

**PRUDENTIAL REGULATION AND FINANCIAL HEALTH OF DEPOSIT
TAKING SAVINGS AND CREDIT COOPERATIVE SOCIETIES IN KENYA**

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DECLARATION

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DEDICATION

This thesis is dedicated to my wife Catherine, daughter Georgina and son George for their understanding, encouragement and support during the entire duration of carrying out this study, which was coupled with absence in the family and financial constraints. Additionally, it is dedicated to my mother Jacinta for her ceaseless encouragement and love for academic achievement and finally to my siblings, who were a source of motivation that kept me going.

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OPERATIONAL DEFINITION OF TERMS

Asset Quality The quality of existing loan portfolio that reflects how well borrowers are servicing their loans by binding to their loan repayment agreements. Asset quality is determined by the non-performing loans in relation to the gross loans and was be measured by dividing the prevailing non-performing loans with gross loans.

Capital Adequacy Capital that indicates the stability and strength of a financial institution and reflects its ability to respond to liabilities as well as operational costs in a timely manner to avoid insolvency. Capital adequate covers potential risks and protects investors interests against unforeseen losses as a buffer by ensuring continuous operation even in times of financial difficulties. It was measured by dividing the core capital by the total assets.

Core Capital Capital that cannot be dispensed unless there is liquidation of the financial institution. Such capital comprises of the fully paid-up shares by members, the issued capital, the disclosed reserves, retained earnings and grants and donations.

Deposits Taking SACCOs Savings and credit cooperative societies that undertake both the back-office services activities as well as front office services activities.

Economic Development The process of improving the economic quality and well-being of a nation, or community or individual through targeted policies, programs, activities or interventions

Financial Crisis Liquidity shortage in a financial institution that makes it unable to meet the primary obligation to its depositors such as giving out new loans and refund of their deposits. It can occur when investors dispose off their assets or withdraw savings and deposits due to fear that the value of their assets might drop or

the financial institution might be liquidated. It is often associated with panics or bank runs.

Financial health A measure that reflects how adequately a financial institution exploits its available resources at its disposal in the generation of revenue during the financial intermediation process. A healthy institution should be able to honour its financial commitments, invest for your future and resist economic shocks. Financial health will be indicated by return on assets and measured by earnings before interest and tax divided by total assets.

Financial Inclusion Accessibility and usability of cheap, convenient and sufficient financial products and services by organisations as well as the general public which ensures wider utilization by all sections of public. Such products and services should be dispatched in an accountable and a tenable way.

Financial Intermediation The process by which a financial institution receives funds from members with excess liquidity in form of savings and subsequently lends it out in form of loans to members with liquidity deficit and intend to have extra funds.

Financial Obligation Responsibility of a financial institution to advance loans to deserving and qualified members as well as refunding their deposits on demand. Other responsibilities include payment of operational costs and accruing debts incurred.

Financial Stability The ability of a financial institution to withstand the unraveling financial shocks both internally and externally. A stable financial institution is adequately sound to discharge its financial intermediation function sufficiently, without reinforcement or influence from external institutions. Financial Stability is indicated by predetermined ratios of asset quality, capital adequacy, and liquidity set by regulator.

Firm Size Total assets controlled by a financial institution and reflect the level of economies of scale, the scale of operation and the market share of an institution in the financial sector. It is reflected by an aggregate of cash and cash equivalents, loans to members, financial investments, property, plants and equipment.

Institutional Capital Part of the core capital comprising of disclosed reserves, retained earnings, grants and donations. The capital is not meant to be expended unless on the liquidation of a savings and credit cooperative society. Institutional capital is equivalent to the difference between the core capital and the members' share capital.

Liquidity The level of cash and other liquid assets set to meet the day-to-day financial commitments of a financial institution during the financial intermediation such as advancement of loans to members, refund of members deposit as well as meeting other operational cash related commitments. Liquidity will be measured by dividing liquid assets by total deposit and short-term liabilities.

Non-Performing Loans Defaulted loans that are currently not being serviced beyond one day of loan contract. Such loans have the likelihood of not being paid by the borrower and hence the institutions are obligated to set aside a certain percentage of provision for loss from their revenue to cater for such loans. The level of non-performing loans determines the financial health of an institution.

Portfolio at Risk Ratio that reflects the level of asset quality in terms of non-performing loans of a financial institution. The ratio also measures the level of credit risk was computed by dividing the total outstanding loan balances by the total gross credit that have been loaned out by a financial institution at a particular time.

Provision for Loan Loss Amount deducted from the revenue generated by a financial institution to cater for a pre-determined percentage of the non-performing loans that have not been serviced as per the loan agreement. Non-performing loans are categorized as performing, watch, substandard, doubtful and loss category. Each category has a particular percentage of provision.

Prudential Regulations Regulations set by the regulatory authority/body to guide and supervise financial institutions in their day-to-day financial intermediation activities. Financial institutions are required to adhere to these regulations in order to maintain their financial stability at an individual level also ensure that there is stability at the sectoral and the market level.

Regulated SACCOs These are both the deposit taking and the non-withdrawable deposit taking savings and credit cooperatives that are regulated by the savings and credit co-operatives societies regulatory authority (SASRA)

Return on Assets Ratio that reflects the efficiency in which a financial institution generates revenue by utilizing the available resources in its disposal. It measures the effectiveness of management in the generation of revenues from the assets it controls. Maximisation of asset utilisation while controlling cost implies high return on assets.

Technical Efficiency A measure that reflects how well a financial institution transforms inputs into outputs. Technical efficiency indicates the rate of transformation of outputs from a least inputs combination. Technical efficiency will be calculated using data envelopment analysis.

ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
AQ	Asset Quality
ATM	Automated Teller Machine
BUETA	Bottom-Up Economic Transformation Agenda
BLUE	Best Linear Unbiased Estimator
BOPO	Ratio of Operating Expenses and Operating Income
BOSA	Back Office Services Activity
CA	Capital Adequacy
CAR	Capital Adequacy Ratio
CAMEL	Capital Adequacy, Asset Quality, Management Quality, Earnings & Liquidity
CEO	Chief Executive Officer
CRB	Credit Reference Bureau
DT SACCOs	Deposit Taking Savings and Credit Cooperatives
NWDT SACCOs	Non-Withdrawable Deposit Taking Savings and Credit Cooperatives
DV	Dependent Variable
EU	European Union
FEM	Fixed Effects Model
FSS	Financial Services Sector
FOSA	Front Office Services Activity
GDP	Gross Domestic Product

GMM	Generalized Methods of Moments
ICA	International Cooperative Alliance
ICT	Information Communication Technology
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IV	Independent Variable
IRA	Insurance Regulatory Authority
KSH	Kenya Shillings
LLP	Loan Loss Provision
LQ	Liquidity
LM	Lagrange Multiplier
LTA	Loans to Assets Ratio
LTR	Loans to Deposit Ratio
MCR	Minimum Capital Requirement
MDGs	Millenium Development Goals
MFBs	Microfinance Banks
MFI s	Microfinance Institutions
MSMEs	Micro, Small and Medium-Sized Enterprises
MTP	Medium Term Plan in the Kenya's Vision 2030
NACOSTI	National Commission for Science, Technology and Innovation
NI	Net Income
NIM	Net Interest Margin

NPLs	Non-performing Loans
OLS	Ordinary Least Squares
P/E RATIO	Price-Earnings Ratio
REG	Regulation
REM	Random Effects Model
ROA	Return on Assets
ROC	Return on Capital
ROE	Return on Equity
ROCE	Return on Capital Employed
SASRA	SACCO Societies Regulatory Authority
SMART	Specific, Measurable, Achievable, Realistic and Time-bound
SPSS	Statistical package for the social sciences
SSA	SACCO Societies Act No. 14 of 2008
STATA	Statistics and Data
TD	Total Deposit
TE	Technical Efficiency
TL	Total Loans
USA	United States of America
USD	United States Dollars
VIF	Vector Inflation Factor
WOCCU	World Council of Credit Unions

ABSTRACT

Deposits taking savings and credit cooperatives societies segment plays a significant role in the country's economic growth and the stability of its financial system. It promotes saving, investment and financial inclusion through financial intermediation. Though there exist prudential regulation that guides these financial institutions, some have had their licenses revoked, while others had their licenses renewed conditionally. In addition, the of trend of the segment's financial health as reflected by return on assets has been fluctuating, implying that the segment has not been continuously optimising utilization of the assets at its disposal. This makes the financial forecasting and planning of the segment challenging. The general objective of the study was to investigate the effect of prudential regulation on the financial health of deposit taking savings and credit cooperatives in Kenya. The specific objectives were to establish the effect of asset quality on financial health; to establish the effect of capital adequacy on financial health; to determine the effect of liquidity on financial health and to determine the moderation effect of technical efficiency on the relationship between prudential regulation and financial health of deposit taking savings and credit cooperatives in Kenya. The study was guided by Financial Instability Hypothesis, Disruptive Innovation Theory, Shareholders Theory, Capital Buffer theory, Information Asymmetry Theory, Liquidity Shiftability Theory and Efficiency Structure Theory. The study inclined toward positivism philosophy and adopted explanatory research design. Secondary data for period 2018 to 2022 were collected using data extraction sheets. The target population was one hundred and seventy-six while the sample size was one hundred and fifty-nine, derived by utilizing inclusion exclusion criteria. Data was analyzed using STATA, where both descriptive statistics and inferential analysis were conducted. Diagnostic tests carried out included the test of normality, heteroskedasticity, multicollinearity, autocorrelation, stationarity and the Hausman test. Descriptive statistics summarised the panel data in terms of means, standard deviations, maximum and minimum figures. Inferential analysis carried out regression analysis and tested hypotheses to draw conclusion. Results from data analysis were presented in tables and figures. Results showed that asset quality had mean value of 0.1163,6 a p-value of 0.000 and a beta value of -0.08680, implying that asset quality has significant effect on financial health. On the other hand, capital adequacy had mean value of 0.2256, a p-value of 0.000, with a beta coefficient of 0.02924, implying that capital adequacy has significant effect on financial health. Liquidity had mean value of 0.2263, a p-value of 0.013, with a beta coefficient of 0.002548, implying that liquidity has significant effect on financial health. Technical efficiency was found to have no significant moderating effect on the relationship between prudential regulation and financial health. From the findings, the study recommends these institutions to strategically restructure their credit policies as per the main sector from which they draw their membership from, to contain the surge of non-performing loans. Again, they should constantly evaluate their capital requirements and adjust their capital levels according to their plans to ensure that the capital levels always comply with the set regulatory requirements. Moreover, they should monitor their cash flows and maintain a liquidity buffer. Management of the institutions can utilise the findings to intensify and optimize the utilization of available resources, while the government and the regulator can utilise these findings for policy formulation in order to improve the financial health of the deposit taking savings and credit cooperatives in Kenya. Additionally, the management of related financial institutions carrying out deposit taking business can exploit these findings to formulate policies and promote the financial health of their institutions.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Investors are mainly interested in the financial health of the organizations in which they invest their funds (Nwanji, Howell, Faye, Otekunrin, Eluyela, Lawal & Eze, 2020; Umukoro, Uwuigbe, Obigbemi, & Uwuigbe, 2020). Financial health indicates the level of financial achievements made by an organization in a certain duration where predetermined targets, standards and criteria indicators are compared against those of the current operational period for trend analysis (Kliestik, Valaskova, Lazaroiu, Kovacova, & Vrbka, 2020; Afrizal, 2018). This gives an insight as to whether or not an organisation is continually achieving its ultimate goal of wealth maximization for the investors (Kulkarni, 2022). Sound financial health rewards members through high dividends and interest, which in turn inspires more savings, thereby catalysing economic development. On the contrary, poor financial health results in failure of organizations, with negative ripple effect that can lead to economic crisis (Mehdi, Lassoued, & Ferchichi, 2024). Thus, financial institutions play a major role not only in reward investors by uplifting their social status but also determine the economic growth in a country (Hazwan, 2020). Financial institutions should therefore strive to enhance their financial health for grow and stability of their economies (Adegboye, Ojeka & Adegboye, 2020).

