert raw materials into inventory (days inventory outstanding), from the time needed to convert inventory into accounts receivable (days sales outstanding) and then subtracting the time required to convert accounts receivable into cash (days payable outstanding). A low CCC indicates a firm is efficiently managing its resources, whereas a high CCC indicates that the firm is not efficiently managing its resources (Okelwa & Ngamau, 2017).

The CCC metric is particularly useful for financial performance analysis of Savings and Credit Cooperatives (SACCOs). These are organizations that provide a range of financial services to members, including savings, lending, and insurance. As SACCOs are largely dependent on their members' deposits for their cash flow, it is important for them to efficiently manage their resources in order to ensure they have sufficient funds available to meet their obligations. Thus, CCC can be used to measure the efficiency of SACCOs in transforming their resources into cash and in turn, their financial performance (Muganda *et al.*, 2015).

By analyzing CCC, SACCOs are able to identify and address any inefficiency in their resource management process. This can help them to improve their financial performance and ensure that they have sufficient funds to meet their obligations. Furthermore, by keeping CCC low, SACCOs can reduce their financing costs, as they will not need to rely as heavily on external sources of financing such as loans or equity (Caglar & Ozsoy, 2017). In conclusion, CCC is a useful metric for financial performance analysis of SACCOs. By analyzing CCC, SACCOs are able to identify and address any inefficiencies in their resource management process, which can help them to improve their financial performance and reduce their financing costs.

### **2.3.2 Deposit to Total Asset and Financial performance of SACCOs**

According to the findings of a study that was carried out by Keben and Maina (2018), effective management of liquidity has a considerable and favorable impact on financial performance. The purpose of their study was to assess the influence that liquidity risk management, such as deposit levels and cash levels, has on the financial performance of deposit-taking SACCOs in the county of Uasin Gishu in Kenya. This study utilized the liquidity risk theory as its foundation. The study design that was used was a cross-sectional survey. The target demographic consisted of all of the SACCOs in Kenya that were authorized to accept deposits. The group that was considered eligible for access was comprised of high-level managers and middle-level cadre workers in Uasin Gishu County's registered savings and credit cooperatives that accept deposits. They employed an approach that involved sampling in two stages. In the study, researchers used purposive sampling to choose three top-level managers and one operation manager from each of the 10 DTSSs that were sampled. On the other hand, researchers used simple random sampling to select credit officers and accountants. The researcher used Slovin's method to determine the appropriate size of the sample. As a consequence of this, a total of 63 individuals agreed to participate in the study. In the study, primary data were gathered through the use of questionnaires, while secondary data were gathered through journal articles. Research experts were utilized to assess the questionnaire items in order to determine the validity of the questionnaire items, and the research experts' ideas and criticisms were used as a basis for modifying the research items. As a method of determining dependability, the Cronbach alpha coefficient was applied. When the number was more than 0.7, it indicated that the research equipment were reliable. Inferential statistics, including multiple regression and correlation, were utilized in the process of conducting the analysis on the gathered data. The use of frequencies,



percentages, the mean, and the standard deviation were all components of descriptive statistics. Tables and charts were utilized in order to convey the data.

According to the findings of the research, a significant factor that improves the financial performance of SACCOs in Uasin Gishu County, Kenya, is liquidity risk management ( $t = 8.037$ ;  $\text{sig} = 0.000$ ). According to the findings of the study, effective and powerful governance is necessary for the process of liquidity management practices since these activities are significant enough to be relevant.

According to Kinyua (2013), SACCOs serve a crucial role in Kenya's financial system as intermediaries. They concentrate primarily on the personal development, small business, and microbusiness sectors of the economy. SACCOs are member-owned financial institutions that provide deposits and credit to their members. They take monthly payments for shares from members, which form a pool of funds to meet members' credit needs. SACCOs are a significant component of the financial sector in terms of access to credit, mobilization of savings, and creation of capital. The purpose of this study was to establish a connection between the financial performance and magnitude of SACCOs in Kenya. The objective of their study was to determine whether the scale of SACCOs, as measured by total assets, deposits, and turnover, influences their financial performance, as measured by the return on asset ratio.

The study employed a descriptive survey design, and its population comprised all deposit-taking SACCOs in Kenya that were licensed by SASRA as of December 2012. Stratified sampling was utilized to select a sample of 30 SACCOs from a population of 124 SACCOs. Based on the value of their assets, the sample was comprised of all three sizes of SACCOs: large, medium, and minor. The study utilized secondary data compiled by SASRA offices. The data was extracted from the audited

financial statements of the SACCOSs, and the study period spanned 2009 to 2012. A regression model and correlation analysis were used to establish the relationship, and the ANOVA statistic was employed to test the model's significance. The study concluded that there was a strong correlation between financial performance and the magnitude of SACCOS in Kenya, as indicated by an adjusted R<sup>2</sup> of 0.895%, which indicates that total assets, savings/deposits, and turnover accounted for 89.5% of the variation in return on assets. As it was less than  $\alpha=0.05$ , the probability value of 0.005a indicated that the regression model was significant for predicting the relationship between return on assets and predictor variables. The study found that savings/deposits played a significant influence in determining the financial performance of SACCOSs. This study recommends that the management of SACCOS develop strategies for increasing savings/deposits. This could be accomplished by increasing SACCOS membership. Members' contributions constitute the savings/deposit in SACCOSs, which are used to extend loans to members, while members also serve as a ready market for the loans. The majority of SACCOS' total assets consist of loans, and these assets are used to generate future revenues.

### **2.3.3 Loans to Total Asset and Financial performance of SACCOS**

According to a study by Ndiege et al. (2015), Savings and Credit Cooperative Societies (SACCOS), which are cooperative financial models, have recently flourished in the majority of developing economies. However, their ability to repay loans remains a challenge that jeopardizes their future. Using financial statements for the year 2012 from 36 SACCOS in Tanzania's Kilimanjaro Region, the study analyzed the relationship between financial performance and loan repayment capacity using descriptive statistics and regression models. Thus, it investigated the extent to which SACCOS are capable of recovering the issued loan, as well as the financial ratios that explain SACCOS' loan

repayment capacity. The study revealed that SACCOs in Tanzania have a significant problem with financial risk management. Focusing on sustainability is crucial for enhancing loan repayment, whereas focusing on profitability in SACCOS has a negative effect on loan repayment. The study asserts that the primary objective of SACCOS should not be profit, but rather the maximization of member wealth and the institution's viability. In addition to the traditional methods of managing financial risk, the researchers found that the use of a modern risk management instrument such as credit scoring should be considered when evaluating borrowers.

Loans remittance to Savings and Credit Cooperative Organizations (SACCOs) has been linked to their financial performance (Kamau *et al.*, 2018). Studies have revealed that delayed remittance of funds leads to reduced liquidity in SACCOs (Muganda *et al.*, 2015). This in turn affects their ability to provide financial services, and affects their financial performance. In addition, delayed remittance of funds has a negative impact on the SACCOs' ability to attract new members and increase their capital base (Muganda *et al.*, 2017). Furthermore, delayed remittance reduces the SACCOs' ability to finance large-scale projects, which could lead to increased income and improved financial performance (Kamau *et al.*, 2018).

The impact of delayed remittance on SACCOs' financial performance is not limited to just reduced liquidity. Studies have shown that delayed remittance affects the SACCOs' ability to finance their operations (Muganda *et al.*, 2015). This is due to the fact that SACCOs rely heavily on the remittance of funds to finance their activities. Delayed remittance of funds can lead to increased costs and reduced profits, which can negatively impact the financial performance of SACCOs (Kamau *et al.*, 2018). In addition, delayed remittance can lead to a decrease in the quality of services offered by SACCOs, which can also lead to a decrease in their financial performance (Muganda *et al.*, 2017).

Overall, delayed remittance of funds has a negative impact on the financial performance of SACCOs. This is due to the fact that it reduces the SACCOs' liquidity, affects their ability to attract new members, and reduces their ability to finance large-scale projects. In addition, it increases their costs and reduces their profits, and can lead to a decrease in the quality of services offered. Therefore, it is important for SACCOs to ensure timely remittance of funds in order to maintain their financial performance.

#### **2.3.4 Board independence and financial performance**

Rooly (2022) examined the impact of board composition on shareholder wealth in line with the agency and resource dependency theory approach due to the poor corporate governance practices leading to investors' lack of confidence. The study samples included companies listed on the Colombo Stock Exchange in Sri Lanka. The banks and financial institutions were excluded from this study. The study period consists of seven years, and a final sample of 175 companies was selected for the analysis. E-View 9 statistical software was used to test the association between Board composition-related variables and shareholder wealth. The findings revealed that board size, separate leadership structure, and proportion of non-executive directors on the Board positively influence shareholder wealth. At the same time, a separate leadership structure also tends to enhance the shareholder wealth of companies. It is noted that a large board and a higher proportion of non-executive directors on the Board would benefit shareholders, which supports the theoretical prediction of agency and resource dependency theories and the code of best practices on corporate governance in Sri Lanka. The result related to women's representation on the Board does not significantly influence shareholder wealth since the gender balance was not prioritized in Sri Lankan listed companies.

Muhando (2022) assessed the relationship between board composition and the performance of five-star hotels in Kenya. The study was anchored on the situational

leadership theory. The study adopted a descriptive research design. The findings revealed that board composition had a positive and significant effect on the performance of five-star hotels. The study concluded that there exists a positive significant relationship between board composition and performance of five-star hotels in Kenya. The study recommends that board composition needs to be facilitated to improve the performance of five-star hotels in Kenya.

Tanui and Tenai (2022) sought to establish the effect of board composition on capital structure among listed firms in Kenya. The study adopted an explanatory research design. The target population for the study was 44 tier 1 firms. The study analyzed data for six years between 2007 and 2012 drawn from a sample of 34 companies. The findings indicated that non-executive directors had a negative and significant effect on capital structure. Thus, a higher number of non-executive directors will have low gearing levels. Also, board tenure significantly affects the capital structure, this implies that increasing or decreasing board tenure has an effect on capital structure. The presence of non-executive directors improves the firm's reputation hence making more profits which is the major concern of shareholders. Further, as directors acquire firm-specific knowledge early in their tenure, the result is better firm performance.

Abdirashid (2021) sought to establish how the board composition affects the Kenyan commercial banks financial performance. The study achieved this by examining the theories and empirical works that has been undertaken with regards to establishing the magnitude degree and impact of board composition on the commercial banks' financial performance. The study target population comprised of the 42 commercial banks licensed in Kenya. The researcher used secondary data. The panel data was acquired for the period of the study with unit of analysis being a year. The researcher analyzed the data for inferential statistics that involved correlation and regression analysis. Panel

multiple regression equation was done employing use of estimation method of Ordinary Least Square in order to find out the association amongst board composition and the bank size which was the control variable to the commercial banks' performance. The study findings revealed that board independence negatively and significantly related with financial performance. Further findings found out that bank size had as positive and significant association with the bank's financial performance. The recommendations of the study were that the CBK and the National Treasury ought to ensure that commercial banks implement corporate governance principles which guarantee that there is suitable board composition which is in compliance with corporate governance code.

### **2.3.5 Moderating effect of board independence on relationship between Liquidity management and financial performance of SACCOs**

Previous studies have found that board independence can play a significant role in improving financial performance (Riley, 2018; Tkachenko & Kalyuga, 2016). Specifically, board independence has been found to reduce risk taking and increase monitoring of management decisions, resulting in improved liquidity management and subsequent increased financial performance. Moreover, the literature suggests that the relationship between liquidity management and financial performance of SACCOs is further strengthened by board independence (Njuguna *et al.*, 2016).

Similarly, Njuguna *et al.*, (2016) found that the moderating role of board independence increases the association between liquidity management and financial performance of SACCOs. These findings suggest that board independence can enhance the positive relationship between liquidity management and financial performance of SACCOs. In summary, the literature suggests that board independence can have a positive moderating effect on the relationship between liquidity management and financial performance of SACCOs (Kamau & Mwangi, 2017; Njuguna *et al.*, 2016; Riley, 2018; Tkachenko &

Kalyuga, 2016). Other recent studies have highlighted the moderating effect of board independence on the relationship between liquidity management and financial performance of SACCOs (Kamau, 2018; Kewa, 2017). Kamau (2018) found that board independence positively moderates the relationship between liquidity management and financial performance of SACCOs, and that the strength of the relationship increases with the level of board independence.

Kewa (2017) further observed that the liquidity management practices of SACCOs are more effective in improving financial performance when the board is highly independent. This suggests that the presence of an independent board of directors is a key factor in ensuring that the liquidity management practices of SACCOs are effective in improving financial performance. Board independence can help to reduce risk taking and improve monitoring of management decisions, which can lead to improved liquidity management and increased financial performance of SACCOs. Therefore, it is important for SACCOs to ensure that their boards are sufficiently independent in order to enhance the relationship between liquidity management and financial performance.

## **2.4 Control Variables**

### **2.4.1 Firm size and financial performance**

Firm size and age have been identified as important control variables of financial performance for Savings and Credit Cooperatives (SACCOs) (Odhiambo, 2011). A number of studies have been conducted to investigate the influence of firm size and age on the financial performance of SACCOs. Most of these studies have found that firm size has a positive effect on financial performance while age has a negative effect (e.g., Asongu & Nwachukwu, 2018; Muchemi & Wanjiru, 2016). Chi (2004) clarified the relationship and concluded that organizational size is having significant impact on performance as well as rights of the shareholders. Larger firms have better chances to

obtain credits from financial institutions. They may obtain loan at cheaper rates, as they have better credit worth and low chances of bankruptcy.

According to Atmaja (2008) firm size is a scale that classifies the size of a firm using various modes: total assets, log size, stock market value, total sales and the like. Higher total assets and sales of the firm show the turnover of funds in the firm. The higher the total assets, the greater the capital the firm invests. On the basis of the descriptions, it can be stated that firm size is the number of assets a firm hold. Literature reveals a correlation between firm age and financial performance. The nature of this relationship varies depending on the market, and the size of the firm examined. For example, in the Asian market, larger firms are more productive but less profitable, while older enterprises are less productive and more profitable (Majumdar 1997). The argument is that firms' performance improves with age.

In a study by Asongu and Nwachukwu (2018), firm size was found to have a significant positive effect on financial performance. The results revealed that an increase in firm size leads to an increase in financial performance. The authors suggested that larger firms are able to access lower borrowing costs and are able to benefit from economies of scale and scope. On the other hand, age was found to have a negative effect on financial performance (Muchemi & Wanjiru, 2016). The authors proposed that this could be due to the fact that older firms are likely to be less innovative than their younger counterparts and therefore are unable to keep up with the changing market conditions.

#### **2.4.2 Firm age and financial performance**

Firm age has been identified as important control variables of financial performance for Savings and Credit Cooperatives (SACCOs) (Odhiambo, 2011). A number of studies have been conducted to investigate the influence age on the financial performance of



SACCOs. Most of these studies have found that firm age has a negative effect (e.g., Asongu & Nwachukwu, 2018; Muchemi & Wanjiru, 2016).