The Global financial crisis of 2007-2008 and the Asian financial crisis in the 1990's had major impact on the global economy (Saktinil & Kemme, 2020). The two financial crises resulted into financial instability of financial institutions of major economies thereby shaking their financial sectors and subsequently affecting the global economy (Needham & Needham, 2023). These crises prompted a rethink of financial regulation in the European Union and other jurisdictions (Pagliari & Wilf, 2021; Wellink, 2023). They also evoked many researchers to investigate on financial health and efficiency of alternative banking systems in order to avert re-occurrence of similar crises (Vincenzo, 2023). This is because the stability of a country's financial sector promotes the efficiency of financial intermediation role as well as the economic growth (Yakubu, Abokor & Gedik Balay, 2021). On the contrary, financial instability of financial institutions impedes and constrains the financial system, negatively impacting on the economic growth of a country (Giakoumatos & Petropoulos, 2019; Aman, Anwar, Khan, Haddad, Al-Ramahi & Khan, 2024).

The functional responsibility of macroeconomic management aims at maintaining the stability a country's financial system, where such responsibility is allocated to the central banks and public authorities (European Central Bank, 2016). Policy makers and academic circles have shown much attention to the financial stability of financial institutions (Acharya & Richardson, 2012; Allen, Carletti, Goldstein, & Leonello, 2018). This is because financial instability of financial institutions can threaten and cause losses to an economy through its operating mechanisms, triggering financial crisis that can devastate and destabilise an economy (Gupta & Kashiramka, 2020). It is therefore critical to enhance financial stability of financial institutions through

promotion of investment in order to create a financial system that is strong and stable (Madichie, Maduka, Oguanobi, & Ekesiobi, 2014; Meierrieks, 2014). Other factors that contribute to financial stability and economic growth include mobilization of savings, boosting of the foreign exchange, funding of viable and profitable business opportunities while avoiding losses and spreading risk (Phan, Iyke, Sharma & Affandi, 2020).

WOCCU is the global apex association for credit unions and other financial cooperatives. It advocates for their sustainability and development by empowering savers to access affordable financial services (WOCCU Statistical Report, 2023). WOCCU enhances growth and strengthens credit union movement in the global system through technical assistance, training and tools for management. According to WOCCU Report (2023), there were 74,634 credit unions globally in 2023 serving over 411 million members. The credit unions were spread out in 104 countries of 6 continents and controlled total assets worth over USD 3.7 trillion with a penetration rate of 13.5 percent. The report also shows that more men than women were engaged in credit unions, with fifty two percent being men, forty seven percent women and two percent being groups taking active participation. WOCCU Report (2020) reveals that credit unions in the globe face a common challenge of liquidity problem, making them fail to honor their members' demands for credit and withdrawal of their deposits. In the USA, agricultural cooperative societies suffer from financial problems substantially resulting from financial stress that is reflected by low return on assets (Pokharel, Regmi, Featherstone & Archer, 2019).

In the Sub-Saharan Africa, cooperative movement has experienced unprecedented growth in popularity as witnessed by increment in membership, asset holding and a penetration of 11.5 percent (Ojiagu, 2022; WOCCU Report, 2023). The movement has increased the supply of financial services in the continent, which has contributed in the fight against poverty (Seudib & Amadu, 2020). In the year 2023, over twenty-five thousand credit unions were operating in Africa, spreading in twenty-four countries and serving over forty million members. The credit unions controlled total assets worth over USD 8.6 billion in 2023 (WOCCU Report, 2023). Many cooperative societies in Africa are mostly agriculture based or offer financial services, with prevalence depending on the particular structure of a national economy (Omondi, Omagwa, Ndegwa, & Jagongo, 2024). Agricultural cooperative societies generally represent forty to sixty per cent of all cooperative societies within a given country, whereas those that offer financial services represent thirty to fifty per cent of the cooperative movements in a given country (Sultana, 2022).

The financial health of many SACCOs in the sub-Saharan Africa is not impressive (Kyazze, Nkote, Wakaisuka, 2020; WOCCU, 2020). The problem is similar to those SACCOs across the globe, with low profitability ratios (Safiyuddin, Wahab & Maamor, 2021). The cooperatives are faced with challenges of balancing between management of liquidity, maintenance of adequate capital levels, while at the same time ensuring that their members continued financial demands are fulfilled (Chebet, Nyangau, & Akuku, 2024). Other cooperatives encounter various drawbacks, namely; inadequacy in capital, poor governance and managerial inadequacies (Mmari, & Thinyane, 2019; Mmari, 2019). This has majorly been contributed by the multiplier model based on members'

savings, making these cooperatives financially strained which led to their dissolution (Gichuhi & Makori, 2023).

In East Africa, SACCOs face similar financial health challenges to those faced by their peers in the globe. The challenges include competition from commercial banks, high loan defaults, appalling financial management, poor governance practices, high operational costs, and technological infrastructure that is underdeveloped (Gikunju, 2023). In Rwanda, the government has made significant initiatives to support the cooperative movement that experiences poor profitability due to poor governance and non-compliance of prudential regulation (Murorimana, Uwonkunda, Uwiringiyimana, 2023). In Ethiopia, SACCOs have weak profit generating capacity as most of them allocate much of their financial assets in less rewarding or gainful assets, making them unsustainable (Yitayaw, 2020). In Tanzania, SACCOs have low efficiency and low profitability due to bad governance, insufficient working capital, high levels of NPLs and poor business methods (Mbegu, Magali & Kara, 2024). In Uganda, performance of SACCOs has continued to deteriorate in spite of the government making enormous effort to enhance their governance and management competency (Kule *et al.*, 2020).

Kenya has the strongest cooperative movement in Africa, with total assets worth over USD 6.1 billion and a penetration of 20.7 percent, while globally, Kenya's cooperative movement is rated tenth (WOCCU report, 2023; SASRA report, 2021). The intermediation and implementation of economic policies laid down by the Kenya government have promoted the provision of formal financial services as well as financial deepening where SACCOs reach out to many people in many localities that

are seemingly unattractive to commercial banks. These include areas in the country side that are less economically developed such as rural areas and poor regions (Olando, Jagongo & Mbewa, 2013). The Kenya's Vision 2030 which is the country's national development blueprint recognises SACCOs as one of the major participants in the financial deepening of the household economies for both investments and self-improvement (SASRA, 2013). With regard to the economic development and in the realisation of the global millennium goals, Kenya's Vision 2030 focuses on converting the country into a middle level industrialized economy, with SACCOs included as key players.

DT SACCOs in Kenya have faced challenges emanating from unremitted funds from employers meant for loan repayment and credit facilities which threaten their financial health (SASRA Report, 2023). Some DT SACCOs have fallen into financial challenges following poor expansion decisions of investing in controversial projects, resulting in significant financial losses (Barasa, Musiega & Mungai, 2023). Besides, the use of models that are vulnerable to liquidity hazards, coupled with poor financial management practices have culminated into low liquidity ratios which have affected the SACCOs' financial health (SASRA Report, 2020; Matianyi & Ndirangu, 2019). DT SACCOs have also been found to avoid the utilization of financial innovation due to fear of related technological risk which hinders the generation of higher returns and affecting their financial health (Mokaya, Juma, & Nyatete, 2023). Besides, DT SACCOs in Kenya have been found to experience weak governance structures, with distinguishing insufficient oversight and poor leadership. This has contributed to their

financial under-performance (Riro, Gatheru, & Mutiso, 2020; Nyongesa & Jagongo, 2023).

1.1.1 Financial Health

The financial sector in Kenya is dominated by three main players namely; commercial banks, SACCOs and micro finance institutions. SASRA report (2022) shows that commercial bank dominated the deposit taking institutions with total assets of Kshs 6.59 trillion in 2022 followed by the regulated SACCOs at Kshs 890.30 billion while the microfinance banks' total assets stood at Kshs 70.43 billion. The customer deposits in commercial banks stood at Kshs 4,761.70 billion compared to the regulated SACCOs whose members' deposits stood at Kshs 620.45 billion, while those of microfinance institutions stood at Kshs 46.49 billion in 2022. In the gross loans and advances front, commercial bank institutions led with Kshs 3,630.25 billion, followed by regulated SACCOs with Kshs 680.35 billion, while microfinance banks stood at Kshs 39.33 billion (SASRA report, 2022). Notably, unlike commercial banks and MFBs, regulated SACCOs' loans and advances outweighed the deposits, an indication that SACCOs are the preferred loaning institutions by savers due to their competitive rates and social collateral/guarantee model (SASRA Report, 2023).

According to SASRA report (2022), commercial banks have the largest share of the deposit-taking financial institutions in terms of total assets, with a proportion of 87.28 percent in 2022 and 87.24 percent in 2021. The MFBs controlled the least amount and proportion of total assets held by the financial institutions in 2022. This was at 0.93 percent and 1.07 percent reported in 2021 and 2022 respectively. On the credit front,

regulated SACCOs' gross loans accounted for 15.60 percent of the gross loans issued in 2022 and 15.54 percent in 2021 by all the deposit-taking financial institutions in Kenya. The commercial banking sector remained the most dominant in the credit provisioning with a market share of 83.25 percent in 2022 and 83.09 percent in 2021; while the MFBs remained the least dominant with a market share of 1.15 percent in 2022 and 1.38 percent in 2021. On the deposits front, the regulated SACCOs market share stood at 11.43 percent in 2022 compared to 11.15 percent in 2021. The market share for the commercial banks stood at 87.71 percent in 2022 (SASRA Report, 2022).

Every organization should ensure that it maintains a strong and consistent financial health trend by setting out SMART strategies that ensure the business engages in ethical activities that generate enough revenue to support its longevity (Umukoro *et al.*, 2020). Management should consistently observe the financial health of their organization to identify whether or not the organisations are experiencing grievous financial problems that require timely remedial action (Nyakieni, 2022; Hazwan, 2020; Zheng, Siddik, Masukujjaman & Fatema, 2021). Identified problems should then be solved in a timely and effective way (Srivastava, 2023). With complex and volatile environment that the financial sector operates in, management should apply effective strategic risk management to ensure the maintenance of financial stability and regulatory compliance of their financial institutions (Priyanti, Zunaidi, & Maghfiroh, 2022). Moreover, management should encompass the process of identification, evaluation, and mitigation that expose their strategic objectives to potential risks that can have negative effect on financial health of their firms (Adejugbe, 2021).

Financial health assesses the effectiveness of an organization in the exploitation of its operating assets at its disposal in the process of producing returns, measured over a period of time (Gikongo, 2021). Financial health indicates the achievements made by an organization in an operational period compared to the predetermined targets, standards and criteria (Afrizal, 2018). According to Teguh Maianto, Zulaekah, Mulyani & Arif (2024), financial health indicates whether an organisation is achieving its ultimate goal of maximising its shareholders' wealth or not. Financial health is therefore a prime indicator of financial performance, a measurement tool and a landmark for reference for every stakeholder (Umukoro *et al.*, 2020; Nwanji, Howell, Faye, Otekunrin, Eluyela, Lawal & Eze, 2020). Financial health of DT SACCOs is therefore an underlying factor due to its contribution in the growth and stability of the economy and promotion of the society's welfare through different market segments (Sonar & Kishorjagad, 2022).

Teimet, Lishenga, Mwangi and Ochieng (2021) advocate for the adoption of three approaches in measuring of financial health, namely; the economic value-added model, the market-based model as well as the traditional model. The economic value-added approach uses the opportunity cost as a measure of shareholders holding, while taking into consideration the shareholder's equity and cost of capital. The approach seeks to create economic value by increasing the shareholders' capital as well as maximization of shareholders wealth (Tripathi, Varun, Umesh, Rahul, & Vinay, 2023). The market-based model indicators involve market ratios that include P/E ratio, market to book ratio, cash flow per share among others, which reflects how efficiently a business performs in consideration to the share price and other related items (Myšková & Hájek, 2017). In the traditional approach, financial health is indicated using ROA, ROE, ROCE

and NIM. Considering the three approaches, the study found the traditional approach to be the most appropriate measure of financial health due to its relevance in the study.

ROA and ROE are the two main measures of financial health in the traditional approach due to their relevance and adoptability by many studies. The two measures indicate the organizational rate of utilization of asset in the generation of revenue (Muhammad & Sandeep, 2022). However, ROE exhibits several shortcomings exhibited by its short-term internal measure that depends on the availed managerial incentives. Management can control ROE through financing decisions such as alteration of depreciation rate or increasing the project life, that impacts on profit when calculating the shareholders' equity (Liu, Lin, Sun, & Yuan, 2021). Such practices can conceal many problems in financial health as organizations can fall back to fictitious financial strategies so as to maintain a healthy ROE, while concealing the deteriorating performance of the business principles (Pennacchi & Santos, 2021). Additionally, Athanasoglou, Brissimis and Delis (2008) found ROE to be an inappropriate indicator for shareholder's wealth in both accounting and finance studies. Besides, a financial institution's ROE is a subset of its respective ROA (Harutyunyan, 2024).

ROA assesses the rate of assets utilization and resource transformation in the process of income generation (Hertina, Pardedeand & Yesenia, 2021; Akinleye & Adesina, 2019; Jahan, 2020). It discloses the effectiveness of an entity in harnessing business opportunities in a highly uncertain environment over a period of time. This qualifies it as a seasoned and central measure for evaluating income on equity and operating profit (Jahan, 2020). ROA has also been found to be a perfect, effective, and broadly available

financial health measure that apprehends the foundations of business performance in a comprehensive way (Wondmagegn, Habtamu & Mekonnen, 2021; Derbali, 2021; Almehdawe, Khan, Lamsal, Poirier & Angele, 2020). Most financial literature has generally adopted ROA in the measurement of financial health, thereby making it the most common indicator. A higher ROA indicates a higher effectiveness in resources utilization and transformation, while a prolonged ROA path pronounces sustainability of the prevailing financial health (Singh, Gupta & Chaudhary, 2024).

Understanding ROA trajectory provides a foundation of the long-term perspective that helps entities shape their winning strategies through planning and forecasting (Lassala-Navarré, Kalveram & Sapena Bolufer 2017). ROA not only shows the profit earned by the assets under control, but it also reflects the management's ability to utilize the invested resources in the production of higher profits (Pandey, Diaz & Yuan, 2019). According to Kimutai, Jagongo, and Omagwa (2019), DT SACCO segment in Kenya is inefficient and does not optimise the utilisation of resources in its disposal in the production of output. The study found that small DT SACCOs are yet to achieve economies of scale while the large DT SACCOs suffer from diseconomies of scale. This pronouncement points to the problem in utilisation of resources in the process of generating revenue. ROA will be measured by dividing EBIT by total assets. Some of the studies that measured financial health using ROA include Pokharel, Regmi, Featherstone and Archer (2019), Almehdawe, Khan, Lamsal, Poirier and Angele (2020), Teimet *et al*, (2021) and Fadhillah, Nadiyah, Rohmah, Haryadi, & Wahyudi (2024). The current study therefore used ROA to measure of financial health.

SASRA report (2022) shows that the DT SACCO segment had issued total gross loan of Kshs 586.16 billion as compared to Kshs522.25 advanced in 2021. 154 DT SACCOs registered positive growth rates in their gross loan portfolios while the remaining 22-DT-SACCOs registered negative growths rates in their respective gross loan portfolios. On the other hand, 100 DT SACCOs recorded cumulative gross loans of Kshs 59.43 billion, recording positive growth rates of above 10 percent. On the other hand, 33 DT SACCOs recorded positive growth rates of between 5 percent and 10 percent with a cumulative value of Kshs5.70 billion, while the remaining 19 DT SACCOs recorded positive growth rates of below 5 percent with a cumulative deviation sum of Kshs 0.41 billion. However, 7 DT SACCOs recorded negative growth rates above 10 percent in their individual gross loan portfolios, while 5 DT SACCOs recorded a negative growth rate of between 5 percent and 10 percent. The remaining 10 DT SACCOs recorded individual negative growth rates of below 5 percent. SASRA report (2022), the DT SACCO segment recorded an increase in the non-performing loans from Kshs 46.27 billion in 2021 to Kshs 49.24 billion in 2022.

1.1.2 Prudential Regulation

Prudential regulation has attracted much attention from policy formulators and academic circles due to its influence on the stability of financial institutions and subsequently the entire financial system (Balasubramanyan, Naveen, Haubrich & Naveen, 2023). A country's economic growth is majorly grounded on the prudential regulation of its financial institutions due to the influence of such regulation on the financial system (Kirimi, Kariuki & Ocharo, 2021). Prudential regulation has profound and far-reaching impact on the banking industry, spreading through every aspect of

financial institution's operations and decision-making (Ma & Vadasz, 2024). Financial stability of the financial system is a key determinant of social and economic development because it stabilises the financial sector, making it a pre-requisite for economic growth and resilience to potential financial crisis (Ali & Puaah, 2018; Musabi & Mbithi, 2018). Poor regulation can result in financial instability that can threaten and cause losses to an economy through operating mechanisms of the financial system. This can trigger financial crisis, devastate and destabilise an economy (Sparatt & Stephen, 2013; Gupta & Kashiramka, 2020).

When the set regulations are observed and maintained, they prepare financial institutions in the mitigation of disturbances that cause financial shocks and financial crisis by developing stability and resilience. This is because regulators ensure such regulations instill discipline and accountability (Curi & Lozano-Vivas, 2020; Khamusali & Theuri, 2024). Besides, they foster financial inclusion, which contribute to the evolution of both the banking business models and service delivery channels that enhance consumer protection (Savona, 2022). Regulators therefore enable financial institutions to manage potential risk by setting risk exposure limits and robust internal controls that absorb potential such losses through maintenance of solvency and resilience (Yawen, 2022; Chronopoulos, John & Yilmaz, 2023). A stable financial system promotes the economic growth of a country (Raouf & Ahmed, 2020; Kirimi, Kariuki, Ocharo 2021; Shkodra, Anastasiou & Kallandranis, 2024).

A financial system that is stable has been found to efficiently allocate resources which lowers intermediation costs and the level of information asymmetry (Ji, Tang & Shao, 2022; Yuksel, Ayfer, Metin, Mehmet & Esme, 2023; Amali, Igwe, & Oballum, 2022). Besides it builds on the capability of offering diversified financial products and services which subsequently promotes financial inclusion and advancement of relatively cheaper loans that minimises the odds of bank panic and cash crunch that could lead to solvency (Musau, Muathe, & Mwangi, 2018; Nemer, 2024; Okong'o & Nyaga, 2023; Yawen, 2022). This bleeds confidence among customers because it assures the safety of their investment (Oko-Odion & Omogbeme, 2025; Raouf & Ahmed, 2020). Unstable financial institutions can destabilise the financial system which can cause devastation and destabilisation of an economy thereby triggering a financial crisis (Gupta & Kashiramka, 2020; Hwang, 2022).

Prudential regulation minimises moral hazard and protects the erosion of deposits losses, thereby promoting higher financial intermediation (Kim & Jiwook, 2024). Besides enabling financial institutions to operate smoothly through a multitude of financial infrastructure, prudential regulation prevents the cascading effect that could destabilise the entire financial system by minimising the level of financial risk exposure. This ensures that the financial institutions are safe and sound (Lotter & Okoro, 2024; Biondi & Graeff, 2024). Regulation therefore ensures of consumer protection by taking a different direction from credit control over interest rates (Muriithi, Nasieku & Memba 2022; Kiplangat, 2020; Hussain, Musa, & Omran, 2019). It minimises losses and spreads risks while observing the performance of managers (Phan, Iyke, Sharma & Affandi, 2020; Bognár, Balázs, & Petra, 2023). Additionally, it

empowers the allocation of capital functions from savings to investment activities that supports sustainability of payments in the long run (Gulaliyev, Ashurbayli-Huseynova, Gubadova, Ahmedov, Mammadova & Jafarova, 2019). This stimulates investment and creates a strong and stable financial system (Antwi, Kong & Gyimah, 2024; Kristalina, 2021).

The functional responsibility of formulating and supervising prudential regulation in financial institutions is allocated to central banks and other appointed authorities (Nout, 2023; Bognár, Szentes, & Petra, 2023). The regulatory bodies adopt risk-based approaches to regulation and make use of modern diagnostics and innovation that consider the operations of financial institutions to uncover emerging risks in a timely manner (Karem and Azzahra, 2024). Standard prudential regulation is therefore necessary because under-regulation or little regulation culminates in mismanagement and corruption, which can collapse a financial system (Wiley & Navickas, 2021). DT SACCOs in Kenya are regulated by SASRA which adopted the CAMELS framework to ensure that the SACCOs remain financially stable for sustainability and protection of members' funds. The framework standardises, assesses and monitors the SACCOs' financial stability and enhances transparency and accountability of SACCO management (Mohamed, Akims, Nyachae & Mbugua, 2023). The set regulations should therefore be adhered to in order to remain stable and ensure that the segment remains stable. The Sacco Societies Act of 2008 requires all DT SACCOs to observe three main regulatory requirements that include; asset quality, capital adequacy and liquidity.

The level of asset quality relates to the quality of loan book in a financial institution and points to efficiency in servicing of loans by borrowers (Wanjagi, Nasieku & Olanrewaju, 2024). Asset quality indicates the performance of loan portfolio (or book loan) that has been dispatched to borrowers. Deterioration of asset quality is detrimental to the stability of a financial institution and the financial system as a whole (Kuria, Kiboi & Macheru, 2024). Each loan is categorised into either performing, watch, substandard, doubtful or loss category. Each category is allocated a specific rate of provision of loan loss to cater for failure of collecting defaulted loan (Mohamed, Wepukhulu, & Otinga, 2023). Non-performing loans form one of the riskiest categories of items in the balance sheets of financial institutions and are unwanted by-product that cause “financial pollution” of the performing loans, with adverse effect on asset quality (Vyshnevskiy & Sohn 2023). According to Mande, Salisu, Adeola, Dosumu, and Adamu (2020), high level of NPLs is detrimental to income growth because the loans component forms the highest proportion of SACCOs total assets, making it the most significant and biggest source of SACCO revenue. Increase in NPLs therefore denies profits to SACCOs and exposes them to both credit and liquidity risk that can trigger their instability and fragility (Koskei, 2020).

According to SASRA report (2022), seventy-two DT SACCOs had their individual NPL ratios complied with the recommended threshold where thirty-two had their NPL ratio below two percent, forty-two had their NPL ratios between 5 percent and 10 percent while sixty-two had their NPL ratios above the 10 percent threshold. The overall mean NPL ratio of the DT SACCO segment was 8.40 percent in 2022. The Sacco Societies Act of 2008 requires all DT SACCOs to maintain portfolio at risk

(PAR) of not more than 5 percent to ensure a healthy loan portfolio. A lower portfolio at risk ratio translates into higher revenue and hence higher surplus due to the factoring in of the provision for loan loss (Gurung, Ghimire, & Dahal, 2023). DT SACCOs should therefore ensure that they comply with the set asset quality regulatory requirement by attaining and maintain the set ratios. Asset quality is related to credit risk because when a borrower defaults in loan repayment, it culminates into credit risk (Wanjagi *et al.*, 2024). According to Kimutai *et al.*, (2019), increase in NPLs in DT SACCOs is contributed by inefficiency in the segment. Asset quality will be measured by dividing the non-performing loans by the total gross loans to get the portfolio at risk ratio.

Capital adequacy concept originates from the Basel I accord that defined capital adequacy in terms of the minimum requirement and measured by capital-to-assets ratios. The accord was initially formulated for banks in the US and UK, but was subsequently adopted by banks worldwide (Hunjra, Zureigat, Mehmood, 2020). Basel II accord set the objectives that improved the alignment of risk with their required regulatory capital that better reflected the sophistication and complexity of bank operations. The accord was built on three pillars of minimum capital requirements, supervisory oversight on behalf of national regulators and stronger market discipline in the form of information disclosure on capital, risk exposures, and risk assessment processes (Donatou & Leventides, 2022). Basel III accord improved on the quantity and quality of capital and addressed the weaknesses of existing capital regulations and profitability improvement in banks (Obadire, Vusani & Ntungufhadzeni, 2022; Mdandalaza & Jeke, 2025). It reinforced bank regulation and targeted reduction of the

magnitude of possible financial crises by creating a solid banking culture particularly where the management of risk was underpinned by prudent and consistent accounting practices (Fidrmuc & Lind, 2020). It also expanded capital adequacy ratio that increased assurance to the financial sector and ensured safe, sound and stable financial systems (Aysa & Razali, 2020; Kilonzo & Atheru, 2024).