Furthermore, older firms may have outdated business models which make them less competitive. Overall, the empirical evidence suggests that firm size and age have a significant impact on the financial performance of SACCOs. Larger firms are likely to have better financial performance due to their ability to benefit from economies of scale and scope, while older firms are likely to have poorer financial performance due to their lack of innovation and outdated business models (Asongu & Nwachukwu, 2018; Muchemi & Wanjiru, 2016; Odhiambo, 2011).

## **2.5 Research Gap**

From this review of empirical literature, it is clear that there is a growing body of research investigating liquidity management and the performance of saccos (Akinwumi *et al.*, 2017; Alhassan & Islam, 2021; Edem, 2017; Egbuhuzor & Ugo, 2021; Kai, 2021; Keben & Maina, 2018; Kipnetich, 2019), and the number of related studies continues to increase. However, the majority of these studies have concentrated on the developed nations of Asia, the United States, the United Kingdom, India, and a few countries in Africa (Edem, 2017; Marozva, 2015; Molefe & Muzindutsi, 2016; Salim & Bilal, 2016; Sathyamoorthi *et al.*, 2020). In addition, existing studies have produced contradictory and inconclusive results. Also, the majority of these studies have examined the direct relationship between the variables. Generalizing these findings to East African developing nations could lead to erroneous conclusions. Few studies have investigated the moderating effect of board composition on the association between liquidity management and financial performance.

Though several studies have been conducted in the context of Kenya (Kipngetich, 2019; Lukorito et al., 2014; Maaka, 2013). Majority focused on banking and insurance companies. Furthermore, previous empirical research has not emphasized the moderating variable being investigated in this study. Existing empirical research also exhibits methodological inconsistencies. While the majority of examined empirical studies employed a descriptive research design and a panel approach, others utilized a mixed-methods or cross-sectional approach. In addition, some researchers utilized secondary data sources, while others utilized primary data sources or a combination of both. As a result, this work sought to address the theoretical, conceptual, contextual deficiencies outlined in this document.

## 2.6 Conceptual Framework

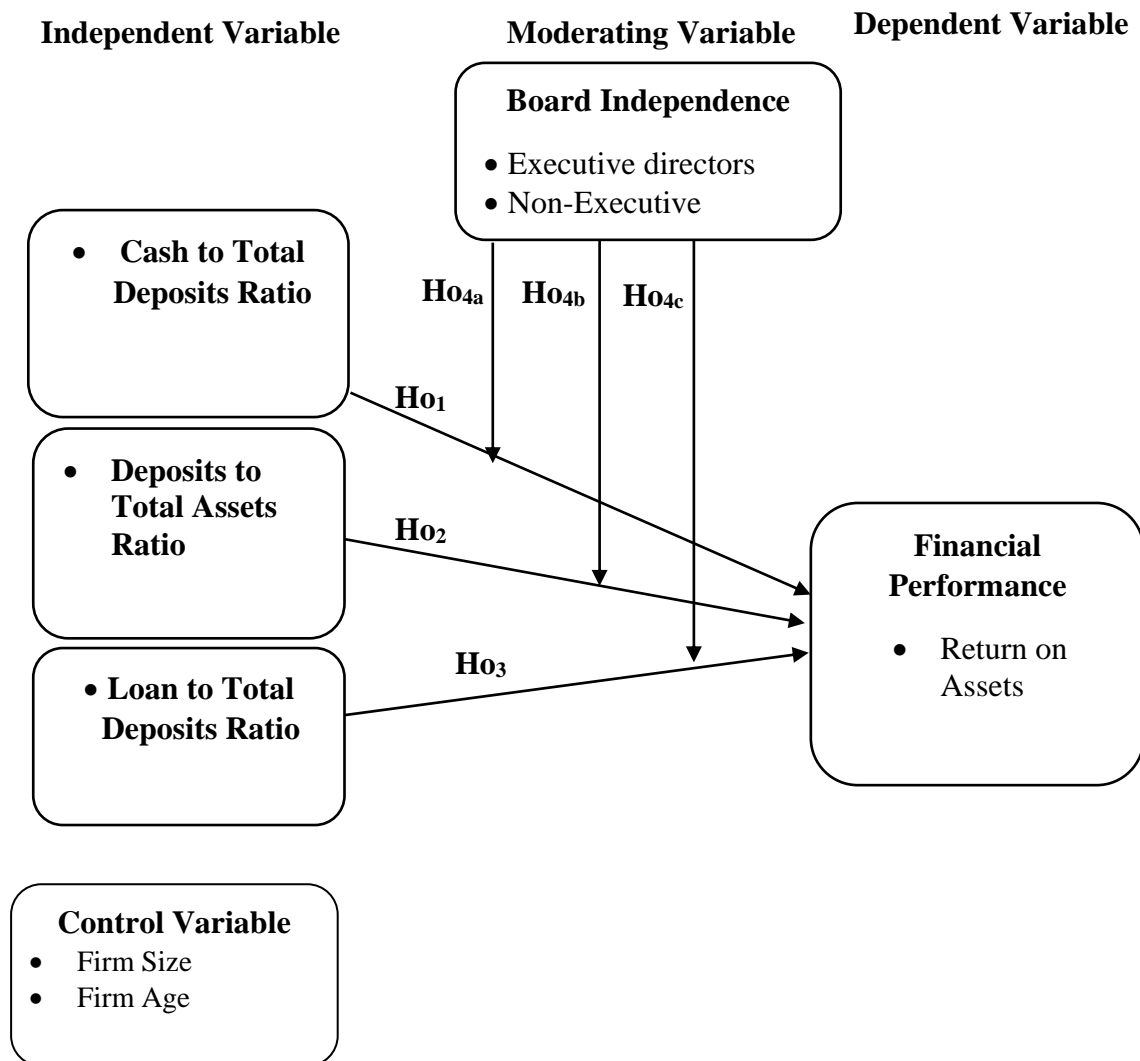


Figure 2.1: Conceptual Framework Diagram

Source: Researcher, 2023

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Overview**

The focus of this chapter was on the research design, study area, target population, sample size, sampling techniques, data collection instruments and procedures, measurements of the variables of the study, reliability and validity of the instruments, data processing, analysis, presentation, and the ethical consideration.

#### **3.1 Research Design**

A research design was the conceptual framework within which research is conducted; it served as a road map for data collection, measurement, and analysis (Kothari, 2004). Components of research design included sample procedures, research strategies, instruments, and methods for gathering evidence, analyzing data, and reporting conclusions. This research employed a longitudinal and explanatory design. The longitudinal research design was deemed appropriate because it collected numerical data on the same variable over an extended period. This design was optimal for this study because it considered panel data for the ten-year period from 2013 to 2022. A common application of an explanatory research design was to determine the cause-and-effect relationship between variables (Kassa, 2021). Because this study sought to establish the moderating effect of board independence on the relationship between liquidity management risks and financial performance of Savings and Credit Cooperatives (SACCOs) in Kenya, an explanatory research design was ideal.

#### **3.2 Target Population**

The target population is defined as the specific population containing all of the elements of interest to the study. According to (Ngechu, 2017), a population is a defined set of

people, services, elements, events, and a group of things or households being investigated. All Tier -1deposit-taking SACCOs in Kenya were the target population. Kenya has a total of forty-four (44) registered Tier- 1 DT SACCOs that accept deposits, as reported by SASRA. SACCOs that accept deposits were chosen because they are closely regulated by SASRA and required to observe corporate governance in order to safeguard the savings and deposits of their members. Nevertheless, application of inclusion and exclusion criteria left thirty Saccos as eligible for carrying out analysis. The inclusion and exclusion criterion was based on whether the firm was in operation from 2013 to 2022. Additionally, the inclusion/ exclusion criteria also considered Tiered 1 SACCOs as those Regulated SACCOs whose total assets are in excess of Kshs 5 Billion. This period was suitable since it was during this period that SASRA enacted regulatory framework requiring SACCOS to observe corporate governance in order to safeguard the savings and deposits of their members. The time period considered was appropriate because the Kenyan SACCO sector underwent significant regulatory and institutional changes as a result of the global financial crisis. Basel III reforms were implemented during this time period in response to the global financial meltdown. SACCOS that have undergone financial distress and placed under receivership were excluded.

### **3.3 Data Types and Sources**

The study used secondary data that were extracted from annual reports and financial statements from SASRA supervisory reports and Saccos the annual audited financial reports prepared by Tier-1 DT SACCOs for the 10-year period from 2013 to 2022. This period was significant in the sense that it was during this period that the oversight role of SASRA on a regulatory framework that covers various operational aspects including shares, savings and deposits; governance; licensing; liquidity and asset liability

management; credit management; capital adequacy; risk classification of asset and provisioning; investments; financial performance reporting; regulation and supervision; information preservation and business continuity; and Deposit Guarantee Fund management was implemented. The audited financial reports were downloaded from the individual Sacco's website and also SASRA supervisory reports. Additionally, data collection process was guided by a data collection schedule. Secondary data are beneficial for enhancing comprehension and describing the study's problem, as well as offering more information to help solve a problem (Ghauri & Gronhaug, 2005). Secondary data is also more reliable and objective compared to primary data (Sekaran & Bougie, 2019); Vartanian (2010).

### **3.4 Operationalization and Measurement of Variables**

Operationalization is the process of assigning numerals, numbers and other symbols to the study variables. According to Sekaran (2006), operationalization is the explicit specification of a variable in such a way that its measurement is possible.

#### **3.4.1 Dependent Variable**

Return on Assets (ROA) is a financial ratio used to evaluate a company's efficiency in generating profits from its total assets (Kurniawan, 2021). It is calculated by dividing the company's net income by its average total assets during a specific period. ROA provides insight into how effectively a company utilizes its assets to generate earnings. A higher ROA indicates that the company is generating more profits from its asset base, which is generally favorable for investors and stakeholders. Conversely, a lower ROA may suggest inefficiencies in asset utilization or lower profitability. ROA is commonly used by investors, analysts, and lenders to assess a company's financial performance, compare it with industry peers, and make informed decisions regarding investment, credit risk,

and overall business health. It calculated by dividing net income with the total assets and was given the following formula:

$$ROA = \text{Net Income} / \text{Total Assets}.$$

### **3.4.2 Independent Variable**

#### **3.4.2.1 Cash to Deposit Ratio**

"Cash to Total Deposit" is a financial ratio that measures the proportion of a company's total deposit that are held in cash (Sánchez & Yurdagul, 2013). It indicates the extent to which a company holds liquid assets (cash and cash equivalents) relative to its total deposit, which helps assess its liquidity and financial strength. It is calculated using the following formula:

$$\text{Cash to Total Asset ratio} = \frac{\text{Cash}}{\text{Total Deposit}}$$

#### **3.4.2.2 Deposit to Total Assets**

The "Deposit to Total Assets Ratio" is a financial metric used to assess a bank's or financial institution's deposit activities and liquidity position (Rawan, 2019). It measures the proportion of a bank's total deposits relative to its total assets. The ratio indicates how much of the funds deposited by customers available relative to total assets of the firm.

$$\text{Total Deposits to Total Asset ratio} = \frac{\text{Total Deposits}}{\text{Total Assets}}$$

#### **3.4.2.3 Loan to Total Deposit Ratio**

The "Loan to Total Deposits Ratio" is a financial metric used to assess a bank's or financial institution's lending activities and liquidity position (Ragavan, 2016). It measures the proportion of a bank's total loan portfolio relative to its total deposits. The ratio indicates how much of the funds deposited by customers are being used to extend loans to borrowers calculated as follows:

$$\text{Total Cash to Deposit ratio} = \frac{\text{Total Cash}}{\text{Total Deposits}}$$

### **3.4.3 Moderating Variable**

Prior literature defines board independence as the proportion of outside and non-executive directors on the board (Randøy & Jenssen, 2004). Therefore, this study measured board independence as the ratio of nonexecutive directors to total number of board members (Chen, 2014).

### **3.4.4 Control Variables**

Despite the above independent variables, the researchers such as Manna et al. (2016) Mishra and Kapil (2017), Mishra (2020) and Agrawal and Lakshmi (2020) included some control variables in their studies. These control variables are firm size, firm age. The first one, namely firm size, is gauged via the natural logarithm of the book value of total assets. Large firm size may affect the performance of the companies due to more official involvement and lesser growth opportunities. Following prior studies, firm size is defined as the natural log of the total firm's assets (Lee, Upneja, Özdemir, & Sun, 2014; Rashidah & Ali, 2006). The study measured firm size as natural logarithm of Total assets.

The second one, firm age, is quantified as the current year's log minus the incorporation year. Older firms have more expertise and learnings, so they enjoy economies of scale. New firms have to build their image in the market and bear huge costs, whereas the older firms have already reached the end stage of the product life cycle. The age of the firm is the number of years the entity has survived since its incorporation. Based on extant literature, this study measured firm age as the period of time in years the firm has served since incorporation.



**Table 3.1: Measurement of Variables**

Type of Variable	Measures	Operationalization	Scale	Source
<b>Dependent Variable</b>				
Financial Performance	ROA	<i>Net Income/Total Assets</i>	Ratio	(Kurniawan, 2021).
<b>Independent Variables</b>				
Cash to Total Deposit	Liquidity management risk	$\frac{\text{cash}}{\text{Total Deposit}}$	Ratio	(Sánchez & Yurdagul, 2013).
Deposit to Total Assets	Liquidity management risk	$\frac{\text{Deposit}}{\text{Total Assets}}$	Ratio	(Rawan, 2019).
Loan to Deposit	Liquidity management risk	$\frac{\text{Loan}}{\text{Total Deposit}}$	Ratio	(Ragavan, 2016).
<b>Moderating Variable</b>				
Board Independence	No. of independent Directors in the board	the proportion of outside and non-executive directors on the board	Ratio	(Adams & Jiang, 2020; Jeanjean & Stolowy, 2009)
<b>Control Variable</b>				
Firm Size	the natural log of the total firm's assets	the natural log of the total firm's assets	Ratio	(Lee et al., 2014; Rashidah & Ali, 2006)
Firm Age	number of years the entity has survived since its incorporation	current year's log minus the incorporation year	Ratio	(Ghafoor, Zainudin, & Mahdzan, 2019)

**Source: Researcher (2023)**

### **3.5 Data Analysis and Presentation**

The collected data were subjected to a number of data analysis techniques using STATA version 16 software. In the light of the objectives of this study a hierarchical model was used.

### **3.6 Diagnostic Tests and Assumption of Multiple Linear Regression**

#### **3.6.1 Normality Test**

Tests for Normality of any study data are crucial for identifying whether or not the gathered data can be appropriately modeled by a normal distribution (Moore & McCabe, 2014). Shapiro-Wilk test is the most typical numerical tests for normality. For moderately high sample sizes ranging from 50 to 2000 items, the second test was the most suitable option. If the significance level of the Shapiro-Wilk test was more than 0.05, then the data set is considered normal. In contrast, if the significant value was less than 0.05 (0.05), the data set was considered to be significantly out of normal distribution (Razali et al., 2011).