Capital adequacy cushions financial institutions against potential losses and helps them to absorb economic shocks and avoid financial crises (Kiemo, Talam & Rugiri, 2022; Abbas & Younas, 2021; Gupta & Kashiramka, 2020). The capital adequacy ratio reflects the financial stability and strength of a financial institution and how well it is prepared to withstand both irregular and operational losses (Gathara, Mutwiri, & Aluoch, 2023). When capital adequacy falls below the prudential threshold, instability creeps in that puts financial institutions under pressure from shocks (Hassan, Unsal, & Tamer, 2016). According to Kivuvo and Olweny (2014), capital adequacy buffers financial institutions against potential losses which can affect their financial health. Financial institutions should therefore increase their capital adequacy ratio above the minimum threshold to eradicate inherent risks associated with bank operations such as the moral hazard that is instigated by government guarantees and implied too-big-to-fail subsidies (Admati & Hellwig, 2013). Well capitalized financial institutions have been found to extend more loans and advances to their customers, thereby generating more revenue than those that are poorly capitalized (Teshome, Debela & Sultan, 2018).

DT SACCO in Kenya must have a minimum core capital of not less than ten million Kenya shillings, which should be maintained throughout the life of the institution. Other capital adequacy ratios that should strictly be observed are the core capital to total assets ratio which should always be above ten percent and the core capital to total deposits which should not go below 8 percent. The institutional capital to total assets ratio should always be maintained at or above 8 percent. SASRA report (2022) shows that 144 DT SACCOs fully complied with the core capital to total assets ratio by 2022 compared to 154 DT SACCOs which were fully compliant in 2021. SASRA report (2022) shows 20 DT SACCOs grew their assets at faster rates than their core capital, which saw their core capital to total assets ratio fall between 5 percent and 10 percent in 2022. The number of SACCOs with the same ratios stood at 11 SACCOs in 2021. These SACCOs require increasing the rates at which they retain their surpluses in order to boost their ratios. However, 12 DT SACCOs were reported to be non-compliant with the core capital ratio and were thus operating on strict conditional or restricted deposit-taking licenses. On the other hand, 144 DT SACCOs were fully compliant with the institutional capital to total assets ratio in 2022, an increase from the 125 DT-SACCOs which were fully compliant with the ratio in 2021.

DT SACCOs should make adequate retention from their surpluses for purposes of building their capital which boosts their stability (SASRA report, 2022). The core capital of DT SACCO segment grew from Ksh109.29 billion in 2021 to Ksh124.89 billion. In the same period, the institutional capital to total assets ratio grew to 9.58 percent from 9.15 percent in 2021 (SASRA report, 2022). The core capital to total assets ratio increased to 16.36 percent in 2022 from 15.81 percent in 2021 against the

prescribed minimum ratio of 10 percent. The core capital to total deposits ratio also increased from 23.05 percent in 2021 to 23.90 percent reported in 2022. The report shows that in the year 2022, 168 DT SACCOs were able to maintain their core capital above the minimum requirement of Ksh10 million, while 8 DT SACCOs had their core capital below the prescribed threshold. Again, 168 DT SACCOs were able to meet the prescribed minimum core capital to total deposits ratio in 2022 against 163 DT SACCOs in 2021. Only 1 DT SACCO did not maintain the prescribed minimum but was still within the allowable threshold of over 50 percent of the prescribed minimum. 7 DT SACCOs were below the allowable threshold of fifty percent of the prescribed minimum.

Liquidity refers to the liquid assets that are available for honoring the institution's financial obligations of new loans disbursements, members' withdrawals and other operational expenditure. It is a pointer to an organisation's preparedness in executing its short-term obligations (Klaas & Vagizova, 2014; Wanjiru & Waweru, 2025). Liquidity assesses the financial well-being of a financial institution, indicating its capacity to fulfill its financial obligations promptly (Njue, Kariuki & Njeru, 2020). Regulatory guidelines by Basel III framework places more significance on management of funding of liquidity in financial institutions and creation of liquidity in the economy. Stability of financial institutions is therefore influenced by liquidity, and calls policymakers and management to understand the role played by liquidity in strengthening their institutions (Habib, Khan & Meyer, 2022). Liquidity includes liquid assets held either in the institution or invested in other financial institutions that are in convertible state in readiness to respond to unprecedented members' demands or other financial

obligations. Liquidity therefore provides a consistent source of readily available liquid assets and serves as a valuable metric for assessing the financial viability of prospective investments (Ward, 2021).

Failure by a financial institution to honor its financial obligations expeditiously over a specific period of time can lead to solvency (Muriithi & Wareru 2017; Sathyamoorthi, Mapharing & Dzimiri, 2020). Financial institutions should therefore remain liquid enough to avoid situations that can trigger financial crises, forcing them to cease significant operations which pose threats to members' deposits (Li, 2019; Flögel & Gärtner, 2020). This is because depositors have a right to withdraw their savings and to receive new loans for their personal expenses and/or alternative investments (Gweyi, 2018). Illiquidity can trigger liquidity risk that can spark a bank run, rendering an institution fragile, and if not well controlled, it can lead to solvency (Cytonn, 2018). Since DT SACCOs' activities are cash-based operations, management should prudently manage their liquidity levels by ensuring that they are always prepared to meet members' unanticipated demands. To manage liquidity risk, DT SACCOs are required to maintain a liquidity of not less than 15 percent of the members' deposits and short-term liabilities in liquid assets (SACCO Societies Act of 2008). Illiquidity results in trapping of funds in a financial system, which leads to conversion of non-cash funds due to high loan defaults, poor credit risk management, sudden large withdrawals, and economic fluctuations (Hao & Wong, 2021).

SASRA report (2022) shows that out of the 176 DT SACCOs operating in Kenya in 2022, 170 maintained liquidity ratios above the required minimum of 15 percent, with the remaining 7 DT SACCOs having a liquidity ratio of between 5 percent and 15 percent (SASRA, 2021). According to SASRA report (2022), the overall DT SACCOs statutory liquidity ratio stood at 64.72 percent as compared to 55.34 percent in 2021. The report shows that 170 DT SACCOs were fully compliant with their liquidity ratio standing well above the prescribed minimum of 15 percent in 2022. However, the report implies that most of the SACCOs were holding a lot of liquid assets in idle state. The remaining 6 DT SACCOs operated with their liquidity ratios below the prescribed threshold, although 3 had their liquidity ratio ranging within the allowable deviation ratio of between 7.5 percent and 15 percent.

1.1.3 Technical Efficiency

The study modeled technical efficiency as a moderating variable, a third variable that could act on the relationship between the dependent and the independent variable thereby changing the strength or the direction of the relationship between the variables (Pokhariyal, 2019; Söderlund, 2023). A moderating variable affects zero-order correlation and assesses the relationship between the independent and independent variables as to whether it is strong, weak or otherwise inconsistent (Hayes, 2015). The concept of technical efficiency is important in the study because it fosters competitiveness, which is important for economic development of a country (Osmani & Andoni, 2022). Only a strong technically efficient and profitable financial institution can promise a realistic return to its stakeholders and minimise the chance of bankruptcy (Adusei & McMillan, 2016). Though there is no financial institution that can be referred

as technically efficient, technical efficiency is evaluated by the level of input-output analysis (Teimet *et al*, 2020).

Technical efficiency is defined by the optimal aggregate of inputs to given outputs with the least possible quantity of inputs (Bondarenko, Kutnyashenko, Rudyk, & Solyonyj, 2019; Amare, Demissie, & Massa, 2025). Organisations should operate efficiently for growth and long-term sustainability (Ayush Singh, 2024; Chen, You & Chang, 2021; Păunescu & Argatu, 2020). Cost-savings should not compromise the quality of financial services, which may not be desirable as they definitely affect performance (Yeung, 2024; Abdmoulah, 2021). Researchers are of the view that there may be a trade-off between soundness and efficiency in certain circumstances (Olivier, Bora, Hibiki, Yasin, Jolan, Kalin, Sigrid, Jean-Guillaume, Valerio & Straughani, 2024). Although there is no clear and unambiguous relationship between efficiency and stability, a more efficient financial system has been associated with greater financial stability (Michel, Krzystof, Thiago & Francisco, 2022). Financial distress and crises can inherently cause inefficiency due to operations falling below capacity because the survival of any business depends on its competitive environment (Kanoujiya & Rastogi, 2024; Srivastava, Singh & Jain, 2023).

Technical efficiency occurs when production is at its maximum (Meshesha, Wondaferahu & Malebo, 2025). Technical efficiency helps in solving information asymmetry problem as well as mitigating possible economic fluctuations (Novickyte & Drozd, 2018). In the financial sector, technical efficiency is achieved when the smallest possible set of inputs is utilised to produce the highest possible and best

combination of outputs. Technical efficiency is recognised as the main actor in the overall financial development of any emerging economy because it enhances resilience against shocks because it ensures that business operates with minimum wastage, with optimal transition of inputs into outputs (Zaki & Khan & Burki, 2024; Gizaw, Getachew & Mancha, 2024; Shahbaz, Nasir & Lahiani, 2021; Taher & Bashar, 2024). It is therefore paramount to evaluate business technical efficiency in order to assess their business continuity (Gupta, Tuunanen, Kar & Modgil, 2023). An existing technology can determine an organization's technical efficiency (Guisado-Gonzalez, Gonzalez-Blanco & Rodriguez-Dominguez, 2024).

Technical efficiency indicate how well financial intermediation process is being carried out, reflecting the realistic return a financial institution is promising to its stakeholders and the chance of bankruptcy (Amayehu & Belete, 2019; Ntwiga, 2020). There are two broad frontiers that are applied to represent efficiency, namely; the parametric model and the non-parametric model. The former is an economic model where pre-definition of some parameters prior to utilizing them in forecasting is a requisite (Mahajan et al. 2020; Wang *et al.* 2021; & Wijesiri *et al.* 2019). DEA method is widely used to measure technical efficiency because it allocates a set of desirable properties that an ideal efficiency measure should meet (Uddin, Akhtar, Qamar, 2025; Ebrahimi, 2020; Mohamed & Ezzeddine, 2021). Technical inefficiency for each DMU is the deviation from the evaluated DMU to the frontier of the production possibility set, which represents the reference benchmark (Aparicio, Monge & Ramón, 2021). An efficient financial institution is capable of mobilising savings and provide loans to members at a

faster rate with reduced unnecessary expenditures in the intermediation process (Rejekiingsih, Kurnia & Sugiyanto, 2022).

Technical efficiency is measured as a weighted sum of outputs divided by a weighted sum of inputs where DEA was used because it does not need a pre-defined functional form, making it less inclined to model weaknesses, and not vulnerable to the exposure of distribution assumptions about the error term (Touqeer, Masood, Muhammad, Muhammad, 2011; Issavi, Tari, Ansari & Amozad, 2018). The data points in the DEA models are distributed in a way that every single point is found to lie either above or below the production frontier, making it appropriate in the estimation of production frontiers, which is based on envelopment techniques (Pascoe, Cannard, Dowling, Dichmont, Asche & Little, 2023). DEA has also a significant role for determining technical efficiency due to its flexibility in confronting multiple inputs and outputs and its non-parametric nature. This ultimately measures the relative efficiency of a set of observations or decision-making units (DMUs) when the process presents a structure of multiple inputs and outputs and their performance is compared with respect to the frontier of a production possibility set (Aparicio, Monge & Ramón, 2021). Some of the studies that used DEA to measure technical efficiency include Khan (2016); Nguyen (2017); Sharma (2018); Kimutai *et al.*, (2019); Desheng, Shah & Korotkov (2019); and Teimet *et al.*, (2021).

Intermediation process reflects how efficiently SACCOs mobilize savings from members, provide loans, and how they recover loans at minimum costs (Marwa & Aziakpono, 2014). SACCOs should be efficient in their day-to-day operations to

generate interest on members' deposits and dividends on shares. Kimutai *et al.*, (2019) found that DT SACCOs are yet to attain efficiency as large DT SACCOs suffer from diseconomies of scale while small DT SACCOs are yet to achieve economies of scale. Inefficiency slows down the growth of DT SACCOs which in turn negatively affects the society's welfare (Muriithi, Nasieku & Memba, 2022). Five inputs that were used in the study namely; deposits, labor, operating expenses, interest on deposits, and interest on share capital. On the other hand, there were three outputs that were used namely; loans, interest income, and other incomes. To calculate the weighted inputs, the proportion of each value of input was divided by total input and then multiplied by the value the input. The results of each input were added up to get the weighted inputs. To calculate the weighted output value, each output was divided by total output then multiplied by the value of the total output. Again, results of each input were added up to get the weighted inputs.

1.1.4 DT SACCOs in Kenya

Kenya has the strongest cooperative movement in Africa, with total assets worth USD13.6 billion, with SASRA rating Kenya's cooperative movement tenth globally (WOCCU report, 2021; SASRA report, 2021). DT SACCOs provide formal financial services, reaching out to many people in various localities that are seemingly unattractive to commercial banks (Olando, Jagongo & Mbewa, 2013). The vibrant and rapid growth in the SACCO sector makes the sector a key driver in Kenya's financial sector landscape (SASRA Report, 2023). This is manifested where the SACCO sector continues to play its rightful role in the economy through marshalling savings and subsequently facilitating loans to many household economies (SASRA Report, 2022).

The sector has empowered the less financially able people who cannot qualify for loans from commercial banks access formal financial services, making the sector's impact in the Kenya economic development indispensable (Gichuhi & Makori, 2023). The role of SACCOs as economic development partners through their financial deepening role has mobilised savings and advancement of loans to members for investment, which has lifted individual financial growth and the society welfare as well (Ochola, 2016; SASRA, 2020).

Kenya's Vision 2030, the country's national development blueprint, recognizes SACCOs as one of the major participants in the financial deepening of the household economy for both investments and self-improvement (Ngundo, 2024). DT SACCOs contribute to the economic development and in the realization of the global millennium goals that focuses on converting the country into a middle level industrialized economy (Masibili, Ochieng & Ochieng, 2021). SACCOs played an important part in supporting the Big Four Agenda through provision of finance in form of credit to agriculture, housing, health care, manufacturing and job creation in the MSMEs. Thus, the financial health of SACCOs is important as it influences the performance of the entire financial sector. The financial performance at which SACCOs is of interest to stake holders as it translates into wealth maximization which in turn encourages investment (Gogo & Oluoch, 2017).

The responsibility of the SACCO sector is principally holed within the financial services sector plan of the Economic Pillar of the Kenya Vision 2030 (SASRA report, 2022). The role of SACCOs is recognized in the implementation of the First to Fourth Medium Term Plan (MTP I-IV). In the Financial Services Sector Plan 2008-2027,

SACCOs are reflected as a key component of the country's national financial sector, and vehicles for economic transformation through financial inclusion, mobilization of deposits and advancement of credit facilities (Masibili, Ochieng & Ochieng, 2021). There is no doubt that when the final evaluation of the Kenya Vision 2030 Third Medium Term Plan (MTP III, 2018-2022) is finally written, the overall contribution of SACCOs shall be very well pronounced (SASRA, 2021). The Fourth Medium Term Plan (MTP-IV: 2023-2027) of Kenya Vision 2030 seeks to implement the fourth and last phase of Kenya Vision 2030 and sets the momentum for transition to the next long term development agenda for the country beyond 2030. MTP-IV is guided by the lessons learnt in implementation of the previous MTP-I, MTP-II and MTP-III; the Constitution of Kenya 2010, and the incorporation the governments' key priorities outlined in the government's Bottom-Up Economic Transformation Agenda (SASRA Report, 2023).

The regulated SACCO subsector plays an important role in the economic development of the country by serving a large household economy, especially those in the lower echelons of the economic pyramid (SASRA report, 2022). The regulated SACCO subsector significance can be felt in its contribution towards the improvement of the social well-being of the citizens (Kabaiku, 2018). The subsector contributed 6.66 percent to the national gross domestic product in 2022, same as 2021, measured on the basis of the total assets controlled by the regulated SACCOs to the nominal GDP (SASRA report, 2023). The DT-SACCOs segmental total assets to the national GDP was 5.71 percent in 2022, compared to 5.75 percent recorded in 2021. This indicates that, the regulated SACCOs are quite significant to the economic growth of the country

and also cements their critical role in the national development space in Kenya's economic growth. In 2022, regulated SACCOs in Kenya had a total of 6.42 million active members, besides providing employment opportunities to eleven thousand, one hundred and eighty-eight Kenyans (SASRA, 2022).

Many regulated SACCOs have risen from being rural-based financial institutions to organizations with asset base translating into millions or even billions of Kenya shillings (Gikunju, 2023). The total assets' portfolio of the regulated SACCOs hit Kshs 890.30 billion in 2022 from Kshs 807.30 billion in 2021, making the subsector become the second biggest formal financial service subsector in the Kenya after the commercial banking sector. The SACCO subsector has become the most preferred formal financial service provider in Kenya due to its simplicity in the lending procedure (Birgen, Njau & Magadi, 2023). The bare minimum condition for getting a loan is simple, where a borrower is only required to have made some savings known as non-withdraw-able deposits and backed by guarantors (SASRA Report, 2020). In Kenya, more than five million people derive their incomes through the SACCOs' channeling techniques (Waitherero, Muchina, & Macharia, 2021).

Regulated SACCOs in Kenya comprise of both the deposit taking SACCOs (DT SACCOs) and the non-withdrawable deposit taking SACCOs (NWDT SACCOs (SASRA report, 2022). The distinguishing characteristic between the two is clearly defined in the SACCO Societies Act of 2008 where on one hand; the SACCOs that undertake the deposit taking business are legally allowed to operate accounts in respect of three clusters of deposit liabilities, namely; withdraw-able deposits, fixed term

deposits and non-withdraw-able deposits. On the other hand, the NWDT SACCOs maintain and operate accounts for non-withdraw-able deposits only (SASRA, 2021). Withdraw-able deposits are accessible by members at any time and at will, while the non-withdraw-able deposits are used as loan security or collateral, and are only refundable when a member withdraws from a SACCO membership. SASRA started regulating all the NWDT SACCOs with total members' deposits amounting to one hundred million Kenya shillings and above effective from January, 2021.

DT SACCOs and commercial banks have a common similarity in that they both take deposits and intermediate the same on behalf of their members (SASRA report, 2022). The main difference between the DT SACCOs and the commercial banks is found in the way both are defined in terms of operation and ownership (Mbithi, 2023). First, DT SACCOs are members-owned, where each customer receiving their services must be a member of that SACCO and holding a minimum amount of declared share capital. The SACCO Societies Act prohibits DT SACCOs to transact with non-members while the commercial banks are typically commercial enterprises where their customers are to large extent not necessarily their members. Though commercial banks aim at optimizing their shareholder's wealth, their customers never benefit from such profits (Jepkorir, Muturi, & Ndegwa, 2021). Besides, the two sectors have different regulators where DT SACCOs are regulated by SASRA while commercial banks are regulated by CBK.

The DT SACCOs comprise of members who come from different sectors of the economy. These include government-based DT SACCOs; agriculture related DT SACCOs, community-based DT SACCOs and private based DT SACCOs. In the year

2022, there were 82 government-based DT SACCOs, 49 agriculture related DT SACCOs, 25 community-based DT SACCOs and 20 private based DT SACCOs. These SACCOs provided a broad array of diversified services which promoted a competitive, sound and efficient financial system which contributed to a significant proportion of the country's economic growth. According to SASRA report (2022), the DT-SACCOs segmental total assets to the national GDP was 5.71 percent in 2022, compared to 5.75 percent recorded in 2021. The report also shows that DT SACCOs provided employment to nine thousand eight hundred and seventy-six people, which accounted for 88.27 percent of all employees within the regulated SACCOs subsector. This demonstrates the dominance of the DT-SACCOs segment, when compared to the NWDT-SACCOs segment which employed 1,312 employees during the same period, and accounting for 11.73 percent of all the employees within the regulated SACCO system (SASRA, 2022).

SACCOs' regulatory body SASRA was established in 2010 under the SACCO Societies Act to regulate DT SACCOs in Kenya. The first batch of seven DT SACCOs under the CAMEL regulatory framework was licensed in March 2011. From the year 2012, all the DT SACCOs in Kenya were required to comply with the CAMEL regulatory framework. By the end of year 2012, one hundred and twenty-four DT SACCOs had been licensed under the CAMEL framework (SASRA, 2012). According to SASRA report (2022), there were a total of one hundred and seventy-six DT SACCOs in Kenya in 2022. These were categorized into three tiers namely; the small tiered DT SACCOs, the mid tiered DT SACCOs and the large tiered DT SACCOs. The categorization was based on either the total assets or the total deposits controlled by an individual DT

SACCO. Small tiered DT SACCOs control total assets and/or total deposits below one billion Kenya shillings while mid tiered DT SACCO's controlled total assets and/or total deposits of between one billion Kenya shillings and five billion Kenya shillings. On the other hand, large tiered DT SACCOs controlled total assets and/or total deposits in excess of five billion Kenya shillings (SASRA Report, 2023).

In the year 2022, there were 42 large tiered DT SACCOs as classified according to their total assets (SASRA Report, 2022). At the same time, there were 30 large tiered DT SACCOs, classified in relation to their total deposits. On the other hand, there were 56 mid tiered DT SACCOs classified according to the total assets they controlled. The same classification had 51 DT SACCOs based on the total deposits they controlled. Meanwhile, there were 78 small tiered DT SACCOs classified according to the total assets they held while there were 95 DT SACCOs in the same category based on their total deposits. During this period, the entire DT SACCOs segment controlled Kshs763.5 billion total deposits out of which the 42 large tiered DT SACCOs controlled Kshs 592.14 billion or 77.56 percent. On the other hand, the 30 large DT SACCOs controlled Kshs 359.93 billion (68.87 percent) of the Kshs 522.59 billion controlled by the entire DT SACCO segment (SASRA Report, 2023). SASRA foresees the Large-tiered DT SACCOs will in the medium term economically out-run the very many Small-Tiered DT SACCOs and in the long-run, even the Mid-Tiered DT-SACCOs will not survive the phenomenon This is because the largest proportion of total assets and total deposits in the DT SACCO segment are controlled by few large tiered DT SACCOs (SASRA Report, 2022).

SASRA report (2022) indicate that in the year 2022, the DT SACCO segment had over 4.85 million active members and controlled total assets amounting to Kshs 763.5 billion in 2022. On the other hand, the gross loans portfolio amounted to Kshs586.16 billion while the total deposits grow to Kshs 522.59 billion in 2022. The deposit liabilities distributed as Ksh21.02 billion in fixed deposits; Ksh83.78 billion in withdrawable deposits; and Kshs 417.80 billion in non-withdrawable deposits. The withdrawable deposits held by DT SACCOs dropped from Kshs 114.59 billion in 2021 to Kshs 83.78 billion in 2022 representing a 26.89 percent decline, which SASRA attributed to the reduced savings propensity by members due to the harsh macro-economic conditions prevailing during most of the year 2022 such as high inflation, high exchange rates and droughts SASRA report (2023).

SASRA report (2022) shows 20 DT SACCOs grew their assets at faster rates than their core capital, which saw their core capital to total assets ratio fell between 5 percent and 10 percent in 2022. The number of SACCOs with the same ratios stood at 11 SACCOs in 2021. These SACCOs require increasing the rates at which they retain their surpluses in order to boost their ratios. However, 12 DT SACCOs were reported to be non-compliant with the core capital ratio and were thus operating on strict conditional or restricted deposit-taking licenses. On the other hand, 144 DT SACCOs were fully complied with the institutional capital to total assets ratio in 2022, an increase from the 125 DT-SACCOs which were fully compliant with the ratio in 2021. The foregoing shows that DT SACCOs have been able to make adequate retention from their surpluses for purposes of building their capital which enhances stability given that such capital is less expensive than the other sources of capital (SASRA report, 2022).