#### **3.6.2 Heteroscedasticity tests**

The Breusch-Pagan test for heteroscedasticity was used to examine the presence of heteroscedasticity. The Stata statistical program included Breusch-Pagan commands, which were implemented. According to Obabire (2021), the Breusch-Pagan test evaluates the null and alternative hypotheses. An alternative hypothesis asserts that the error variances are a multiplicative function of one or more variables, whereas the null hypothesis asserts that the error variances are homoscedastic (equal). If the test's p-value is less than 0.05, the null hypothesis is rejected, and heteroscedasticity is present.

### **3.6.3 Stationarity Tests**

The fundamental assumption behind a regression problem is that the data are steady. Stationary means that the variables under consideration in a regression problem are constant over time (Nazlioglu, & Karul 2017). In circumstances where this assumption is violated, spurious regression relationships and the validity of the t-test and F-tests result. Stationary infers that the mean, standard deviation, and autocovariance are not changing over time. The study employed the Levin-Lin-Chu unit-root test, the Harris-Tzavalis unit-root test and the Breitung unit root test. In testing this assumption, a criterion to reject the null hypothesis holds if the test statistic returns a value of  $p = \chi$  less than or equal to 0.05.

### **3.6.4. Multicollinearity tests**

Multicollinearity, as defined by Gujarati (2003), is the existence of a perfect or exact linear relationship between some or all explanatory variables of a regression model. It occurs when one or more of the independent variables are highly correlated, leading to a number of difficulties in comprehending the importance of the individual predictor variables in the regression model. The study quantified the severity of multicollinearity in OLS analysis using the correlation matrix of explanatory variables, where the correlation coefficient between two independent variables must be less than 0.8, and variance inflation factor (VIF). As a rule of thumb, the VIF of a variable must not exceed 10 in order to conclude that multicollinearity has no effect on the regression outputs. In the event that multicollinearity is present, highly correlated predictors are dropped or the measurement changed.

### **3.6.5 Serial Autocorrelation**

If residuals are correlated when a variable is regressed on one or more variables, the regression has serial correlation. The estimated regression coefficients may be linear, unbiased, consistent, and asymptotically normally distributed in the presence of serial correlation, but they are not efficient. In other words, they lack a minimum variance.

This study utilized the Wooldridge test for autocorrelation to determine the presence of autocorrelation. Typically, when serial correlation is detected, the lag order can be adjusted so that the final latency accounts for all the serial correlation in residuals with the smallest variance.

### **3.6.6 Panel data estimation technique**

OLS with pooled cross-sectional and time-series specification assumes that all firms exhibit identical behavior in relation to the explanatory variables. In other words, it is assumed that the slope and intercept of the companies are constant over time and individuals. However, the OLS data structure is flawed for two reasons: 1) although the pooled model produces consistent estimates of the regression coefficients, the standard errors were understated and the significance level was overstated. 2) When panel data are utilized, the OLS method produces less accurate estimates of the regression coefficients than the GLS method (Johnston and Di Nardo, 1997).

The GLS method for panel data analysis frequently employs two assessment techniques: the fixed effects model and the random effects model. According to Wagner (2005), the distinction between the fixed effects model and the random effects model is whether time-invariant effects are associated with the explanatory variables. If time-invariant in the regression model correlates with independent variables, it is the fixed effects model, and if it does not correlate, it is the random effects model.

The hypothesis usually considered in the Hausman test is:

$H_0$ : Random-effects model is appropriate

$H_1$ : Fixed effects model is appropriate

A test of significance indicates that the null hypothesis is rejected indicating that the fixed effects can be considered to be appropriate.

### 3.7 Model Specification

Hierarchical multiple regression model was adopted in this study to estimate the relationships between the moderating board independence and financial performance.

The models are stated as follows:

The model specification for the control variable is as shown in model 1:

**Model 1.** Testing the effect of control variables on the financial performance.

$$FP = \beta_0 + \beta_1 FA_{it} + \beta_2 FS_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Where:

Y: Financial Performance

CTA<sub>1</sub>: Cash to Total Assets

DTA<sub>2</sub>: Deposits to Total Assets

LTD<sub>3</sub>: Loan to Total Deposits

FA: Firm age

FS: Firm size

$\beta_0$ : Constant

$\beta_1 - \beta_4$ : Regression coefficients

e: Error term

**Model 2.** Testing the effect of independent variable on financial performance.

$$FP = \beta_0 + \beta_1 FA_{it} + \beta_2 FS_{it} + \beta_3 CTA_{it} + \beta_4 DTA_{it} + \beta_5 LTD_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

A moderator is a variable that adjusts the strength of a causal relationship (Chikaraishi, *et al.*, 2015). It is a variable that affects the direction or strength of the relationship between study variables (Baron & Kenny, 1986). The study will use hierarchical multiple linear regression to test for moderation effects (Baron & Kenny, 1986). First, independent variables (cash to total asset ratio, deposits to total asset ratio and loan to total deposit ratio) in the model will be regressed against the dependent variable (financial performance) for potential direct effects. Secondly, moderating variable (board independence) will then be introduced and regressed together with other variables. Therefore, the interaction term between predictor and moderating variables will be obtained by multiplying the two variables that produced an interaction effect done at different stages for each individual interaction as specified in the hierarchical regression models below:

The model specification is as follows:

**Model 3.** Testing the moderating variable of the board independence on financial performance.

$$FP = \beta_0 + \beta_1FA_{it} + \beta_2FS_{it} + \beta_3CTA_{it} + \beta_4DTA_{it} + \beta_5LTD_{it} + BI_{it} + \varepsilon_{it} \dots (3)$$

#### **First Interaction Effect**

**Model 4.** Introducing the first interaction term between cash to total assets and board independence.

$$FP = \beta_0 + \beta_1FA_{it} + \beta_2FS_{it} + \beta_3CTA_{it} + \beta_4DTA_{it} + \beta_5LTD_{it} + \beta_6BI_{it} + \beta_7CTA * BI + \varepsilon_{it} \dots (4)$$

#### **Second Interaction Effect**

**Model 5.** Introducing the second interaction term between deposits to total assets and board independence

$$FP = \beta_0 + \beta_1 FA_{it} + \beta_2 FS_{it} + \beta_3 CTA_{it} + \beta_4 DTA_{it} + \beta_5 LTD_{it} + \beta_6 BI_{it} + \beta_7 CTA * BI + \beta_8 DTA * BI + \varepsilon_{it}$$

..... (5)

### Third Interaction Effect

**Model 6.** Introducing the third interaction term between loan to deposit ratio and board independence.

$$FP = \beta_0 + \beta_1 FA_{it} + \beta_2 FS_{it} + \beta_3 CTA_{it} + \beta_4 DTA_{it} + \beta_5 LTD_{it} + \beta_6 BI_{it} + \beta_7 CTA * BI + \beta_8 DTA * BI + \beta_9 LTD * BI + \varepsilon_{it}$$

..... (6)

Where:

Y: Financial Performance

CTA<sub>1</sub>: Cash to Total Assets

DTA<sub>2</sub>: Deposits to Total Assets

LTD<sub>3</sub>: Loan to Total Deposits

X<sub>5</sub>: Board Independence (Moderator)

$\beta_0$ : Constant

$\beta_1 - \beta_4$ : Regression coefficients

e: Error term

A moderator is a variable that modifies the strength between the predictor and outcome variable (Chikaraishi et al., 2015). It's a factor that modifies the strength or direction of the correlation between other variables in the research (Baron & Kenny, 1986). The study used hierarchical multiple linear regression to test for moderation effects (Baron & Kenny, 1986). First, began by testing the effect of control variable on dependent variable by regressing. Secondly, control variables and competency training aspects were regressed against organizational performance. Thirdly, moderating variable was introduced and regressed together with other variables. Therefore, the interaction term between predictor and moderating variables was obtained by multiplying the two variables that produced an interaction effect done at different stages for each individual interaction as specified in the hierarchical regression models

### **3.8 Ethical Consideration**

The researcher was ethical throughout the study by respecting the rights of others and remaining honest. The researcher ensured objectivity by basing data presentation, analysis, and interpretation solely on the collected data. The School of Graduate Studies at Moi University evaluated the proposal for ethical approval.

After obtaining these approvals, the researcher requested permission to acquire and analyze data from the National Commission for Science, Technology, and Innovation (NARCOSTI). The study's findings were disseminated to relevant parties via conferences and publications in peer-reviewed journals. The researcher was responsible for collecting and analyzing only the data required to attain the objectives of the study.



## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND INTERPRETATION

#### 4.0 Overview

This chapter presents the results of the study. The findings are presented in five key sections; descriptive statistics, diagnostic tests, correlation analysis and hypotheses testing.

#### 4.1 Descriptive Statistics

The descriptive statistics for the research variable over the period 2013 to 2022 are presented in table 4.1 as shown below.

**Table 4.1: Descriptive Statistics Results**

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	300	.0854393	.0541897	-.0927583	.1945744
FS	300	2.132187	.0301937	2.00488	2.202584
FA	300	3.536933	.4130771	1.94591	4.110874
CDT	300	.1800776	.4488775	.0013831	3.817433
DTA	300	.6994369	.0930805	.3226366	.8931597
LTD	300	1.021957	.4087071	.0142291	2.164
BI	300	.250336	.1983092	0.000	.625

**Source: Field data 2023**

Return on Assets (ROA) is a financial metric that measures a company's profitability relative to its total assets. The average ROA for the 300 observations is approximately 0.085, which means that, on average, each shilling of assets generates around 8.5 cents in profit. The standard deviation of 0.054 suggests that there is some variation in the ROA values, indicating that the profitability of different entities differs. The minimum and maximum values of -0.0928 and 0.1946 respectively, indicate that some entities may be

experiencing losses (negative ROA) while others are performing well in terms of profitability.

Firm Size represents the size of the entities under consideration. The average Firm Size is approximately 2.13, with a low standard deviation of 0.030, suggesting that most of the entities are clustered around this average size. The values range from 2.0049 to 2.2026, indicating that the entities in the dataset have relatively similar sizes with minimal variation.

Firm Age refers to the age or tenure of the companies. The average Firm Age is approximately 3.54, with a moderate standard deviation of 0.413. This implies that the age of the entities in the dataset varies somewhat, with some being relatively young and others more established. The minimum and maximum values of 1.9459 and 4.1109 respectively, demonstrate the range of firm ages observed.

The Cash to Deposit Ratio is a financial indicator that measures the proportion of cash reserves held by the entities in relation to their deposits. The average ratio is approximately 0.180, but with a relatively high standard deviation of 0.449, suggesting a wide dispersion of cash-to-deposit ratios among the entities. The range of values between 0.0014 and 3.817 highlights significant differences in how entities manage their cash reserves relative to their deposits.

The Deposit to Total Asset Ratio is a financial metric that indicates the percentage of total assets financed by deposits. The average ratio is approximately 0.699, with a low standard deviation of 0.093, suggesting that most entities maintain a consistent proportion of deposits relative to their total assets. The values range from 0.3226 to 0.8932, showing the diversity in the financing structure of the entities.

The Loan to Deposit Ratio is a financial indicator that measures the proportion of loans extended by the entities in relation to their deposits. The average ratio is around 1.022, with a standard deviation of 0.409, indicating some variability in loan-to-deposit ratios among the entities. The minimum and maximum values of 0.0142 and 2.164 respectively, demonstrate the range of borrowing activities relative to deposits across the observations.

Board Independence represents the level of independence of a company's board of directors. The mean of independence level is approximately 0.250, with a moderate standard deviation of 0.198. The values range from 0 to 0.625, indicating that some companies have a more independent board, while others have a lower level of independence.

## **4.2 Robustness Checks**

### **4.2.1 Unit Root Test**

Econometric models produce non-sensible or spurious regression results if data is non-stationary (Gujarati, 2012). Non-stationary data refers to a data series that does not have a constant mean, variance, and auto-covariance at various lags over time (Hossain & Hossain, 2015). Though recent, it is increasingly becoming essential to check stationarity in panel data (Maddala & Wu, 1999). Testing for stationarity means that the mean and variance of variables are time-invariant. In economics and finance, time related or seasonal shocks of one period may strongly influence subsequent periods. This study applied Levin- Lin Chu. The following hypotheses were considered in conducting the unit root test.

*Null hypothesis (H<sub>0</sub>): Panel data contains unit root [non-stationary].*

*The alternative hypothesis (H<sub>a</sub>): Panel data is stationary.*

**Table 4.2: Unit Root Test Results**

	Levin-Lin-Chu unit-root test		Harris-Tzavalis unit-root test		Breitung unit-root test	
	Statistic	p-value	Rho	p-value	Statistics	p-value
ROA	-16.243	0.002	-11.334	0.000	-6.123	0.000
CTA	-26.393	0.002	-15.658	0.000	-4.785	0.000
DTA	-10.078	0.000	-14.911	0.000	-6.789	0.000
LTA	-13.689	0.000	-13.594	0.000	-5.352	0.000
FS	-8.008	0.001	-6.877	0.000	-2.690	0.004
FA	-14.891	0.000	-9.496	0.000	-7.226	0.000

Source: Field data 2023

Considering the  $p$ - values shown in Table 4.2, the null hypothesis was rejected at all conventional significance levels for all the study variables; implying that there was no unit root in the panel data and that the data was suitable for statistical analysis.

#### 4.2.2 Normality Tests

To confirm normality Shapiro Wilk Normality test was used. The results presented in table 4.3 show that the  $p$ -value is greater than 0.05 value. Thus, the null hypothesis that the residuals are normally distributed cannot be rejected and the conclusion is that the data is normally distributed.

**Table 4.3: Shapiro Wilk Normality test Results**

Skewness/Kurtosis tests for Normality				----- joint -----	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
resid	300	0.8053	0.0543	3.90	.1426

Source: Field data 2023

#### 4.2.3 Multicollinearity

Multicollinearity implies that that two or more of the predictor variables are highly correlated. The study used the Variance inflation factor (VIF) and the correlation matrix

to check for the presence or absence of multicollinearity. Multicollinearity is present if the VIF value is higher than 10 (Gujarati, 2012) or the pairwise correlation coefficients are greater than 0.8. Table 4.4 indicates that the VIF values range between 1.17 and 1.45; which, are less than 10, implying the research variables do not suffer from multicollinearity.

**Table 4.4: Multicollinearity Test Results**

Variable	VIF	1/VIF
FS	1.45	0.689482
LTD	1.44	0.693419
BI	1.36	0.735591
CDT	1.35	0.741998
FA	1.34	0.744669
DTA	1.17	0.857155
Mean VIF	1.35	

**Source: Field data 2023**

#### 4.2.4 Autocorrelation Test

Wooldridge test for autocorrelation was used to check for autocorrelation. The results presented in table 4.5 show that the  $p$ -values is 2.465 > 0.05. Therefore, the test's null hypothesis that there is no first order correlation cannot be rejected.

**Table 4.5: Wooldridge test for Autocorrelation Test Results**

Wooldridge test for autocorrelation in panel data

H0: no first order autocorrelation

$$F(1, 29) = 2.465$$

$$\text{Prob} > F = 0.1273$$

**Source: Field data 2023**

#### 4.2.5 Test for Heteroskedasticity

The Breusch-Pagan/ Cook-Weisberg test were used to test for heteroskedasticity, and the results are presented in Table 4.6. The test uses a cluster-robust standard error estimator to control heteroskedasticity. Using this robust standard error estimator (cluster), the study assumed that observations should be independent across clusters. The Chi2 (1) value was *0.13* and *p-value of 0.809* revealing that the null hypothesis was not rejected. Thus, the assumption of homoscedasticity was not violated.

**Table 4.6: Breusch-Pagan / Cook-Weisberg Test for Heteroscedasticity Test Results**  
**Variables: Myresiduals**

---

chi2(1) =	0.13
Prob > chi2 =	0.809

---

**Source: Field data 2023**

#### 4.2.6 Specification Error Test

Table 4.7 highlights the results of the Ramsey RESET test. From the findings in the table, the probability values of the computed statistics in the Ramsey RESET test are more than the threshold value of 0.05; implying the model does not seem to be misspecified.

**Table 4.7: Ramsey RESET (test using powers of the fitted values of (ROA) Test Results**

---

Ho: model has no omitted Variables
F(3, 293) =0.35
Prob > F = 0.7916

---

**Source: Field data 2023**

### 4.2.7 Correlation Analysis

The objective of correlation analysis is to comprehend the character and extent of the relationship between research variables. Table 4.8 displays the pairwise correlation coefficients for the variables of the study. Pearson pairwise correlation results in the table show that the relationship between cash to deposit ratio ( $r= 0.4569$ ;  $\rho < 0.05$ ), loan to total deposit ratio ( $r= 0.4022$ ;  $\rho < 0.05$ ), firm size ( $r= 0.3956$ ;  $\rho < 0.05$ ) and return on assets is positive and statistically significant. The association between firm age ( $r= -0.1887$ ;  $\rho < 0.05$ ) and return on assets is negative and statistically significant.

**Table 4.8: Correlation results**

	ROA	CDT	DTA	LTD	BI	FA	FS
ROA	1.0000						
CDT	0.4569*	1.0000					
DTA	0.1035	0.1004	1.0000				
LTD	0.4022*	0.3937*	-0.1439*	1.0000			
BI	0.4970*	0.2331*	0.0069	0.3222*	1.0000		
FA	-0.1887*	-0.0388	0.2877*	-0.3035*	-0.0710	1.0000	
FS	0.3956*	0.2369*	0.0323	0.1506*	0.4175*	0.2279*	1.0000

- Means significant at 5 percent level of significance

**Source: Field data 2023**

### 4.3 Regression Analyses

Several regression analysis were done since the study was testing the moderating effect of board independence on the relationship between liquidity management risks and financial performance of Tier-1 Savings and Credit Cooperatives (SACCOs) in Kenya. The first model tested for the effect of the control variables on the outcome variable. The second model was used to determine the effect of the predictor variables on the outcome variable. The third model tested for the effect of the moderating variable on the dependent variable.

### 4.3.1 The Effect of the Control Variables on financial performance of Tier-1 SACCOs

The regression results for financial performance of Tier-1 Savings and Credit Cooperatives (SACCOs) and the control variables are presented in table 4.9. Based on the results of the Hausman Test, the random effect model is used for interpretations.

**Table 4.9: Control Variable Regression Results**

Random-effects GLS regression	Number of obs	=	300			
Group variable: ID	Number of groups	=	30			
R-sq: within = 0.1722	Obs per group: min	=	10			
between = 0.2938	avg	=	10.0			
overall = 0.2278	max	=	10			
	Wald chi2(2)	=	66.97			
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000			
ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FS	.8094118	.1011164	8.00	0.000	.6112273	1.007596
FA	-.0531378	.0127672	-4.16	0.000	-.0781611	-.0281145
_cons	-1.452176	.2058168	-7.06	0.000	-1.855569	-1.048782
sigma_u	.0294898					
sigma_e	.03666912					
Rho	.39274673					(fraction of variance due to u_i)

**Source: Field data 2023**

Firm size has a significant and positive effect on financial performance of Tier-1 Savings and Credit Cooperatives (SACCOs) ( $\beta = 0.8094$ ,  $\rho < 0.05$ ), and the results agrees with those done by Lukhanda, Kalunda & Achoki, (2019). Economies of scale explain the significant and positive effect of Firm Size on the financial performance of Tier-1 SACCOs (Tipis, 2022). Large SACCOs typically enjoy economies of scale. As they expand, their fixed costs can be distributed across a larger base of operations, resulting in reduced average unit costs. This efficacy can result in increased profits and enhanced



financial performance. In addition, larger SACCOs may have greater bargaining power with their suppliers, enabling them to negotiate better terms and lower prices. In addition, larger SACCOs are able to provide a broader selection of financial products and services (Piprek, 2007). By diversifying their offerings, they can attract a wider variety of customers and meet the diverse financial requirements of their members. This improved portfolio of services may result in increased revenue streams and enhanced financial performance. Due to their stronger financial position and reputation, larger SACCOs may find it simpler to access external capital and resources, such as loans and investments (Ondieki *et al.*, 2017). With increased access to capital, they are able to make strategic investments, expand operations, and initiate new initiatives, all of which contribute to a rise in profitability.

Firm age has a significant and negative effect on financial performance of Tier-1 Savings and Credit Cooperatives (SACCOs) ( $\beta = -.05313$ ,  $\rho < 0.05$ ), and the results agrees with those done by (Ademba, 2019). Older SACCOs may be unable to adapt to swiftly changing market conditions and technological advancements, which may have a significant and negative impact (Okelo, 2014). Younger SACCOs may be more innovative, able to implement cutting-edge technologies and responsive to changing customer demands. As a result, younger SACCOs can grasp growth opportunities, recruit new members, and provide innovative products and services, which contribute to improved financial performance. Moreover, elder SACCOs may have more rigid organizational structures and established cultures, which may hinder their adaptability and responsiveness to market changes. On the other hand, younger SACCOs may have a more flexible and dynamic structure, allowing them to rapidly adjust their strategies in response to market demands, which could have a positive effect on their financial performance (Gitau, 2011). Lastly, older SACCOs may rely primarily on traditional

financial products that may not appeal to customers' shifting preferences. Younger SACCOs, on the other hand, may prioritize the creation of novel, more alluring financial products that are tailored to the requirements of their target market. A diversified and innovative product portfolio can result in increased member engagement and enhanced financial performance.

#### **4.3.2 The Effect of the Liquidity management risks on financial performance of Tier-1 SACCOs**

The regression results for liquidity management on financial performance of Tier-1 Saccos are presented in table 4.10. The Hausman Test supported the use of the random effect model to test the direct hypotheses. The overall R<sup>2</sup> of model shows that the control variables and the independent variables explain 38.23 % variation financial performance of Tier-1 Saccos over the study period. Additionally the Wald chi<sup>2</sup> (6) 197.40 Prob > chi<sup>2</sup> =0.0000 confirms the validity of the model. In general, coefficients of the cash to deposit ratio, deposit to total asset ratio and loan to deposit ratio are positive measures of liquidity management risks; implying that a high score indicates high financial performance and vice versa (Lipson & Mortal, 2009). Hence, the positive coefficients indicate a positive relationship between liquidity management risks and financial performance of Saccos and vice versa.

**Table 4.10: Direct Effect Results**

Random-effects GLS regression	Number of obs =	300				
Group variable: ID	Number of groups =	30				
R-sq: within = 0.4064	Obs per group: min =	10				
between = 0.3587	avg =	10.0				
overall = 0.3823	max =	10				
	Wald chi2(5) =	197.40				
corr(u_i, X) = 0 (assumed)	Prob > chi2 =	0.0000				
ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
FS	.4992985	.0933837	5.35	0.000	.3162698	.6823272
FA	-.0441306	.0120776	-3.65	0.000	-.0678022	-.020459
CDT	.1537982	.0306795	5.01	0.000	.0936675	.2139289
DTA	.1464457	.0293016	5.00	0.000	.0890156	.2038759
LTD	.0319026	.0074505	4.28	0.000	.0172999	.0465053
_cons	-1.048089	.1830446	-5.73	0.000	-1.40685	-.6893286
sigma_u	.02872308					
sigma_e	.03130846					
Rho	.45701265	(fraction of variance due to u_i)				

**Source: Field data 2023**

The results of the random effect regression presented in Table 4.10 were used to test the four direct hypotheses as discussed below.

**Hypothesis (H<sub>01</sub>)** stated that: *Cash to deposit ratio has no significant effect on financial performance of Tier-1 Saccos.* The results presented in Table 4.10 show that cash to deposit ratio has a significant positive effect on financial performance of tier-1 Saccos ( $\beta_1 = 0.1466$  and  $p\text{-value} < 0.05$ ); hence, (H<sub>01</sub>) was rejected. Further, a unit increase in cash to deposit ratio leads to a 0.1466 unit increase in financial performance of tier-1 Saccos. Wangu, (2021) found out that liquidity management risks impact financial performance. The cash to deposit ratio is a crucial indicator of the financial health and performance (Philip & Prasad, 2023). A significant positive effect on the financial performance of these Saccos can be attributed to maintaining a high cash to deposit ratio.

Firstly, a high cash to deposit ratio indicates that the Sacco holds a substantial portion of its funds in cash or highly liquid assets. This liquidity provides the Sacco with a robust financial buffer, enabling it to meet its short-term financial obligations, such as member withdrawals or loan disbursements. By having adequate cash reserves, the Sacco can avoid liquidity crises and minimize the need for emergency borrowing, thereby reducing interest expenses and potential defaults. Secondly, a high cash to deposit ratio is a reflection of the Sacco's efficient management of its funds. It indicates that the organization is successful in managing its cash inflows and outflows, optimizing cash utilization, and maintaining an appropriate balance between its assets and liabilities. Such prudent cash management leads to reduced operational risks and allows the Sacco to invest in growth opportunities or distribute surplus funds among its members, ultimately enhancing its financial performance. Furthermore, a high cash to deposit ratio can also positively influence the Sacco's creditworthiness and reputation among investors and depositors. A strong liquidity position signals stability and reliability, attracting more members and encouraging existing ones to entrust their savings with the Sacco. As deposits increase, the Sacco gains access to more funds, which can be channeled into profitable investments or used to expand its service offerings. This cycle of increased deposits leading to more opportunities for growth reinforces the Sacco's financial performance

**Hypothesis (H<sub>02</sub>)** stated that: *Deposits to total assets ratio has no significant effect on financial performance of Tier-1 Saccos.* The results indicate a significantly positive association between deposit to total assets ratio and financial performance of tier-1 Saccos ( $\beta_2 = 0.1405$ ,  $\rho < 0.05$ ); therefore, H<sub>02</sub> is rejected. Based on the regression results a unit increase in deposit to total assets ratio increases financial performance of tier-1 Saccos by 0.1405 units. A high deposit to total assets ratio denotes high liquidity and

therefore high liquidity management risks. Higher deposit to total assets ratio indicates that the Sacco relies more on member deposits, which are generally a stable and low-cost source of funding (Ademba, 2019). By depending less on external borrowings and expensive funding options, the Sacco can reduce its interest expenses, leading to improved profitability and net interest margin (Kirimi, Simiyu & Murithi, 2017). Moreover, a healthy deposit to total assets ratio enhances the Sacco's lending capacity. With a larger pool of member deposits, the Sacco has more funds available for lending to creditworthy members. This increased lending capacity allows the Sacco to generate higher interest income from loans, contributing to overall revenue growth and financial stability.

Additionally, maintaining a strong deposit to total assets ratio fosters a sense of trust and confidence among members (Kinyua, 2016). When members perceive the Sacco as financially stable and secure, they are more likely to continue depositing their savings and availing themselves of the organization's services. This increased member loyalty leads to higher retention rates and attracts new members, ultimately bolstering the Sacco's financial position. Moreover, regulatory compliance plays a role in this positive association. Regulators often mandate Saccos to maintain a minimum deposit to total assets ratio to ensure financial soundness and protect members' interests (Munene & Makori, 2013). By adhering to these regulatory requirements, the Sacco demonstrates its commitment to financial prudence, which can enhance its reputation and credibility in the market, attracting more members and business opportunities. Lastly, a higher deposit to total assets ratio reflects effective financial management and risk mitigation strategies (Wanjiru & Jagongo, 2022). Saccos that prioritize building and maintaining a solid deposit base are better equipped to weather economic downturns or unforeseen

challenges. The ability to manage risks and maintain liquidity enhances the Sacco's resilience, contributing to its long-term financial performance.

**Hypothesis (H<sub>03</sub>)** stated that; *Loan to deposit ratio has no significant effect on financial performance of Tier-1 Saccos*. The regression results in Table 4.10 illustrate that loan to deposits ratio has a significant positive effect on financial performance of tier-1 Saccos ( $\beta_3 = 0.0238$  and  $p < 0.05$ ); thus H<sub>03</sub> was rejected. The loan to deposits ratio plays a crucial role in determining the financial performance of Tier-1 Savings and Credit Cooperative Organizations (Saccos). A significant positive effect on financial performance can be observed when the Sacco maintains an optimal loan to deposits ratio. To begin with, a healthy loan to deposits ratio indicates that the Sacco efficiently utilizes its member deposits by extending loans to creditworthy borrowers (Muriuki, 2022). By lending out a substantial portion of the deposits received, the Sacco can generate interest income, which serves as a primary revenue stream. This interest income contributes to the Sacco's overall profitability and financial sustainability. Additionally, an appropriate loan to deposits ratio reflects the Sacco's ability to balance risk and liquidity (Otwoko & Maina, 2021). By maintaining a balanced ratio, the Sacco ensures that it has enough liquid funds (from deposits) to meet potential member withdrawals and other short-term obligations while also having enough loan assets to generate interest income. This balance enhances the Sacco's resilience to financial shocks and economic fluctuations, mitigating the risk of liquidity crises. Moreover a higher loan to deposits ratio implies that the Sacco is meeting the financial needs of its members effectively (Birgen, Njau & Magadi, 2023). When members can access loans from the Sacco, they are more likely to remain engaged and loyal to the organization. Satisfied members are more inclined to continue depositing their savings with the Sacco, which increases the deposit base and strengthens the institution's financial position. Moreover, a positive association between

the loan to deposits ratio and financial performance is often linked to prudent credit risk management. Maintaining a well-diversified and carefully assessed loan portfolio reduces the risk of defaults and non-performing loans. A lower level of credit risk translates to lower provisions for loan losses and improved overall asset quality, positively impacting the Sacco's profitability and capital adequacy. Lastly, an optimal loan to deposits ratio can lead to economies of scale. By efficiently managing its loan portfolio, the Sacco can lower transaction costs and administrative expenses, improving operational efficiency. As a result, the Sacco can allocate resources more effectively, invest in technology, and expand its service offerings, contributing to enhanced financial performance and member satisfaction.

#### **4.3.3 Testing the Effect of board independence on financial performance of Tier-1 Saccos**

The study's main objective was to examine the effect of board independence on financial performance of tier-1 Saccos. To achieve this, the study regressed the outcome variable against the moderating variable while controlling for the independent variables. The regression results are presented in table 4.10 as shown below. The regression results for board independence on financial performance of Tier-1 Saccos are presented in table 4.10. The Hausman Test supported the use of the random effect model to test the direct hypotheses. The overall  $R^2$  of model shows that the control variables, liquidity management risks and independent variables explain 44.92 % variation financial performance of Tier-1 Saccos over the study period. Additionally the Wald  $\chi^2$  (6) 232.26 Prob >  $\chi^2$  =0.0000 confirms the validity of the model. In general, coefficients board independence is positive measures of financial performance.