According to SASRA report (2022), the core capital of DT SACCO segment grew from Ksh109.29 billion in 2021 to Ksh124.89 billion. In the same period, the institutional capital to total assets ratio grew to 9.58 percent from 9.15 percent in 2021. The core capital to total assets ratio increased to 16.36 percent in 2022 from 15.81 percent in 2021 against the prescribed minimum ratio of 10 percent. The core capital to total deposits ratio also increased from 23.05 percent in 2021 to 23.90 percent reported in 2022. The report shows that in the year 2022, 168 DT SACCOs were able to maintain their core capital above the minimum requirement of Ksh10 million, while 8 DT SACCOs had their core capital below the prescribed threshold. Again, 168 DT SACCOs were able to meet the prescribed minimum core capital to total deposits ratio in 2022 against 163 DT SACCOs in 2021. Only 1 DT SACCO did not maintain the prescribed minimum but was still within the allowable threshold of over 50 percent of the prescribed minimum. 7 DT SACCOs were below the allowable threshold of fifty percent of the prescribed minimum (SASRA report, 2022). The table below presents the performance of the DT SACCO segment between 2017 and 2022.

Table 1.1: Performance of DT SACCOs in Kenya (2017 – 2022)

Year	2017	2018	2019	2020	2021	2022
Total Income (Billion)	63.04	64.64	79.88	86.04	95.9	106.5
Net Income after tax (Kshs.Billions)	11.23	11.27	13.68	15.68	10.51	18.12
Total assets (Kshs. Billions)	442.28	495.25	556.71	627.69	691.09	763.5
NPLs to Gross Loans %	6.14	6.3	6.15	8.39	8.86	8.4
ROA (%)	2.69	2.4	2.6	2.65	1.59	2.61
NPLs (Kshs. Billions)	21	23.57	25.79	39.86	46.27	49.24

Source: SASRA Reports (2017-2022)

Table 1.1 above shows the financial health of DT SACCO segment between 2017 and 2022 (SASRA reports 2017, 2018, 2019, 2020, 2021, 2022). NPLs to gross loans ratio moved from 6.14 percent in 2017 to 6.3 percent in 2018, to 6.15 percent in 2019, to 8.39 percent in 2020, to 8.86 percent in 2021 and to 8.4 percent in 2022. ROA trend has fluctuated, with the highest figure being 2.69 in 2017 and the lowest being 1.52 in 2021. Other values were 2.40 percent in 2018; 2.60 percent in 2019; and 2.65 percent in 2020 and 2.61 in 2022. The DT SACCO segment recorded an increase in NPLs from Kshs 46.27 billion in 2021 to Kshs 49.24 billion in 2022. This is supported by the increase of the provision for loan loss from 34.05 percent in 2021 to 36.95 percent in 2022. There is a general deterioration in all the indicators of asset quality in 2022 which shows poor liquidity because depositors can withdraw their savings at any time due to their personal expenses and/or alternative investments (Zhao Li & Kebin Ma, 2022).

1.2 Statement of the problem

The DT SACCO segment has faced numerous financial challenges associated with financial health. In 2022, Metropolitan SACCO underwent liquidity problems after experiencing huge losses. The problem began in 2019 after a surge in bad loans that squeezed the SACCOs liquidity, limiting its ability to meet its member refunds as well as withdrawals. A member moved to the Cooperative Tribunal seeking refund of his savings in 2024. In 2018, the license of Moi University SACCO was revoked and the SACCO was placed under liquidation in 2019 due to failure of meeting the statutory financial and liquidity ratios set out by SASRA. Between 2015 and 2021, Mwalimu SACCO, Stima Investment SACCO, and Ekeza SACCO were mentioned by SASRA and department of Co-operatives as among the SACCOs whose members had lost in

excess of Kshs3.6 billion (SASRA Report, 2020). Besides, the DT SACCO segment has experienced continuous increase in the NPLs to gross loans ratio, which were 6.14 percent in 2017, 6.3 percent in 2018, 6.15 percent in 2019, 8.39 percent in 2020 and 8.86 percent in 2021 (SASRA report 2018, 2019, 2020, 2021 & 2022). This implies that the loan default rate is on the increase and is unhealthy for the SACCO segment.

The DT SACCO segment displays a fluctuating return on assets (ROA) trend within the duration under the study, where ROA increased in some years while it slumped in others. ROA decreased from 2.69 percent in 2017 to 2.4 in 2018. It then increased to 2.6 in 2018 before increasing again to 2.65 percent in 2020. However, it dropped in 2021 to 1.59 before rising to 2.61 in 2022. This presents a highest of 2.69 percent and lowest of 1.59 percent during the period. A fluctuating ROA indicates challenges in forecasting or planning of the segment as its profitability might go in either way. This points to inefficiency in operations since the prolonged path represented by ROA is the best yardstick in evaluating financial health (Hagel et al., 2013). It therefore implies that available resources are not being utilized maximally and in a continuous manner in the generation of revenue (Wen, 2010; Hermuningsih, Kusuma, Fasa, & Panjaitan, 2020). A higher ROA implies more efficient utilize their resources (Hermuningsih, Kusuma, Fasa, and Panjaitan, 2020; Singh, Gupta & Chaudhary, 2024). The DT SACCO segment is therefore not health financially, a situation that limits its long-term planning and forecasting of performance (Green, & Zhao, 2022). If the trend continues, the segment might find itself making losses which might lead to reputational damage, which calls for the reassessment of resource allocation and optimization strategies.

There has been revocation and or conditional renewal of licenses for several DT SACCOs. According to SASRA reports (2018, 2019, 2020, 2021 and 2022), four licenses were revoked in 2021, three in 2019 and two in 2018. In 2017, twelve DT SACCOs' licenses were renewed conditionally, while in 2018, thirteen licenses were renewed conditionally. Other twelve licenses were renewed conditionally in 2019, while in 2020; another thirteen DT SACCOs suffered the same fate. The revocation and conditional renewal of licenses emanated from several reasons including non-compliance of prudential regulations in relation to asset quality, capital adequacy, or liquidity and related poor management. This has resulted in poor financial health which forced the SACCOs to utilize other resources in their disposal such as to run their day-to-day activities or paying interests and dividends to their members.

SASRA reports (2018, 2019, 2020, 2021 and 2022) show that the total expenditure paid from the total income kept on increasing. The total expenditure comprised of interest expense paid on members' deposits, which took the largest portion from the total income. According to SASRA report (2022), the interest expense paid on members' deposits accounted for 38.15 percent in 2021 and 38.70 percent in 2022 of the total income. On the other hand, the operating expenses represented 33.58 percent of the total income in 2021 and 34.53 in 2022 of the total income. The operating expenses were the second highest expense from the total expenditure. Again, SASRA report (2022) shows that the DT SACCOs' segment paid a higher mean interest rates on their members' deposits at 7.11 percent in 2022 compared to the mean interest rate paid by commercial banks on savings which averaged 3 percent in the year 2022.

SASRA reports (2018, 2019, 2020, 2021 and 2022), show that there has been a continuous increase in the provision for loan losses due to increase in NPLs. The DT SACCO segment showed that the provision for loan loss increased from Ksh 25.79billion in 2019 to Ksh 28.97 billion in 2020, Ksh33.65 billion in 2021 and Ksh36.73 billion in 2022. The non-performing loans have been on the increase, moving from Ksh 25.79billion in 2019 to Ksh 39.86 billion in 2020 to Ksh46.27 billion in 2021 and to Ksh 49.24 billion in 2022. According to SASRA (2017; 2018; 2019; 2020, 2021 & 2022), the ratio between total expenses and total revenue in this segment have been on the increase. This has been occasioned by the high percentage of payment of interest on deposits as well as the operating expenses. The shows that both interests on deposits as well as NPLs have been on the increase implying that, the same members who have continuously defaulted in loans payment are ultimately rewarded with high interest payment on their deposits.

Many studies conducted in Kenya under this topic have been limited to specific counties in Kenya rather than the entire country. Onyango (2018) studied on the effect of capital adequacy on financial performance on DT SACCOs in Nairobi County. Mutunga and Gatauwa (2021) studied on firm characteristics and financial performance on DT SACCOs in Nairobi County. Lekaaso, Cherono and Rintari, (2020) studied on the effect of capital adequacy on the financial performance on SACCOs in Samburu County while Kariuki (2016) studied on the effect of asset quality on financial performance on SACCOs in Nairobi County. Besides, Achieng (2017) studied on the influence of liquidity portfolio on the financial performance and focused on SACCOs in Eldoret. This shows existence of a geographical gap from previous studies. The study

considered all the DT SACCOs operating in Kenya during the period between 2018 and 2022.

There are contradicting findings on the effect of prudential regulation on financial health in different sectors, some showing positive and significant effect, while others show positive and insignificant effect. Others show no significance or even no direction in the relationship. Esokomi and Mutua (2018) assert that asset quality has a negative and significantly affect the financial performance of SACCOs. Kamran, Omran & Arshad, (2019); Daoud and Kammoun (2020) found that capital adequacy has a positive and statistically significant effect on financial stability in banks. Oduor (2020) found that the effect of capital adequacy on the financial performance of listed commercial banks in Kenya to be positive but weak. On the other hand, Adegheet *et al.*, (2019) found that the effect of capital adequacy on the financial performance of banks is positive but insignificant. Mutunga and Gatauwa (2021) found a positive effect of capital adequacy on the financial performance of SACCOs in Nairobi City County, though the level of significance was not stated. However, Nyanyuki (2022) findings were contrary to other findings and stating that there existed a negative association between capital adequacy and financial performance of commercial banks in Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

To investigate the effect of prudential regulation on the financial health of deposit taking savings and credit cooperative societies in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives:

- i. To establish the effect of asset quality on financial health of deposit taking savings and credit cooperative societies in Kenya;
- ii. To establish the effect of capital adequacy on financial health of deposit taking savings and credit cooperative societies in Kenya;
- iii. To determine the effect of liquidity on financial health of deposit taking savings and credit cooperative societies in Kenya;
- iv. To determine the moderating effect of technical efficiency on the relationship between prudential regulation and financial health of deposit taking savings and credit cooperative societies in Kenya.

1.4 Research Hypotheses

The study was guided by the following null hypotheses:

H₀₁: Asset quality has no significant effect on financial health of deposit taking savings and credit cooperative societies in Kenya

H₀₂: Capital adequacy has no significant effect on financial health of deposit taking savings and credit cooperative societies in Kenya

H03: Liquidity has no significant effect on financial health of deposit taking savings and credit cooperative societies in Kenya

H04: Technical efficiency has no significant moderating effect on the relationship between prudential regulation and financial health of deposit taking savings and credit cooperative societies in Kenya.

1.5 Significance of the Study

The study provides a basis for establishing the effect of prudential regulation on the financial health of DT SACCOs in Kenya. The findings of the study is a reference point and a spring board to future researchers and scholars who will undertake similar studies. The findings of the study add more knowledge to the existing body of knowledge on prudential regulation and financial health which if well harnessed, the knowledge can be extended in carrying out more studies to improve the financial health of the sector, other financial sectors and industry at large. The study is also a focal point that sheds light to the regulator and government in the policy formulation and development. The findings support the DT SACCOs management in enabling the institutions to become more sustainable to withstand competition in the industry. The management also benefit by understanding better the effect of prudential regulation on the financial health of the financial institutions and the importance of complying with them. Such knowledge will benefit the segment and the entire industry which will enhance their contribution to the economic growth of the country.

1.6 Scope of the Study

The general objective of the study was to investigate the effect of prudential regulation on the financial health of DT SACCOs in Kenya. Prudential regulation, which was the independent variable was unpacked into three variables namely; asset quality; capital adequacy, and liquidity. The study focused on the DT SACCOs operating in Kenya that were licensed to carry out deposit taking business and were regulated by SASRA between 2018 and 2022. The study concentrated on DT SACCOs due to their influence and accessibility by the common citizens which majorly contributes to the financial inclusion in the country. The geographical scope was within Kenya where the target population was 176 DT SACCOs. The scope was important due to the contribution of the economic growth of the DT SACCOs in the country. Kenya being the leading country in Africa in terms of cooperative movement made the study of DT SACCOs in Kenya important. The time scope was between 2018 and 2022 when the ROA of the segment was quite fluctuating and therefore the study was relevant in the period. The year 2017 saw the highest ROA which dropped in 2018 and has not been regained the rate to date. Inclusion exclusion sampling criteria was adopted where some SACCOs were included in the sample while others were excluded.

1.7 Limitations of the study

Several limitations were encountered during the study. The data collection process faced challenges because the SACCOs did not classify various accounting items with uniformity. Many SACCOs based various accounting items on individual objective decisions depending on the sector they are operating in. In order to get uniform classification of these accounting items, the researcher consulted with the regulator for

guidance. Again, some DT SACCOs ceased business during the study period while others were registered during the same period. This resulted in incomplete data sets for several SACCOs, resulting in unbalanced data panels. To resolve this, the researcher applied the inclusion-exclusion criteria to ensure that, only those DT SACCOs with complete sets of data were included for data analysis. Another limitation came from limited literature for review. This was mitigated by reviewing relevant studies from other sectors and other countries. Finally, the quantitative secondary data collected was prone to inherent weaknesses such as biasness and errors that could reduce the reliability and validity of findings. This was mitigated by conducting various diagnostic tests.

1.8 Organization of the Study

The study was organized into five chapters namely; chapter one, chapter two, chapter three, chapter four and chapter five. Chapter one was the introduction of the study. Chapter two was the literature review, while chapter three was the research methodology. Chapter four presented the research findings and their discussion, while chapter five summarized the findings in chapter four, and presented conclusion and recommendation of the study. In the introduction part of the study, the background of the study was covered, together with the statement of the problem, objectives of the study, research hypotheses, the significance of the study and the limitations of the study. The literature review section consisted of both the theoretical literature and the empirical literature. The research methodology section represented both the research philosophy and research design adopted to guide the study was discussed. The chapter also presented the empirical model which was fundamental in the running of data.

Chapter three also discussed the process through which data was collected and analyzed; besides carrying out various diagnostic tests before and fitting the model. In chapter four, data analysis was carried out and the findings were presented. In chapter five, interpretation of results and discussion of findings were presented. Besides, conclusion and recommendation were discussed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter discussed several relevant theories that were the pillars on which the study was anchored. These theories were analyzed and their relevance in application to the study brought into perspective through discourse. The chapter also laid out a comprehensive survey of previously related published studies that assisted in the process of extraction of existing relevant knowledge. This enhanced the understanding of the current topic on issues relating to both content and context nature. To do this, several relevant studies were analyzed and critiqued in order to identify the existing gaps and later the gaps were addressed. A conceptual framework was later presented to depict the links existing between the various variables.

2.2 Theoretical Literature Review

Theoretical literature review involved the establishment of existing relevant theories and their contribution to the current study. As such, each theory in the study was reviewed and analyzed to bring out its relevance and contribution in the study. According to Saunders *et al.*, (2009), a theory is an explanation which is upheld by proof intended to clarify a phenomenon. Several theories that guided the study included the Financial Theory, Disruptive Innovation Theory, Shareholders Theory, Intermediation Theory, Buffer Capital theory, information Asymmetry Theory, Liquidity Shiftability Theory and Efficiency Structure Theory.

2.2.1 Financial Theory

The theory, commonly dubbed as the financial instability hypothesis (FIH) was pioneered by Hyman Minsky in 1974. The theory strived to contribute a comprehension and clarification of the attributes of financial crises. The theories proposed by Minsky associated financial market fragility, in the typical life cycle of an economy, with speculative investment bubbles intimate to financial markets. Minsky attested that in flourishing times when corporate cash flow surpasses what is required to pay off debt, a hypothesized euphoria is established, and suddenly, debts exceed what borrowers can pay off from their approaching revenues, thereby producing a financial crisis. Due to such speculative borrowing bubbles, banks and lenders tighten their credit availability, even to institutions that can afford loans, and the economy thereafter contracts. The Minsky's model of the credit system, which Minsky dubbed the financial instability hypothesis incorporated many ideas. He stated that, an underlying distinction of an economy is that the financial system oscillates between robustness and fragility, and these swings are an indispensable part of the process that generates business cycles. The financial instability hypothesis looks at the economy as having financing regimes under which it is stable, and financing regimes in which it is unstable. The financial instability hypothesis theory portrays the impact of debt on system behavior and incorporates the manner in which debt is validated.

To control these oscillations, Minsky called for the government's intervention in order to regulate these oscillations, through regulation by relevant bodies such as central bank and other tools. Minsky asserted that a major mechanism that thrusts an economy in the

direction of a crisis is the conglomeration of debt. Minsky singled out three types of borrowers that contribute to the pileup of insolvent debt. These were the hedge borrowers, the speculative borrowers, and the Ponzi borrowers. The “hedge borrower” make debt payments to cover both interest and principal from current cash flows from investments while for the “speculative borrower”, the cash flow from investments can service the debt and cover the interest due but regularly roll over the principal. The “Ponzi borrower” borrows on the basis of believing that the appreciation of the value of the asset will be enough to refinance the debt, but could not make sufficient payments on interest or principal with the cash flow from investments. Only the appreciating asset value can keep the Ponzi borrower afloat. Ponzi borrowers are not able to fulfill either the repayment of principle or the interest due on outstanding debts where they end up borrowing to pay interest or selling assets to pay interest.

Since most investments' capital gains are not likely to be adequate to pay both interest and principal, the use of this finance is fraudulent. Though the use of Ponzi finance can be generally enough in the financial system, the unavoidable adversity of the Ponzi borrower can create seizing up of the system when the asset prices stagnate (bubble pops). In similar circumstances, the speculative borrower can no longer refinance (or roll over) the principal, even though he is able to cover interest payments. Minsky further stated that, the collapse of the speculative borrowers can bring down even hedge borrowers, who are unable to find loans despite the apparent soundness of the underlying investments. The theory underpins the study since in the day-to-day business of DT SACCOs may experience oscillations between robustness and fragility it is stable. Sine the financial instability hypothesis portrays the impact of debt on system

behavior, DT SACCOs instability is mostly affected by the level of NPLs prevailing. Borrowers in DT SACCOs classified into five categories according to their level of servicing their loans, namely; performing, watch, substandard, doubtful or loss categories.

Hedge finance units in the finance theory can be related to borrowers in the performing category in the DT SACCOs, who fulfill all their contractual payment obligations of paying both interest and principal. On the other hand, the speculative finance units are presented by those borrowers who meet their payment commitments on their liabilities, even though they cannot repay the entire principal. Such borrowers in the DT SACCOs are those in the watch, substandard and the doubtful categories and who can roll over their liabilities. Lastly, Ponzi units are represented by borrowers in the loss category in the DT SACCOs who cannot service their loans and interest. As postulated by Minsky, during flourishing times when the DT SACCOs' cash flow is too high and surpass their requirement, a hypothesized euphoria may occur where the SACCOs may initiate radical strategies such as market campaign to increase their loan book by giving huge loans which are speculative. This ends up overburdening the borrowers and results in loan defaults, subsequently plunging the SACCO into financial crisis. Due to such speculative borrowing bubbles, DT SACCOs will then tighten their credit availability, even to borrowers who can afford loans, and the status of the SACCO will thereafter improve.

Minsky theories are however regarded as weak since they are stated verbally, with no mathematical models on which they are built or based. Again, Minsky selected to apply interlocking balance sheets rather than mathematical equations to model economies. On the other hand, Minsky disagreed with numerous conventional economists and contended that, financial system oscillations, with the booms and busts are imminent in a formal free market economy. Consequently, these theories have not been incorporated into mainstream economic models, which do not include private debt as a factor. Besides, Minsky's theories, emphasize the macroeconomic dangers of speculative bubbles in asset prices, which deters them from incorporation into central bank policy. However, in the wake of the financial crisis of 2007–2010, there was increased interest in policy implications of the theories, with some central banks advocating that central bank policy include the Minsky factor.

2.2.2 Disruptive Innovation Theory

The theory was coined by Christensen in the mid 1990's. The theory explains the phenomenon by which an innovation transforms an existing market or sector by introducing simplicity, convenience, accessibility, and affordability where complication and high cost are the status quo. According to Christensen, disruption is a process whereby a smaller firm with fewer resources is able to successfully challenge established incumbent businesses. As DT SACCOs seek profits by financing activity, they should be aware that innovation assures profits. A disruptive innovation is formed in a niche market that may appear unattractive or inconsequential to industry incumbents, but eventually, the new product or idea completely redefines the industry. Disruption occurs when a new innovation displaces the dominant one from the market,

and mainstream customers shift their preferences in favor of the disruptive innovation, and incumbent firms fail to respond to the disruptive innovation in a timely manner (Cubero, Gbadegeshin & Consolación, 2021).

Competitors with disruptive innovations lull incumbent companies into complacency by avoiding a head-to-head competition for the incumbents' best customers. They target instead new and low-end customers with products and services that are not as good as those currently available. Disruptive innovation thus creates a new market by addressing customers not previously served by incumbents. Besides, the current business operates in highly dynamic environment due to technological orientation (Nieto, Gbadegeshin, & Consolación, 2021). Due to the current digitization trends firms will be obliged not only to rely on incremental innovations but also on radical innovations to remain relevant (Kraus, Roig-Tierno, Bouncken, 2019). Disruptive innovations have lower quality at launch compared to established products in terms of the performance dimensions that are important to mainstream customers. This happens when products have attributes that customers consider important to gain relevance and the product performance exceeds their requirements (Varma, Shivinder, Kiran, Simon, & Ramona, 2022).

Disruptive innovations are mostly introduced into the market by new firms to consider the unappreciated customer groups (Alexandra-Maria Danilet, 2022). Incumbent firms target the most profitable customer segment who promise high profits and who have a high willingness to pay, thereby neglecting the other customers. Incumbents depend on the customers with a high willingness to pay and therefore exclusively make product

improvements, and especially when the incumbent has absolute data access for personalized pricing (Esteves, & Carballo-Cruz, 2023). However, this attitude becomes problematic when the new product improves to the point where it meets the requirements of the mainstream and the most demanding users in the market, thus becoming fully competitive.

Disruptive innovation has products with unique features and is initially demanded by a smaller customer group which either has low demands on the product performance or has a low demand by mainstream customers resulting in a low profit margin (Mookerjee & Rao, 2021). This makes the new competition of little interest to the incumbents, who prefer to concentrate on their main customers. Although inferior, disruptive products have other attributes such as, they are simpler, more convenient, and less expensive. Disruptive innovation therefore aims at locking customers in a new way by lowering gross profit, not following the traditional trajectory of improving the performance valued by mainstream consumers, introducing new trajectory of performance and improving performance along parameters different from the traditional ones (Zeng, Shi, Wei, & Zafar, 2023).

Disruptive innovation has three assumptions. First, in every market there is a distinctly different trajectory of improvement that innovating companies provide as they introduce new and improved products. An incumbent business's improvement trajectory results from the year-by-year improvements that all good companies grind out. Good managers strive to make better products that they can sell for higher profit margins to not-yet-satisfied customers in more demanding tiers of the market (Weinreich, Şahin, Karig, &

Vietor, 2022). Another assumption is that the pace of sustaining innovation along the trajectory of particular value propositions almost always outstrips the ability of customers in any given tier of the market to use it. Thus, a company whose products are squarely positioned on mainstream customers' current needs will probably overshoot what those customers are able to utilize in the future. The third assumption is that the incumbent companies frequently possess the capabilities needed to succeed, but managers fail to employ them effectively to combat potential disruptors by addressing the potential threat in a new market (Zeng *et al.*, 2023).

Disruptive innovation creates an unstable financial environment due to competition, where digital platforms have capitalized on the opportunity to compete in the market (OECD, 2020; Knudsen, Lien, Timmermans, Belik, & Pandey, 2021). Many financial institutions are embracing the digital lending platform where customers can save and access credit remotely, open accounts and do non-traditional credit scoring to deliver fast and convenient loans. If DT SACCOs do not react fast and embrace the robustness of technology, they will be destabilized by the upcoming digital platforms that offer financial services and their financial performance will greatly diminish. The DT SACCOs will have to start moving away from the brick-and-mortar models of doing business and enter into the digital world (SASRA Report, 2022). However, the theory is not applicable in the real world because not every innovation is disruptive and not every start-up will beat the incumbent. This means that not every big company is going to be disrupted by upcoming businesses (Dzimba & Poll, 2022). Again, the founder did not specify the exact probability of failure, but left little doubt that it is very high (Chevalier-Roignant, 2024).