**Table 4.11: Random Effect Regression Results**

Random-effects GLS regression	Number of obs	=	300			
Group variable: ID	Number of groups	=	30			
R-sq: within = 0.4423	Obs per group: min	=	10			
between = 0.4702	avg	=	10.0			
overall = 0.4492	max	=	10			
	Wald chi2(6)	=	232.26			
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000			
ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FS	.4163141	.0920472	4.52	0.000	.2359049	.5967234
FA	-.0414662	.0116144	-3.57	0.000	-.0642301	-.0187023
CDT	.1465944	.0297266	4.93	0.000	.0883313	.2048574
DTA	.1405332	.0283576	4.96	0.000	.0849533	.1961131
LTD	.0238218	.0074106	3.21	0.001	.0092973	.0383463
BI	.0822246	.0178101	4.62	0.000	.0473175	.1171316
_cons	-.8844997	.1806041	-4.90	0.000	-1.238477	-.5305222
sigma_u	.02748271					
sigma_e	.03038955					
Rho	.44989791 (fraction of variance due to u_i)					

**Source: Field data 2023**



#### 4.3.4 Testing the moderating effect of board independence on the relationship between liquidity management risks and financial performance of Tier-1 Saccos

**Table 4.12: board independence on financial performance Regression Results**

Random-effects GLS regression	Number of obs	=	300			
Group variable: ID	Number of groups	=	30			
R-sq: within = 0.4974	Obs per group: min	=	10			
between = 0.4896	avg	=	10.0			
overall = 0.4837	max	=	10			
	Wald chi2(9)	=	281.92			
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000			
ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FS	.4034719	.0884462	4.56	0.000	.2301204	.5768233
FA	-.0396416	.0115008	-3.45	0.001	-.0621827	-.0171005
CDT	.1027852	.0317603	3.24	0.001	.0405362	.1650343
DTA	.0776554	.0297716	2.61	0.009	.0193042	.1360066
LTD	.01749	.0072216	2.42	0.015	.003336	.0316439
BI	.083887	.0183147	4.58	0.000	.0479909	.119783
BI*CDT	-.1967645	.0997162	-1.97	0.048	-.3922047	-.0013244
BI*DTA	-.3306325	.0777014	-4.26	0.000	-.4829243	-.1783406
BI*LTD	-.1107923	.0328139	-3.38	0.001	-.1751064	-.0464781
_cons	-.7873085	.1741512	-4.52	0.000	-1.128639	-.4459784
sigma_u	.02786434					
sigma_e	.02893547					
Rho	.48114886	(fraction of variance due to u_i)				

Source: Field data 2023

**Hypothesis (H4<sub>a</sub>)** stated that; *Board independence does not significantly moderate the relationship between cash to deposit ratio and financial performance of tier-1 Saccos.*

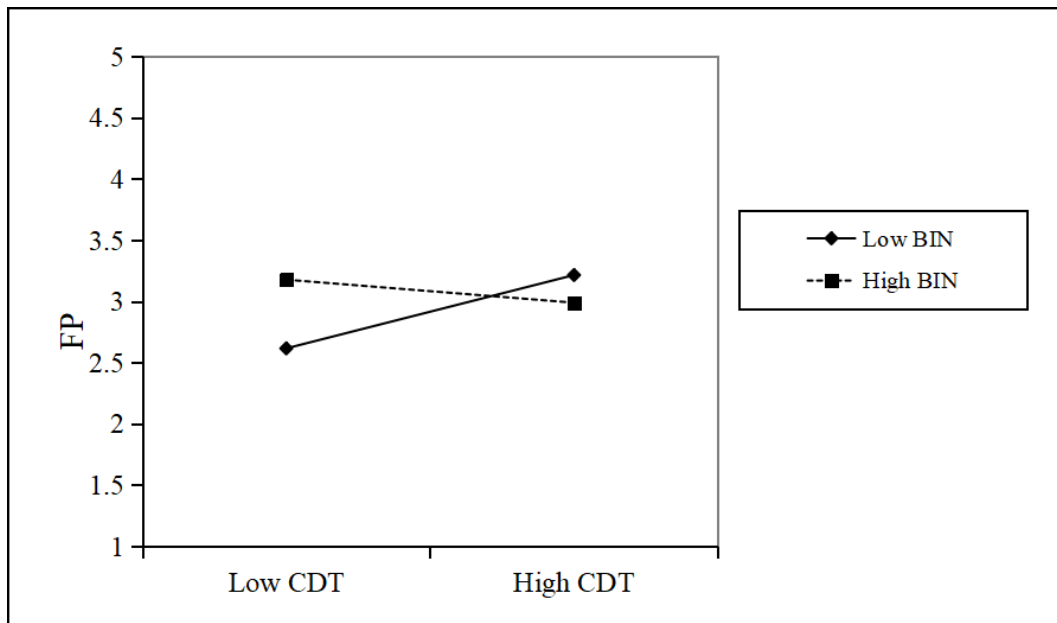
The regression results show that board independence negatively moderate the relationship between cash to deposit ratio and financial performance of tier-1 Saccos ( $\beta = -0.1968$  and  $\rho < 0.05$ ); hence hypothesis H0<sub>4a</sub> was rejected. The negative moderation effect of board independence on the relationship between the cash to deposit ratio and the financial performance of Tier-1 Savings and Credit Cooperative Organizations (SACCOs) can be attributed to several reasons. Firstly, a high level of board

independence might lead to a more cautious approach to financial decision-making (Firnanti & Karmudiandri, 2020). An independent board, focused on risk mitigation and governance, could emphasize maintaining a substantial cash to deposit ratio as a protective measure against potential uncertainties, limiting the funds available for investment in profit-generating opportunities.

Secondly, an independent board might exhibit greater scrutiny and risk aversion due to its fiduciary responsibilities (Shaikh, Drira & Hassine, 2019). In this context, the board might prioritize liquidity management as a safeguard against potential financial distress, which can inadvertently restrict the SACCO's ability to channel funds into more profitable ventures that would enhance its financial performance. Moreover, a high cash to deposit ratio might signal to an independent board that there are concerns about liquidity mismatches or member withdrawals. This perception could drive the board to focus on maintaining ample liquidity, even if it means sacrificing short-term returns on investment. Consequently, the negative moderation effect emerges as board independence amplifies the emphasis on risk avoidance and the prioritization of liquidity over aggressive investment strategies.

Lastly, an independent board might place greater emphasis on aligning with the conservative expectations of members, regulators, and stakeholders. This alignment could lead to a conservative cash management strategy, which, while safeguarding the SACCO's reputation and minimizing risk, might hinder its potential to achieve higher financial performance through more proactive allocation of resources (Ngeno, 2019).

Figure 4.1 below shows that financial performance is high with low cash to deposit ratio and high board independence.

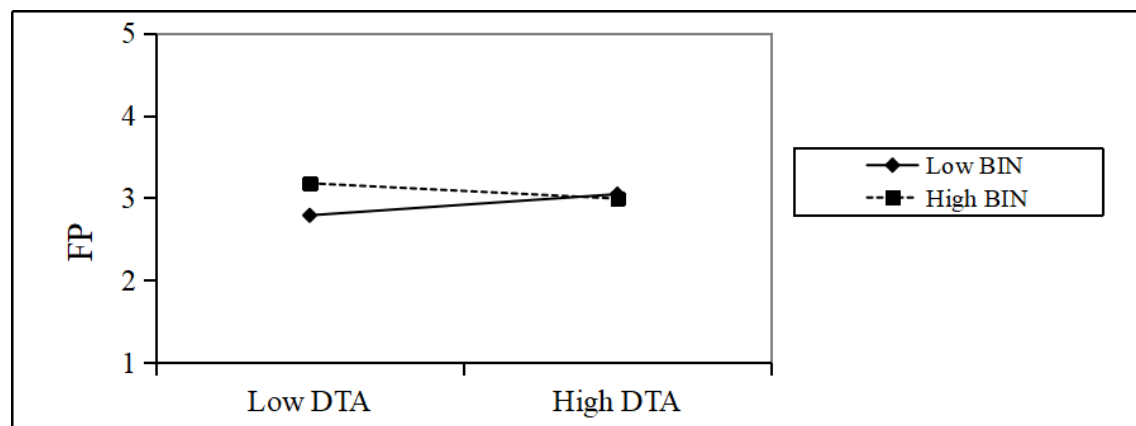


**Figure 4.1: Modgraph on Board independence on Cash deposit ratio and ROA**

**Hypothesis (H4<sub>b</sub>)** stated that; *Board independence does not significantly moderate the relationship between deposit to total assets ratio and financial performance of tier-1 Saccos*. The regression results show that board independence significantly moderate the relationship between deposit to total assets ratio and financial performance of tier-1 Saccos ( $\beta = -0.3306$  and  $\rho < 0.05$ ); hence hypothesis H04<sub>b</sub> was rejected. The negative moderation effect of board independence on the relationship between the deposit to total assets ratio and the financial performance of Tier-1 Savings and Credit Cooperative Organizations (SACCOs) can be attributed to several underlying factors. Firstly, a high level of board independence often correlates with a heightened emphasis on risk management and prudential governance (Nawaz, Hussain & Khan, 2023). In this context, an independent board might prioritize maintaining a higher deposit to total assets ratio as a means to enhance liquidity and ensure the SACCO's ability to meet member demands, even during uncertain times. While this approach provides stability, it could limit the SACCO's capacity to invest in higher-yield assets that contribute to improved financial performance.

Secondly, an independent board might adopt a more cautious approach to investments, particularly in assets with higher returns but also higher risks. The prioritization of preserving the SACCO's reputation and protecting member interests could lead to an inclination towards less risky, yet lower yielding, investment options, adversely affecting overall financial performance (Juma & Maseko, 2022). Furthermore, an independent board's fiduciary responsibilities might lead to a preference for conservative financial practices, including maintaining a higher proportion of deposits to total assets. While this approach safeguards the SACCO's financial stability, it may constrain its ability to optimize profitability through strategic asset allocation and capital deployment.

Figure 4.2 below shows that financial performance is high with low deposit to total asset ratio and high board independence.



**Figure 4.2: Modgraph on Board independence on deposit to total assets ratio and ROA**

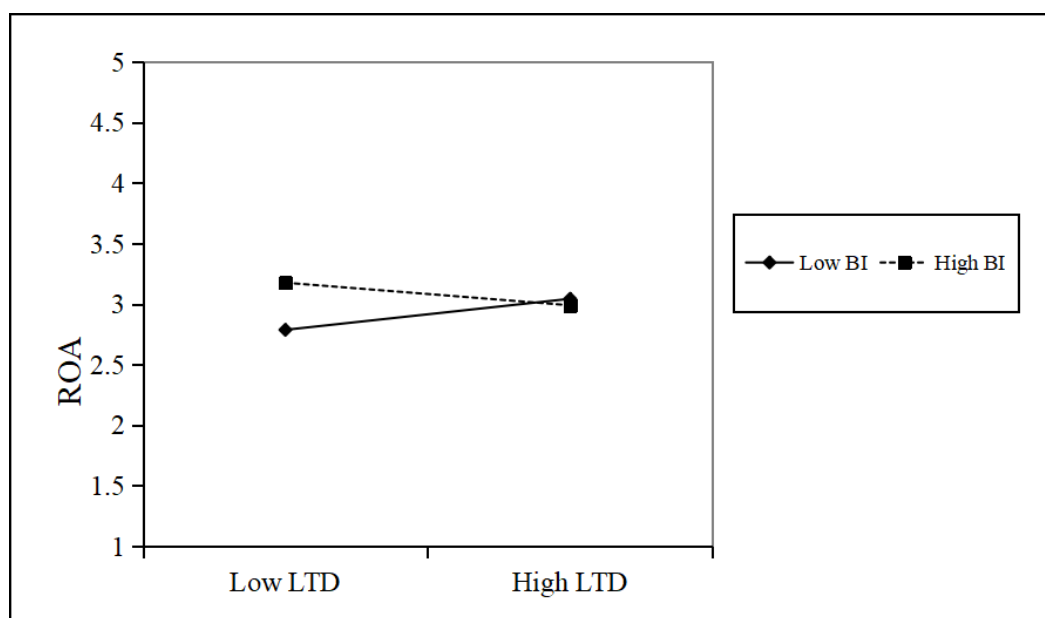
**Hypothesis (H4<sub>c</sub>)** stated that; *Board independence does not significantly moderate the relationship between loan to deposit ratio and financial performance of tier-1 Saccos.*

The regression results show that board independence significantly moderate the relationship between loan to deposit ratio and financial performance of tier-1 Saccos ( $\beta = -0.1108$  and  $\rho < 0.05$ ); hence hypothesis H04<sub>c</sub> was rejected. The negative moderation effect of board independence on the relationship between the loan to deposit ratio and the

financial performance of Tier-1 Savings and Credit Cooperative Organizations (SACCOs) can be attributed to several underlying factors. Firstly, a high level of board independence often corresponds to a more cautious and risk-averse approach to financial decision-making. An independent board, focused on prudent governance and safeguarding member interests, might prioritize minimizing loan-related risks by constraining the loan to deposit ratio, potentially hindering the SACCO's ability to extend credit and generate higher interest income (Nteere, 2022).

Secondly, an independent board may exhibit heightened concern about the potential consequences of excessive loan exposure (Black *et al.*, 2020). Focused on the SACCO's stability and reputation, the board might be inclined to maintain a lower loan to deposit ratio to mitigate the risk of default and potential member dissatisfaction, even if this cautious approach limits the SACCO's potential to achieve greater financial performance through increased lending activities. Furthermore, an independent board's fiduciary responsibilities could lead to a preference for a conservative stance, with an emphasis on protecting member deposits and minimizing exposure to lending risks. This inclination might discourage the SACCO from adopting a higher loan to deposit ratio, even if such a strategy could lead to increased interest income and improved financial performance.

Figure 4.3 below shows that financial performance is high with high low deposit to total assets ratio and high board independence.



**Figure 4.3: Modgraph on Board independence on loan to total deposits ratio and ROA**

**Table 4.131: Summary Results of Hypotheses Tests**

Hypotheses	$\beta$	P<5%	Decision
<b>H<sub>01</sub></b> : cash to deposit ratio has no significant effect on financial performance	0.1466	0.000	Rejected
<b>H<sub>02</sub></b> : deposit to total asset ratio has no significant effect on financial performance	0.1405	0.000	Rejected
<b>H<sub>03</sub></b> : loan to deposit ratio has no significant effect on financial performance	0.0238	0.001	Rejected
<b>H<sub>04a</sub></b> : Board independence does not significantly moderate the relationship between cash to deposit ratio and financial performance	-0.1968	0.048	Rejected
<b>H<sub>04b</sub></b> : Board independence does not significantly moderate the relationship between deposit to total assets ratio and financial performance	-0.3306	0.000	Rejected
<b>H<sub>04c</sub></b> : Board independence does not significantly moderate the relationship between loan to deposit ratio and financial performance	-0.1108	0.001	Rejected

**Source: Field data 2023**

**Table 4.14: Summary Table for Moderation**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
	<b>Coef.</b>	<b>Coef.</b>	<b>Coef.</b>	<b>Coef.</b>	<b>Coef.</b>	<b>Coef.</b>
	<b>(Std. Err.)</b>	<b>(Std. Err.)</b>	<b>(Std. Err.)</b>	<b>(Std. Err.)</b>	<b>(Std. Err.)</b>	<b>(Std. Err.)</b>
_cons	-1.4522 (0.2058)**	-1.048(0.1830)**	-0.8845(0.1806)**	-0.8591(0.181)**	-0.8158(0.177)**	-0.7873(0.174)**
FS	0.8094 (0.1011)**	.4993(0.0933)**	0.4163(0.0920)**	0.4156(0.092)**	0.4068(0.090)**	0.40349(0.088)**
FA	-0.0531(0.046)**	-.04413(0.0120)**	-0.04147(0.0116)**	-0.0423(0.012)**	-0.0407(0.0114)**	-0.0397(0.012)**
CDT		-.1537982 (0.0307)**	0.1466(0.0297)**	.1240(0.032)**	0.1211(0.032)**	.1028(0.032)**
DTA		.1464457 (0.0293)**	0.1405(0.0283)**	.1320(0.029)**	0.0973(0.030)**	0.0777(0.030)**
LTD		.0319026 (0.0074)**	0.0238(0.0074)**	.0229(0.007)**	0.0195(0.007)**	0.0175(0.007)**
BI			0.0822(0.01781)**	.0792(0.018)**	0.0670(0.018)**	0.0839(0.018)**
CDT*BI				-0.1713(0.104)**	-0.1797(0.102)**	-0.1968(0.040)**
DTA*BI					-0.2959(0.177)**	-0.3306(0.078)**
LTD*BI						-0.1108(0.033)**
R-square	0.2278	0.3823	0.4492	.4502	.4829	.4837
ΔR-squared -		.1545	0.0669	.001	0.0327	.0008
Wald chi2	66.97	197.4	562.96	236.34	261.29	281.92
Prob > chi2	.000	.000	.000	.000	.000	.000
<b>Hausman Test</b>						
chi2	5.17	6.15	5.61	8.61	7.94	9.75
Prob>chi2	0.0755	0.2919	.4686	0.2815	0.4393	0.37111

\*p<0.05, standard error (Std. Err) in parentheses

**Source: Field data 2023**

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Overview

This chapter presents a summary of the findings, conclusions, recommendations limitations and suggestions for further studies.

#### 5.1 Summary of Findings of the Study

This study sought to examine whether board independence moderates the relationship between liquidity management risks and financial performance of tier-1 Saccos. The main predictor variables were cash to deposit ratio, deposit to total assets ratio and loan to deposit ratio. The target population consisted of all tier-1 Saccos supervised by SASRA in Kenya. The study period was 2013 to 2022. The findings of the study revealed that liquidity management risks significantly affect the financial performance of tier-1 Saccos in Kenya. Besides, the study found that board independence moderates the relationship between liquidity management risks and financial performance of tier-1 Saccos in Kenya.

##### 5.1.1 Effect of cash to deposit ratio on financial performance of tier-1 Saccos

The study's first specific objective was to assess the effect of cash to deposit ratio on financial performance of tier-1 Saccos in Kenya. The findings revealed that cash to deposit ratio had a positive and significant effect on financial performance of tier-1 Saccos in Kenya ( $\beta = 0.1466$ ;  $\rho < 0.05$ ); suggesting that tier-1 Saccos with higher cash to deposit ratio are more likely to have higher financial performance. The cash-to-deposit ratio is an important indicator of a company's financial health and performance (Philip & Prasad, 2023). Maintaining a high ratio of cash to deposits has a significant positive impact on the financial performance of these Saccos. First, a high cash-to-deposit ratio indicates that the Sacco retains a significant portion of its funds in cash or highly liquid



assets. Cash liquidity provides the Sacco with a robust financial buffer, enabling it to meet its short-term financial obligations, such as member withdrawals or loan disbursements. By maintaining sufficient cash reserves, the Sacco can avoid liquidity crises and minimize the need for emergency financing, thereby reducing interest expenses and the likelihood of default. Secondly, a high cash-to-deposit ratio indicates that the Sacco is adept at managing its funds. It indicates that the organization is able to effectively manage its cash inflows and outflows, maximize cash utilization, and maintain an appropriate balance between its assets and liabilities. Such judicious cash management reduces operational risks and enables the Sacco to invest in growth opportunities or distribute surplus funds to its members, thereby improving its financial performance. Moreover, a high cash-to-deposit ratio can positively affect the Sacco's creditworthiness and reputation with investors and depositors. A robust liquidity position indicates stability and dependability, attracting new members and encouraging existing members to entrust their savings to the Sacco. As deposits increase, the Sacco obtains access to more funds, which can be used for profitable investments or to expand its service offerings.

### **5.1.2 Effect of Deposit to total assets ratio on financial performance of tier-1 Saccos**

The study's second specific objective was to assess the effect of deposit to total assets ratio on financial performance of tier-1 Saccos in Kenya. The findings revealed that deposit to total assets ratio had a positive and significant effect on financial performance of tier-1 Saccos in Kenya ( $\beta = 0.1405$ ;  $\rho < 0.05$ ); suggesting that tier-1 Saccos with higher deposit to total assets ratio are more likely to have higher financial performance. A high deposits-to-total-assets ratio indicates high liquidity and, consequently, high risks associated with managing liquidity. Higher deposit to total assets ratio indicates that the Sacco depends more on member deposits, which are typically a stable and inexpensive

source of funding (Ademba, 2019). By relying less on external borrowings and costly funding options, the Sacco can reduce its interest expenses, thereby increasing its profitability and net interest margin (Kirimi, Simiyu, & Murithi, 2017). In addition, a robust ratio of deposits to total assets improves the Sacco's lending capacity. With a larger deposit pool, the Sacco has more funds available to lend to creditworthy members. This increased lending capacity enables the Sacco to generate a greater amount of interest income from loans, thereby contributing to the growth of its overall revenue and financial stability.

In addition, sustaining a high deposit-to-total-assets ratio fosters a sense of trust and confidence among members (Kinyua, 2016). When members view the Sacco as financially stable and secure, they are more likely to continue depositing savings and utilizing the organization's services. This increased member loyalty results in higher retention rates and attracts new members, bolstering the Sacco's financial position. Regulatory compliance also plays a role in this positive relationship. Regulators frequently require Saccos to maintain a minimum deposit-to-total-assets ratio to guarantee financial soundness and protect members' interests (Munene & Makori, 2013). By adhering to these regulatory requirements, the Sacco demonstrates its commitment to financial prudence, which can enhance its market reputation and credibility, attracting more members and business opportunities. Lastly, a higher deposit-to-total-assets ratio indicates effective financial management and risk mitigation strategies (Wanjiru & Jagongo, 2022). Saccos that prioritize building and sustaining a solid deposit base are better equipped to weather economic downturns or unforeseen challenges. The ability to manage risks and maintain liquidity contributes to the Sacco's long-term financial performance by enhancing its resilience.

### **5.1.3 Effect of loan to deposit ratio on financial performance of tier-1 Saccos**

The study's third specific objective was to assess the effect of loan to deposit ratio on financial performance of tier-1 Saccos in Kenya. The findings revealed that loan to deposit ratio had a positive and significant effect on financial performance of tier-1 Saccos in Kenya ( $\beta = 0.0238$ ;  $\rho < 0.05$ ); suggesting that tier-1 Saccos with higher loan to deposit ratio are more likely to have higher financial performance. When a Sacco maintains an optimal loan-to-deposit ratio, there is a significant positive influence on its financial performance. First, a healthy loan-to-deposit ratio indicates that the Sacco uses its member deposits efficiently by extending loans to borrowers (Muriuki, 2022). By lending out a considerable portion of the deposits received, the Sacco can generate interest income, its primary source of revenue. This interest income contributes to the profitability and financial sustainability of the Sacco as a whole. In addition, a suitable loan-to-deposit ratio demonstrates the Sacco's capacity to balance risk and liquidity (Otwoko & Maina, 2021). By preserving a balanced ratio, the Sacco ensures that it has sufficient liquid funds (from deposits) to cover potential member withdrawals and other short-term obligations, as well as sufficient loan assets to generate interest income. This balance strengthens the Sacco's resistance to financial disruptions and economic fluctuations, thereby reducing the likelihood of liquidity crises. In addition, a higher loan-to-deposit ratio indicates that the Sacco is effectively meeting the financial requirements of its members (Birgen, Njau, & Magdi, 2023). When Sacco members have access to loans, they are more likely to remain active and devoted to the organization. Members who are satisfied are more likely to continue depositing their savings with the Sacco, which increases the institution's deposit base and strengthens its financial position. In addition, a positive relationship between the loan-to-deposit ratio and financial performance is frequently associated with prudent credit risk management.

Maintaining a loan portfolio that is well-diversified and meticulously evaluated reduces the risk of defaults and non-performing loans. A reduced level of credit risk results in lower provisions for loan losses and enhanced overall asset quality, which has a positive effect on the profitability and capitalization of the Sacco. Lastly, an optimal loan-to-deposit ratio can result in scale economies. By managing its loan portfolio effectively, the Sacco can reduce transaction costs and administrative expenses, thereby increasing operational efficiency. Consequently, the Sacco is able to allocate its resources more efficiently, invest in technology, and expand its service offerings, all of which contribute to an increase in financial performance and member satisfaction.

#### **5.1.4 The moderating effect of board independence on the relationship between liquidity management risks and financial performance of tier-1 Saccos**

The overall object of the study was to examine whether board independence moderated the relationship between liquidity management risks and financial performance of tier-1 Saccos in Kenya.

##### **5.1.4.1 The moderating effect of board independence on the relationship between cash to deposit ratio and financial performance of tier-1 Saccos.**

The first moderating objective was to examine whether board independence moderates the relationship between cash to deposit ratio and financial performance of tier-1 Saccos. The regression results indicated that the interaction term of board independence and cash to deposit ratio had a negative and significant effect on financial performance of tier-1 Saccos in Kenya ( $\beta = -0.1968$ ;  $\rho < 0.05$ ). There are a few different explanations for why board independence has a moderating effect that is counterproductive with regard to the connection between the cash to deposit ratio and the financial performance of Tier-1 Savings and Credit Cooperative Organizations (SACCOs). To begin, according to Firnanti and Karmudiandri (2020), a high level of board independence may result in a

more conservative approach to the process of making financial decisions. Maintaining a significant cash to deposit ratio may be emphasized as a protective measure against potential uncertainties by an independent board that is focused on risk reduction and governance. However, this may limit the amount of funds that are available for investment in opportunities that generate profits.

Second, because of the fiduciary responsibility it holds, an independent board may be more cautious and scrutinizing of potential dangers (Shaikh, Drira, & Hassine, 2019). In this scenario, the board may place a higher priority on liquidity management as a preventative measure against the possibility of experiencing financial trouble. However, this may mistakenly limit the SACCO's ability to channel funds into more lucrative enterprises, which would improve the organization's overall financial performance. In addition, an independent board may interpret a high cash to deposit ratio as a signal that there is cause for concern over liquidity mismatches or member withdrawals. Because of this image, the board of directors may feel pressured to place an emphasis on preserving sufficient liquidity, even if doing so requires them to forego some of the potential returns on investment in the short term. As a consequence of this, the adverse moderation effect manifests itself as a consequence of the independence of the board of directors, which accentuates the emphasis on risk avoidance and the prioritizing of liquidity over aggressive investment plans.

Last but not least, a board that is wholly autonomous might lay a greater focus on aligning itself with the conservative expectations of members, regulators, and stakeholders. This alignment could result in a conservative cash management strategy, which, while protecting the SACCO's reputation and reducing risk, could limit the organization's ability to achieve superior financial performance through the more proactive allocation of resources (Ngeno, 2019).

#### **5.1.4.2 The moderating effect of board independence on the relationship between deposit to total assets ratio and financial performance of tier-1 Saccos.**

The second moderating objective was to examine whether board independence moderates the relationship between deposit to total assets ratio and financial performance of tier-1 Saccos. The regression results indicated that the interaction term of board independence and deposits to total assets ratio had a negative and significant effect on financial performance of tier-1 Saccos in Kenya ( $\beta = -0.3306$ ;  $\rho < 0.05$ ). Several underlying factors account for the negative moderating effect of board independence on the relationship between the deposit to total assets ratio and the financial performance of Tier-1 Savings and Credit Cooperative Organizations (SACCOs). First, a high degree of board independence is frequently associated with a greater emphasis on risk management and prudential governance (Nawaz, Hussain, & Khan, 2023). In this situation, an independent board may prioritize maintaining a higher ratio of deposits to total assets in order to increase liquidity and assure the SACCO's ability to meet member demands during uncertain times. While this strategy provides stability, it may restrict the SACCO's ability to invest in higher-yielding assets that contribute to enhanced financial performance.

Secondly, an independent board may employ a more cautious approach to investments, especially in the case of assets with higher returns but also higher risks. Prioritizing the preservation of the SACCO's reputation and the protection of member interests could result in a preference for less hazardous but lower-yielding investment options, negatively impacting the organization's overall financial performance (Juma & Maseko, 2022). In addition, the fiduciary responsibilities of an independent board may result in a preference for conservative financial practices, such as maintaining a higher proportion of deposits to total assets. While this strategy protects the SACCO's financial stability, it

may hinder the organization's ability to maximize profitability through strategic asset allocation and capital deployment.

#### **5.1.4.3 The moderating effect of board independence on the relationship between loan to deposit ratio and financial performance of tier-1 Saccos.**

The third moderating objective was to examine whether board independence moderates the relationship between loan to deposit ratio and financial performance of tier-1 Saccos. The regression results indicated that the interaction term of board independence and loan to deposit ratio had a negative and significant effect on financial performance of tier-1 Saccos in Kenya ( $\beta = -0.1108$ ;  $p < 0.05$ ). Several fundamental factors may be responsible for the negative moderating effect that board independence has on the relationship between the loan to deposit ratio and the financial performance of Tier-1 Savings and Credit Cooperative Organizations (SACCOs). To begin, a high level of board independence is frequently correlated with a more conservative and risk-averse approach to the process of making financial decisions. An independent board that is focused on good governance and protecting the interests of its members can emphasize mitigating loan-related risks by restricting the loan-to-deposit ratio. This might potentially hamper the SACCO's capacity to extend credit and produce higher interest revenue (Nteere, 2022).

Second, according to Black et al. 2020, an independent board may show heightened worry about the potential consequences of excessive loan exposure. Even though this cautious approach limits the SACCO's potential to achieve greater financial performance through increased lending activities, the board may be inclined to maintain a lower loan to deposit ratio in order to mitigate the risk of default and potential member dissatisfaction. This is because the board is focused on the stability and reputation of the SACCO. In addition, the fiduciary responsibilities of an independent board could result

in a bias for a conservative attitude, with a concentration on protecting member deposits and avoiding exposure to lending risks. Even if such a strategy might lead to more interest income and improved financial performance, this tendency might prevent the SACCO from adopting a higher loan to deposit ratio. This is the case despite the fact that such a strategy could lead to better financial performance.

## **5.2 Conclusions**

This study first objective was to examine whether cash to deposit ratio significantly affect financial performance of tier-1 Saccos. Cash to deposit ratio has shown a positive and significant impact on the financial performance of tier-1 Savings and Credit Cooperative Societies (Saccos) in Kenya. By maintaining a higher cash to deposit ratio, these Saccos have been able to strengthen their liquidity positions, ensuring they have sufficient cash reserves to meet immediate financial obligations and unexpected contingencies. This has enhanced their ability to provide timely and efficient services to their members, leading to improved customer satisfaction and loyalty. Moreover, a healthy cash to deposit ratio has allowed these Saccos to make strategic investments and pursue growth opportunities, further enhancing their overall financial performance. As such, it is evident that maintaining an optimal cash to deposit ratio is a critical factor in driving the success and sustainability of tier-1 Saccos in the Kenyan financial landscape.

Secondly, the deposit to total assets ratio demonstrated a positive and significant impact on the financial performance of tier-1 Savings and Credit Cooperative Societies (Saccos) in Kenya. A higher deposit to total assets ratio indicates that a larger portion of the Saccos' funding comes from member deposits, reflecting a higher level of trust and confidence in the institution from its members. This enhanced level of deposit funding allows saccos to reduce dependency on costly external sources of financing, thus lowering interest expenses and boosting overall profitability. Additionally, a higher



deposit to total assets ratio signifies effective asset-liability management, enabling Saccos to allocate their resources efficiently and invest in income-generating opportunities that align with their members' needs. Consequently, tier-1 Saccos in Kenya with a strong deposit to total assets ratio have exhibited improved financial performance, greater stability, and a solid foundation for sustainable growth in the competitive financial market.

Third, the loan to deposits ratio has shown a positive and significant effect on the financial performance of tier-1 Savings and Credit Cooperative Societies (Saccos) in Kenya. A higher loan to deposits ratio indicates that these Saccos are efficiently utilizing their deposit base to extend loans and credit facilities to their members. This demonstrates their ability to attract and retain members' deposits while deploying those funds effectively to generate income through interest-earning loans. Moreover, a well-managed loan to deposits ratio signifies prudent lending practices and risk management, ensuring that Saccos maintain a healthy balance between loan portfolios and available deposits. By maintaining an optimal loan to deposits ratio, tier-1 Saccos in Kenya have experienced improved interest income, profitability, and overall financial performance, fostering long-term sustainability and value for their members and stakeholders alike.

Lastly, the findings suggest that board independence plays negatively moderates the relationship between liquidity management risks and financial performance of tier-1 Savings and Credit Cooperative Societies (Saccos) in Kenya. A high level of board independence is frequently correlated with a more conservative and risk-averse approach to the process of making financial decisions. An independent board that is focused on good governance and protecting the interests of its members can emphasize mitigating loan-related risks by restricting the loan-to-deposit ratio. This might potentially hamper the SACCO's capacity to extend credit and produce higher interest revenue

## **5.3 Recommendations of the study**

### **5.3.1 Theoretical Implications**

Agency theory suggests that aligning the interests of shareholders (members) and management can help mitigate conflicts and promote better financial performance. Saccos can implement performance-based incentives for management that are tied to key liquidity management metrics, such as the cash to total deposit ratio and loan to deposit ratio. By linking executive compensation to these ratios, management is encouraged to adopt strategies that prioritize prudent liquidity management, balancing the interests of both the Sacco and its members.

Transparent communication and information disclosure are crucial in agency theory. Saccos should provide timely and accurate information on liquidity management ratios, financial performance, and governance practices to members and stakeholders. This transparency helps align the interests of members and management, reduces information asymmetry, and empowers members to hold management accountable for their actions. Improved disclosure also allows members to make informed decisions about their participation in the Sacco.

Liquidity Preference Theory suggests that individuals and institutions prefer to hold liquid assets to meet immediate cash needs. For Saccos, this translates to the need for maintaining a certain level of liquid reserves, as indicated by the cash to total deposit ratio. However, excessively high liquidity can result in lower profitability as idle funds may not be earning optimal returns. Theoretical recommendations for Saccos would be to strike a balance between liquidity and profitability by optimizing the cash to total deposit ratio. This can be achieved by ensuring that sufficient liquidity is maintained to meet short-term obligations while prudently investing surplus funds to maximize interest income.

Liquidity Preference Theory suggests that individuals and institutions prefer to hold liquid assets relative to their total assets. For Saccos, this implies the need to manage both the deposit to total assets ratio and the loan to deposit ratio. An excessively high deposit to total assets ratio may indicate an underutilization of funds, while a high loan to deposit ratio could imply excessive reliance on member deposits for lending. Theoretical recommendations would be for Saccos to maintain an optimal deposit to total assets ratio that reflects efficient utilization of member deposits and a diversified loan to deposit ratio that balances lending activities while safeguarding liquidity.

### **5.3.2 Policy Implication**

Regulators should set appropriate regulatory limits on liquidity management ratios, including the cash to total deposit ratio, deposit to total assets ratio, and loan to deposit ratio. These limits should be based on a comprehensive assessment of the Saccos' risk profiles, financial health, and macroeconomic conditions. By implementing such limits, regulators can encourage Saccos to maintain a balanced and responsible approach to liquidity management, ensuring sufficient liquidity for member withdrawals while mitigating excessive credit risk.

Regulators should emphasize the importance of board independence in Saccos and ensure that governance structures are in place to promote impartial decision-making. This can be achieved by setting clear guidelines on board composition, ensuring that board members have the necessary skills and expertise, and avoiding any conflicts of interest that may compromise the independence of the board. Independent boards are better equipped to oversee liquidity management practices and make strategic decisions that positively impact financial performance.

Regulators can offer guidance and capacity building programs to Saccos to improve their liquidity management practices and corporate governance. Workshops, seminars, and training sessions can help Sacco management and board members understand best practices in liquidity management, risk mitigation, and governance. Strengthening the capabilities of Saccos contributes to a more robust financial sector and enhances the overall stability of the cooperative system.

### **5.3.3 Managerial Implication.**

Saccos should aim to strike a balance between maintaining sufficient liquidity and maximizing the deployment of funds for lending and investment. To achieve this, management should regularly assess and monitor the cash to total deposit ratio and the deposit to total assets ratio. By ensuring an adequate cash to total deposit ratio, Saccos can meet short-term obligations promptly, reducing the risk of liquidity shortages. Concurrently, optimizing the deposit to total assets ratio can help the Sacco make the most of member deposits for lending, thereby increasing interest income and enhancing financial performance.

Effective liquidity management is closely tied to credit risk management. To mitigate credit risk, Saccos should establish robust lending policies and procedures, focusing on assessing the creditworthiness of potential borrowers. Adequate diversification of the loan portfolio across different sectors and risk profiles can help spread risk and reduce the impact of defaults. Regularly monitoring the loan to deposit ratio and managing it in line with risk appetite will enable Saccos to maintain a healthy loan portfolio and improve overall financial performance.

Saccos should prioritize ensuring the independence of their board of directors. This can be achieved through transparent selection processes, proper training of board members,

and promoting a culture of impartiality and accountability. An independent board is better positioned to provide effective oversight, implement prudent financial strategies, and promote transparency, all of which positively influence financial performance. Saccos should actively encourage diversity on their boards, including representatives from various professional backgrounds, to ensure well-rounded decision-making.

To further enhance the understanding of liquidity management risks and financial performance, Saccos should consider the impact of macroeconomic factors on their operations. Factors such as interest rate fluctuations, inflation, and economic growth can influence liquidity and credit risk. Analyzing the effects of these external variables and devising appropriate strategies to navigate through various economic conditions can help Saccos build resilience and improve financial performance

#### **5.4 Limitations of the Study**

While the study on liquidity management risks, board independence, and financial performance of Tier-1 Savings and Credit Cooperatives (Saccos) in Kenya provides valuable insights into the relationship between these factors, there are some limitations and areas for further research. One limitation is that the study might have focused solely on Tier-1 Saccos in Kenya, potentially limiting the generalizability of the findings to Saccos in other countries or different tiers. Additionally, the research might not have considered external macroeconomic factors that could influence liquidity management and financial performance.

#### **5.5 Areas for Future Research**

Further research could explore the impact of regulatory frameworks and governance structures on the relationship between liquidity management and financial performance.

In addition, studies may conduct comparative studies across different countries and tiers of Saccos could provide a more comprehensive understanding of the subject matter.

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## Appendix II: Regression Results

Random-effects GLS regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.1722	Obs per group:	=	10
	min		
between = 0.2938	avg	=	10.0
overall = 0.2278	max	=	10
	Wald chi2(2)	=	66.97
corr(u <sub>i</sub> , X) = 0 (assumed)	Prob > chi2	=	0.0000

ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
FS	.8094118	.1011164	8.00	0.000	.6112273 1.007596
FA	-.0531378	.0127672	-4.16	0.000	-.0781611 -.0281145
_cons	-1.452176	.2058168	-7.06	0.000	-1.855569 -1.048782
sigma_u	.0294898				
sigma_e	.03666912				
Rho	.39274673 (fraction of variance due to u <sub>i</sub> )				

Fixed-effects (within) regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.1822	Obs per group: min	=	10
between = 0.2259	avg	=	10.0
overall = 0.1796	max	=	10
	F(2,268)	=	29.85
corr(u <sub>i</sub> , X <sub>b</sub> ) = -0.4917	Prob > F	=	0.0000

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FA	-.0958219	.0233306	-4.11	0.000	-.1417564 -.0498875
FS	.8854982	.1148568	7.71	0.000	.6593618 1.111635
_cons	-1.463305	.2182546	-6.70	0.000	-1.893017 -1.033594
sigma_u	.03881822				
sigma_e	.03666912				
rho	.52844666 (fraction of variance due to u <sub>i</sub> )				

F test that all u<sub>i</sub>=0: F(29, 268) = 7.22 Prob > F = 0.0000

---- Coefficients ----				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	Re	Difference	S.E.
FA	-.0958219	-.0531378	-.0426841	.0195272
FS	.8854982	.8094118	.0760865	.0544753

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg  
 Test: Ho: difference in coefficients not systematic  
 $\chi^2(2) = (b-B)'[(V_b-V_B)^{-1}](b-B)$   
 = 5.17  
 Prob>chi2 = 0.0755

Random-effects GLS regression	Number of obs =	300
Group variable: ID	Number of groups =	30
R-sq: within = 0.4064	Obs per group: min	10
	=	
between = 0.3587	avg =	10.0
overall = 0.3823	max =	10
	Wald chi2(5) =	197.40
corr(u_i, X) = 0 (assumed)	Prob > chi2 =	0.0000

ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
FS	.4992985	.0933837	5.35	0.000	.3162698 .6823272
FA	-.0441306	.0120776	-3.65	0.000	-.0678022 -.020459
CDT	.1537982	.0306795	5.01	0.000	.0936675 .2139289
DTA	.1464457	.0293016	5.00	0.000	.0890156 .2038759
LTD	.0319026	.0074505	4.28	0.000	.0172999 .0465053
_cons	-1.048089	.1830446	-5.73	0.000	-1.40685 -.6893286
sigma_u	.02872308				
sigma_e	.03130846				
Rho	.45701265				(fraction of variance due to u_i)

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Fixed-effects (within) regression      Number of obs      = 300

Group variable: ID                      Number of groups   = 30

R-sq: within = 0.4105                  Obs per group:      = 10  
min

between = 0.3010                      avg                      = 10.0

overall = 0.3410                      max                      = 10

    F(5,265)                = 36.91

corr(u\_i, Xb) = -0.2731              Prob > F                = 0.0000

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FA	-.0679399	.0201747	-3.37	0.001	-.1076629   -0.0282169
FS	.5108178	.1053156	4.85	0.000	.303456   .7181796
CDT	.1450261	.0317014	4.57	0.000	.0826074   .2074448
DTA	.1578238	.0311984	5.06	0.000	.0963956   .2192521
LTD	.0338473	.0079443	4.26	0.000	.0182054   .0494892
_cons	-.9931675	.1934195	-5.13	0.000	-1.374002   -.6123329
sigma_u	.03320614				
sigma_e	.03130846				
Rho	.52938932 (fraction of variance due to u_i)				

F test that all u\_i=0:    F(29, 265) =    8.53              Prob > F = 0.0000

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---- Coefficients ----				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
FA	-.0679399	-.0441306	-.0238093	.0161601
FS	.5108178	.4992985	.0115193	.0486915
CDT	.1450261	.1537982	-.0087721	.0079842
DTA	.1578238	.1464457	.0113781	.0107123
LTD	.0338473	.0319026	.0019448	.0027571

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(5) = (b-B)[(V_b-V_B)^{-1}](b-B)$$

$$= 6.15$$

$$\text{Prob}>\chi^2 = 0.2919$$


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Random-effects GLS regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.4423	Obs per group: min	=	10
between = 0.4702	avg	=	10.0
overall = 0.4492	max	=	10
	Wald chi2(6)	=	232.26
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000

ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FS	.4163141	.0920472	4.52	0.000	.2359049	.5967234
FA	-.0414662	.0116144	-3.57	0.000	-.0642301	-.0187023
CDT	.1465944	.0297266	4.93	0.000	.0883313	.2048574
DTA	.1405332	.0283576	4.96	0.000	.0849533	.1961131
LTD	.0238218	.0074106	3.21	0.001	.0092973	.0383463
BI	.0822246	.0178101	4.62	0.000	.0473175	.1171316
_cons	-.8844997	.1806041	-4.90	0.000	-1.238477	-.5305222
sigma_u	.02748271					
sigma_e	.03038955					
Rho	.44989791					(fraction of variance due to u_i)

Random-effects GLS regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.4423	Obs per group: min	=	10
between = 0.4702	avg	=	10.0
overall = 0.4492	max	=	10
	Wald chi2(6)	=	232.26
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000

ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
FA	-.0414662	.0116144	-3.57	0.000	-.0642301	-.0187023
FS	.4163141	.0920472	4.52	0.000	.2359049	.5967234
CDT	.1465944	.0297266	4.93	0.000	.0883313	.2048574
DTA	.1405332	.0283576	4.96	0.000	.0849533	.1961131
LTD	.0238218	.0074106	3.21	0.001	.0092973	.0383463
BI	.0822246	.0178101	4.62	0.000	.0473175	.1171316
_cons	-.8844997	.1806041	-4.90	0.000	-1.238477	-.5305222
sigma_u	.02748271					
sigma_e	.03038955					
rho	.44989791					(fraction of variance due to u_i)

---

Fixed-effects (within) regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.4467	Obs per group: min	=	10
between = 0.4241	avg	=	10.0
overall = 0.4127	max	=	10
	F(6,264)	=	35.52
corr(u_i, Xb) = -0.3862	Prob > F	=	0.0000

ROA	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
FA	-.0686567	.0195833	-3.51	0.001	-.107216	-.0300974
FS	.4643258	.102835	4.52	0.000	.2618447	.6668068
CDT	.1365632	.0308383	4.43	0.000	.0758429	.1972835
DTA	.1504464	.0303347	4.96	0.000	.0907177	.2101751
LTD	.0255972	.0079626	3.21	0.001	.009919	.0412754
BI	.0874026	.0210329	4.16	0.000	.045989	.1288162
_cons	-.8947799	.1892297	-4.73	0.000	-1.267371	-.5221885
sigma_u	.03192024					
sigma_e	.03038955					
Rho	.52455098 (fraction of variance due to u_i)					

F test that all u\_i=0: F(29, 264) = 7.85 Prob > F = 0.0000

	---- Coefficients ----			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
FA	-.0686567	-.0414662	-.0271906	.0157674
FS	.4643258	.4163141	.0480116	.0458513
CDT	.1365632	.1465944	-.0100311	.0082054
DTA	.1504464	.1405332	.0099132	.0107721
LTD	.0255972	.0238218	.0017754	.002913
BI	.0874026	.0822246	.005178	.0111886

---

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg  
 Test: Ho: difference in coefficients not systematic  
 $\chi^2(6) = (b-B)'[(V_b-V_B)^{-1}](b-B)$   
 = 5.61  
 Prob>chi2 = 0.4686

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Fixed-effects (within) regression	Number of obs	= 300
Group variable: ID	Number of groups	= 30
R-sq: within = 0.4556	Obs per group:	= 10
	min	
between = 0.4014	avg	= 10.0
overall = 0.3958	max	= 10
	F(7,263)	= 31.44
corr(u_i, Xb) = -0.4653	Prob > F	= 0.0000

---

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FA	-.0774159	.019914	-3.89	0.000	-.1166272 -.0382047
FS	.4824068	.1025673	4.70	0.000	.2804492 .6843645
CDT	.106015	.0339979	3.12	0.002	.0390723 .1729577
DTA	.1385438	.030687	4.51	0.000	.0781203 .1989673
LTD	.0244662	.0079319	3.08	0.002	.0088481 .0400843
BI	.0829281	.0210133	3.95	0.000	.0415525 .1243037
CDT*BI	-.222995	.1074391	-2.08	0.039	-.4345453 -.0114447
_cons	-.8736673	.1883301	-4.64	0.000	-1.244494 -.5028406
sigma_u	.03444322				
sigma_e	.03020093				
rho	.56534391 (fraction of variance due to u_i)				

---

F test that all u\_i=0: F(29, 263) = 7.97 Prob > F = 0.0000

---

	---- Coefficients ----			
	(b) fe	(B) Re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
FA	-.0774159	-.0422843	-.0351316	.0161542
FS	.4824068	.415591	.0668158	.0457217
CDT	.106015	.1239942	-.0179792	.0096019
DTA	.1385438	.1319652	.0065786	.0106504
LTD	.0244662	.0229159	.0015503	.0028204
BI	.0829281	.079185	.0037431	.011027
CDT*BI	-.222995	-.1712807	-.0517143	.0274655

---

---

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg  
 Test: Ho: difference in coefficients not systematic  
 $\chi^2(7) = (b-B)'[(V_b - V_B)^{-1}](b-B)$   
 = 8.61  
 Prob>chi2 = 0.2815

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Random-effects GLS regression      Number of obs      = 300  
 Group variable: ID                      Number of groups = 30  
 R-sq: within = 0.4719                    Obs per group:      = 10  
     min  
 between = 0.5033                         avg                    = 10.0  
 overall = 0.4829                         max                    = 10  
     Wald chi2(8)         = 261.29  
 corr(u\_i, X) = 0 (assumed)      Prob > chi2           = 0.0000

---

ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
FA	-.0406588	.0114019	-3.57	0.000	-.0630061    -.0183116	
FS	.4067729	.0898324	4.53	0.000	.2307047    .5828412	
CDT	.1211114	.0319075	3.80	0.000	.0585739    .1836489	
DTA	.0972842	.0296127	3.29	0.001	.0392444    .155324	
LTD	.019534	.0073064	2.67	0.008	.0052138    .0338543	
BI	.0670175	.017792	3.77	0.000	.0321457    .1018892	
CDT*BI	-.1797459	.1016132	-1.77	0.077	-.3789041    .0194124	
DTA*BI	-.2959335	.0784316	-3.77	0.000	-.4496566    -.1422105	
_cons	-.8158247	.177117	-4.61	0.000	-1.162968    -.4686818	
sigma_u	.02706579					
sigma_e	.029594					
rho	.45546784 (fraction of variance due to u_i)					

---



Fixed-effects (within) regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.4793	Obs per group: min	=	10
between = 0.4116	avg	=	10.0
overall = 0.4142	max	=	10
	F(8,262)	=	30.14
corr(u_i, Xb) = -0.4485	Prob > F	=	0.0000

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FA	-.0773403	.0195139	-3.96	0.000	-.1157642 -.0389163
FS	.4752651	.1005274	4.73	0.000	.2773206 .6732096
CDT	.1055708	.0333149	3.17	0.002	.0399718 .1711698
DTA	.1020558	.0318767	3.20	0.002	.0392887 .1648228
LTD	.0208447	.0078431	2.66	0.008	.0054012 .0362882
BI	.0691002	.0209776	3.29	0.001	.0277941 .1104063
CDT*BI	-.2331022	.1053207	-2.21	0.028	-.4404851 -.0257194
DTA*BI	-.2785884	.0807652	-3.45	0.001	-.4376199 -.1195569
_cons	-.8279285	.1850211	-4.47	0.000	-1.192246 -.463611
sigma_u	.03378421				
sigma_e	.029594				
Rho	.56582664 (fraction of variance due to u_i)				

F test that all u\_i=0: F(29, 262) = 7.54 Prob > F = 0.0000

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fe	Re	Difference	S.E.
FA	-.0773403	-.0406588	-.0366814	.0158363
FS	.4752651	.4067729	.0684921	.045121
CDT	.1055708	.1211114	-.0155406	.009581
DTA	.1020558	.0972842	.0047716	.0117988
LTD	.0208447	.019534	.0013107	.0028514
BI	.0691002	.0670175	.0020827	.0111131
CDT*BI	-.2331022	-.1797459	-.0533564	.0276986
DTA*BI	-.2785884	-.2959335	.0173452	.0192745

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(8) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 7.94$$

$$\text{Prob} > \chi^2 = 0.4393$$

Random-effects GLS regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.4974	Obs per group: min	=	10
between = 0.4896	avg	=	10.0
overall = 0.4837	max	=	10
	Wald chi2(9)	=	281.92
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000

ROA	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
FS	.4034719	.0884462	4.56	0.000	.2301204 .5768233
FA	-.0396416	.0115008	-3.45	0.001	-.0621827 -.0171005
CDT	.1027852	.0317603	3.24	0.001	.0405362 .1650343
DTA	.0776554	.0297716	2.61	0.009	.0193042 .1360066
LTD	.01749	.0072216	2.42	0.015	.003336 .0316439
BI	.083887	.0183147	4.58	0.000	.0479909 .119783
BI*CDT	-.1967645	.0997162	-1.97	0.048	-.3922047 -.0013244
BI*DTA	-.3306325	.0777014	-4.26	0.000	-.4829243 -.1783406
BI*LTD	-.1107923	.0328139	-3.38	0.001	-.1751064 -.0464781
_cons	-.7873085	.1741512	-4.52	0.000	-1.128639 -.4459784
sigma_u	.02786434				
sigma_e	.02893547				
Rho	.48114886 (fraction of variance due to u_i)				

Fixed-effects (within) regression	Number of obs	=	300
Group variable: ID	Number of groups	=	30
R-sq: within = 0.5041	Obs per group: min	=	10
between = 0.4297	avg	=	10.0
overall = 0.4316	max	=	10
	F(9,261)	=	29.48
corr(u_i, Xb) = -0.4805	Prob > F	=	0.0000

ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
FA	-.0722305	.0191319	-3.78	0.000	-.1099031 -.0345579
FS	.4610696	.0983689	4.69	0.000	.2673719 .6547673
CDT	.0843953	.0330963	2.55	0.011	.0192255 .1495651
DTA	.0833786	.0315929	2.64	0.009	.0211692 .145588
LTD	.01894	.0076866	2.46	0.014	.0038043 .0340758
BI	.0951346	.021739	4.38	0.000	.0523284 .1379408
CDT*BI	-.2473903	.103053	-2.40	0.017	-.4503114 -.0444692
DTA*BI	-.3084743	.0793998	-3.89	0.000	-.46482 -.1521286
LTD*BI	-.1253322	.0346793	-3.61	0.000	-.1936189 -.0570454
_cons	-.7916711	.1811819	-4.37	0.000	-1.148435 -.4349067
sigma_u	.03419126				
sigma_e	.02893547				
rho	.58268466 (fraction of variance due to u_i)				

F test that all u\_i=0: F(29, 261) = 8.12 Prob > F = 0.0000

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
FA	-.0722305	-.0396416	-.0325889	.0152893
FS	.4610696	.4034719	.0575977	.0430547
CDT	.0843953	.1027852	-.0183899	.0093086
DTA	.0833786	.0776554	.0057232	.0105719
LTD	.01894	.01749	.0014501	.0026332
BI	.0951346	.083887	.0112476	.0117114
CDT*BI	-.2473903	-.1967645	-.0506257	.0260116
DTA*BI	-.3084743	-.3306325	.0221582	.0163348
LTD*BI	-.1253322	-.1107923	-.0145399	.0112204

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg  
 Test: Ho: difference in coefficients not systematic  
 $\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$   
 = 9.75  
 Prob>chi2 = 0.3711

### Appendix III: Moi University Introductory letter



**MOI UNIVERSITY  
POSTGRADUATE OFFICE  
SCHOOL OF BUSINESS AND ECONOMICS**

Tel: 0790940508  
0771306914  
0756138770  
Fax No: (055) 43047  
Telex No. MOIUNIVERSITY 35047

P.O. Box 3900  
Eldoret.  
Kenya

RE: MU/SBE/PGR/ACD/218

DATE: 7<sup>th</sup> July, 2023

**TO WHOM IT MAY CONCERN:**

**RE: PHILIP LEAKEY OKELLO - SBE/MBA/2002/16**

The above named is a bonafide student of Moi University, School of Business & Economics. He is undertaking Masters in Business Administration (MBA) degree, specializing in **Finance**.

Mr. Okello successfully completed coursework and has defended his proposal. He is proceeding to the field to collect data for his research titled: "*Liquidity Management Risks, Board Independence and Financial Performance of Savings and Credit Cooperatives (SACCOS) in Kenya*".

Any assistance accorded to him will be highly appreciated.

Yours faithfully,

  
 DEAN  
 School of Business and Economics  
 MOI UNIVERSITY

**DR. RONALD BONUKE**  
**ASSOCIATE DEAN AND CHAIR-POSTGRADUATE STUDIES**

/s/





(s...)



ISO 9001:2015 Certified Institution



Appendix IV: NACOSTI License


**REPUBLIC OF KENYA**  
 Ref No: **327736**  
**RESEARCH LICENSE**  
  
**This is to Certify that Mr.. PHILIP LEAKEY OKELLO of Moi University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: LIQUIDITY MANAGEMENT RISKS, BOARD INDEPENDENCE AND FINANCIAL PERFORMANCE OF TIER ONE SAVINGS AND CREDIT COOPERATIVES (SACCOS) IN KENYA for the period ending : 25/July/2024.**  
 License No: **NACOSTI/P/23/27896**  
**327736**  
 Applicant Identification Number  
  
 Director General  
**NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION**  
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**THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)**  
 Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

**he National Commission for Science, Technology and Innovation**, hereafter referred to as the Commission, was the established under the science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

**CONDITIONS OF THE RESEARCH LICENSE**

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of international treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
  - i. Endanger national security
  - ii. Adversely affect the lives of Kenyans
  - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
  - iv. Result in exploitation of intellectual property rights of communities in Kenya
  - v. Adversely affect the environment
  - vi. Adversely affect the rights of communities
  - vii. Endanger public safety and national cohesion
  - viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
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14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and  
 Innovation(NACOSTI),  
 Off Waiyaki Way, Upper Kabete,  
 P. O. Box 30623 - 00100 Nairobi, KENYA  
 Telephone: 020 4007000, 0713788787, 0735404245  
 E-mail: dg@nacosti.go.ke  
 Website: www.nacosti.go.ke

## Appendix V: List of SACCOs

1. K-Rep Sacco Society Ltd
2. Stima Sacco Society Ltd
3. Ekeza Sacco Society Ltd
4. Uwezo Sacco Society Ltd
5. Ngao Sacco Society Ltd
6. Nzoia Sacco Society Ltd
7. Musoni Sacco Society Ltd
8. Kenya Police Sacco Society Ltd
9. Kenya Post Office Savings Bank Sacco Society Ltd
10. Kenya Power & Lighting Company Sacco Society Ltd
11. K-Unity Sacco Society Ltd
12. Kenya Prisons Sacco Society Ltd
13. Mumias Sugar Company Sacco Society Ltd
14. Kilimambogo Sacco Society Ltd
15. Chai Sacco Society Ltd
16. Ushirika Sacco Society Ltd
17. Central Organization Of Trade Unions Sacco Society Ltd
18. Kenya Tea Development Agency Sacco Society Ltd
19. Kuscco Sacco Society Ltd
20. East African Portland Cement Company Sacco Society Ltd
21. Umoja Sacco Ltd
22. Kucref Sacco Society Ltd
23. Mwalimu National Sacco Society Ltd
24. Ufungamano Sacco Society Ltd
25. Kenya Union of Savings & Credit Co-Operative Ltd
26. Wakulima Sacco Society Limited
27. Eagle's Eye Regulated Nwdt Sacco Society Limited
28. Dudu Regulated Nwdt Sacco Society Limited
29. Digital Media Regulated Nwdt Sacco Society Limited
30. Dhl Regulated Nwdt Sacco Society Limited
31. Dhamini Regulated Nwdt Sacco Society Limited
32. Devco Regulated Nwdt Sacco Society Limited
33. Davis & Shirliff Regulated Nwdt Sacco Society Limited
34. Cotts Regulated Nwdt Sacco Society Limited
35. Co-Operative Bank Regulated Nwdt Sacco Society Limited
36. Concorde Regulated Nwdt Sacco Society Limited
37. Communications Regulated Nwdt Sacco Society Limited
38. Cocotech Regulated Nwdt Sacco Society Limited
39. Cic Regulated Nwdt Sacco Society Limited
40. Christian Entrepreneurs Regulated Nwdt Sacco Society Limited
41. Christian Entrepreneurs Regulated Nwdt Sacco Society Limited
42. Cdf Regulated Nwdt Sacco Society Limited
43. Bunista Regulated Nwdt Sacco Society Limited
44. Bunge Regulated Nwdt Sacco Society Limited

## Appendix VI: Plagiarism Similarity Index

Philip Leakey Okello SBE/MBA/2002/16

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