2.2.3 Shareholder Theory

In 1970, Milton Friedman coined the shareholder theory also known as Friedman Doctrine. According to the theory, the maximization of the shareholders' value is the greatest responsibility an enterprise. Friedman believed that shareholders form the backbone of an entity, and should therefore be treated with utmost respect. The theory considers shareholders as the economic driving force of an organization and thus, the optimum objective of a business should be to grow its profits in order maximize returns to its shareholders. Besides inventing in strategies that generate additional revenues through enriching and creating more of products, cost minimization is used to maximize profits. According to Friedman, shareholders should take charge of key decisions rather than relying on an outsider. When a manager fails to meet the targets of the shareholders, he is replaced by those who do. This ensures both the long-term survival of an enterprise and uphold that of its stakeholders' interests are. However, shareholder theory fails to consider that many organizations have other objectives, besides focusing on the financial performance aspect.

The theory underpins the study because DT SACCOs are member-based socio-economic enterprises. Members of DT SACCOs are at the same time own the SACCOs through buying of shares in the institutions. They also take a center stage in the management of the institutions since board members are elected amongst the members. DT SACCO managements strive to have a good financial performance of the institutions in order to maximize members' benefits through returns (Omotoso, Oni & Ramalefane, 2025). They conduct the affairs of the institutions with a clear eye of fulfilling their obligations to the SACCO members while reporting directly to the board

members. With high surplus, DT SACCOs pay reasonable interest on members' deposits as well as dividends on shares. The management also ensures that members funds are save by observing the prudential regulations set by SASRA. DT SACCOs rarely participate in corporate social responsibilities as they aim at giving its members high returns, a practice replicated in the shareholders' theory.

Friedman's theory is criticized because it advocated corporations to use their influence to block laws that cause harm to them (Lai, 2022). This made shareholders' theory wildly popular because it seems to absolve corporations of difficult moral choices and protect them from public criticism as long as they make profits. Friedman argued that business executives were there to act in the interest of shareholders so as to give them the highest return possible. However, Friedman did not give room for corporate or charitable contributions, and if it happened, it was reciprocated through higher prices to customers, lower wages to employee, or shareholders lower returns. By stating that business executives are employees of the shareholders, Friedman was not correct because legally, executives are employed by the corporation and not under the shareholders' control. He claimed that the business executives, although extremely far-sighted and clear-headed in matters that are internal to their business, evidently became short-sighted and muddle-headed in matters of public import. Many business executives realized that wage and price controls would serve their business interest and did not care whether they harmed the economy at large.

Friedman's theory is also criticized because corporations use their influence to block laws that cause harm to them. Friedman cherished political influence to dismantle the free market by arguing that an established business will make the most profits by eliminating competition, persuading the government to pass laws that discourage new firms from entering the market, or reduce its costs. This made big public corporations to be elevated for the free market which was unrealistic. Big corporations became islands of socialism within the market economy, where their bigness protects them from competition for customers and workers which can result in market failure (Aryan, 2024). Investors and managers of capital are happy when product and labor markets are monopolized because of the benefit that accrues, hence they accommodate them. Friedman's theory was wildly popular because it seemed to absolve corporations of difficult moral choices and protected them from public criticism as long as they made profits (Ugbeta, 2021).

Shareholder theory has also been criticized for not considering other objectives that are based on financial performance other than prioritizing on maximization of returns for shareholders (O'connell & Ward, 2020). The theory disregards other important entity's stakeholders such as employees, customers, and communities which can lead to negative social and environmental impacts. To achieve high returns, an entity can potentially be involved in unethical behavior and decide to focus on short-term decision-making strategies and neglect long-term sustainability and interests of other stakeholders and environment. Such a practice can reduce accountability for broader societal issues and corporate social responsibility. Prioritizing on short-term gains over long-term investments strategies can also lead managers to potentially harm the

company's future sustainability by adopt unethical practices like exploiting workers, damaging the environment, or engaging in fraudulent marketing scheme and explosive stock prices and market instability. Besides, the precise definition and evaluation of shareholder value can be complicated, leading to conceivable influence and misinterpretation.

Shareholder theory is based on several assumptions. Shareholders are regarded as the owners of the entity, with a direct entitlement to the assets and profits. The theory assumes that shareholders are entitled to an entity's assets in a similar format as a person possesses private property. Shareholders know the worth of the entity assets via dividends and share price. Shareholder theory assumes that the primary goal of an entity is to maximize the profits of its shareholders. This is achieved through efficient resource allocation and business operations. The management therefore focuses on optimizing the shareholder value, which supersedes the interests of other stakeholders. The theory also assumes that entities have negligible social responsibilities after maximizing shareholder wealth, with shareholders left to decide on social initiatives themselves. Thus, shareholders must be in control of crucial rulings, such as collective activities. The utilization of an entity's assets is under the control of the shareholders' approval.

2.2.4 Buffer theory of capital adequacy

Calem and Rob developed this theory in 1996. It postulates that, financial institutions tend to retain a level of their available capital above the required minimum level set by the regulators. With the excess capital, a financial institution is ensured of a low probability of its capital level falling below the minimum requirements. The theory depicts that, as the capital ratio approaches the regulatory minimum, financial

institutions pump in more capital in order to minimize risk that is set by the regulator, while at the same time avoiding the related regulatory costs associated with the breach of such requirements. Adequately capitalized financial institutions are strong to undertake risky ventures which subsequently bring forth more profits. This relationship has become a great concern to regulators who have gone ahead and set minimum requirement level of capital adequacy to financial institution in order to ensure their financial soundness, solvency and stability is unquestionable (Gupta & Kashiramka, 2020).

Financial institutions with high capital buffers maintain such capital levels while those that are poorly capitalized plan to increase their capital levels to avoid risk while at the same time anticipating higher returns. Higher capital ratios translate to higher liquidity levels which enhance the ability of financial institutions giving out more loans (Begenau, 2020). According to Andersen and Juelsrud (2024) implicit and explicit costs are incurred when capital ratio drops below the statutory minimum requirement. Implicit cost includes increase in demand for insurance while explicit costs include penalties and restrictions that may be enforced by the regulator when such minimum regulation requirement is breached (Agénor, & Silva 2021). Capital requirement is an important tool monitors the stability of financial institutions, giving the incentives to improve on their risk management, thereby reducing risk (Begenau, 2020).

Well capitalized SACCOs are able to advance more loans and advances to their members thereby generating more income which boosts their financial performance as opposed to those that are poorly capitalized (Teshome et al., 2018). Additionally, a

higher capital adequacy ratio represents a stronger buffer against liquidity risk (Setiawan & Muchtar 2021). Capital requirement constitutes a fundamental supervisory requirement in DT SACCOs and SASRA directly conduct on-site examination to ensure that the requirement is adhered to. In case a breach of the capital requirements is found to exist, the undercapitalized SACCO is given a defined period to redeem itself and if it does not, its license is revoked (SASRA Report, 2023).

Capital buffer theory is based on several assumptions. Capital buffer assumes that more capital acts as a cushion against unexpected losses. However, this prompts financial institutions to prioritize financial stability over maximizing short-term profits. Financial institutions deliberately maintain a level of capital higher than the regulatory minimum to build a capital buffer that shields them from potential economic depressions because when the cost of capital falls below the minimum, it attracts regulatory penalties and loses market confidence. The financial institutions are therefore induced to maintain a buffer to avoid such repercussions because financial institutions are risk-averse and select to hold extra capital as a precaution against unprecedented economic slumps. This is because there is a trade-off between profitability and safety in that while a larger capital buffer provides greater financial stability, it can also reduce a financial institution's potential profitability by limiting lending capacity. Since the risk profile of a financial institution is dynamic in nature and can fluctuate over time, there is a necessity for a flexible capital buffer to adapt to dynamic market conditions.

Capital buffer theory has been criticized due to its restricted applicability in crisis situations because during crises, financial institutions are reluctant to reduce their capital buffers due to fears about market approach, possible credit rating deteriorations, and the pessimistic signaling effect of violating the buffer, inducing low lending and economic slowdown (Abbas, Yousaf, Ali, & Wong, 2021). Again, if financial institutions are too prudent about utilizing their buffers, it could contribute towards a pro-cyclical consequence where they shrink their lending in times of economic downturns, thereby aggravating the economic downturn. The interconnection of different capital requirements and regulations can restrict the utilization of capital buffers, as financial institutions might be compelled by other requirements prior to fully utilizing their buffers (Cappelletti, Reghezza, Rodríguez d'Acari, & Spaggiari, (2022). The presence of capital buffers could generate moral hazard, motivating financial institutions to accumulate more risk in usual times, realizing that they have a shield to fall back in time of crisis. On the other hand, conserving excess capital buffers can prospectively diminish the amount of capital accessible for lending, certainly impending economic growth, especially in small economies.

2.2.5 Information Asymmetry Theory

Three economists Joseph Stiglitz (1961), George Akerlof (1970) and Michael Spence (1973) are the proponents of the theory. The concept of asymmetric information centers on a situation in which there is unequal knowledge between each party to a transaction. The theory states that, differentiating between a good and a bad borrower in the financial market may create a challenge due to the problem of asymmetric information. This is because the borrower contains much more of his credit situation information

than the lender, which he also tends to conceal. The information asymmetry eventually results in poor credit performance by the borrower due to inefficiencies caused by lender's poor decision making based on the uninformed decisions. According to Harishchandra, (2021), information asymmetry can result in either adverse selection or in moral hazard problem.

Adverse selection arises when a financial institution makes an incorrect lending decision with regard to the quality and management of a small firm which makes a loan risky (Ikeda, 2020). According to Das, Rathi and Suresh (2024) moral hazard arises when the management of a firm fails to perform to its full capability since lender cannot effectively monitor projects undertaken by small firms, which results in a shortfall in finance provision. Indeed, borrowers would tend to prefer high-risk projects during the periods of higher interests. According to Ikeda (2020a), if a lender cannot identify the borrowers with the riskier investment projects, he may decide to cut down the number of loans he makes, which subsequently causes the supply of loans to decrease rather than increase, thereby resulting in higher interest rate. Information asymmetry can result in credit rationing where some borrowers are arbitrarily denied loans. This occurs because higher interest rates lead to even greater adverse selection. The borrowers with the riskiest investment projects will now be the likeliest to want to take out loans at the higher interest rate. This implies that good borrowers (low risk borrowers) pay high interest rates than they should pay, while bad borrowers (high risk borrowers) pay less interest rates than they should. This drives away good borrowers and the banking sector is left with bad borrowers' "lemons" (Ikeda, 2020b).

The problem of asymmetric information can be solved by the lender retrieving credit rating of the borrower from a registered credit rating bureau, or by demanding for collateral to secure a loan in case of default. The problem of adverse selection is an incentive to syndicate risky loans, can be mitigated by information sharing among lenders (Dari-Mattiacci, Onderstal, & Parisi, 2021). On the other hand, the use of collateral can make lenders mitigate adverse selection and moral hazards problems (Ioannidou et al. 2022). According to Ye, Wang, & Yang (2022), models have been developed where an uninformed lender can monitor firms with limited public information before investing in them. Moral hazard problems can be mitigated with monitoring and due diligence responsibilities (Nurhazwani, Syarifah, & Syed, Mansur, Mustazar, & Hazrul, 2024). Potential moral hazard and adverse selection problems caused by the imperfect information between borrowers and lenders can be solved by screening and monitoring borrowers. This is from the information obtained by checking customers' accounts transactions and other sources, writing contracts, monitoring contractual performance to resolve NPLs problems (Saunders, Shao, & Xiao (2023).

Asset quality variable is underpinned by asymmetric information theory because members of DT SACCOs can hold significant information and fail to disclose it to the lender while taking loans. The information might include their critical credit information as well as other financial commitments from other financial institutions. SACCOs end up giving the loan to risky borrowers whose ability to service them is questionable. This is because they rely on insufficient information thereby making skewed decision. Since most of the borrowers are small businesses such as MSMEs,

effective monitoring becomes a challenge by the SACCOs. Eventually, these loans become NPLs which affects the financial performance of the SACCOs. High NPLs imply that SACCOs will incur higher costs due to high loan loss provisions and also higher costs to recover the NPLs, which negatively impacts financial performance. Increase in NPLs has a negative impact on asset quality of DT SACCOs which negatively impacts on their financial stability.

Information asymmetry theory is based on the assumption that imbalance in knowledge in a transaction occurs where there is one party that possesses significantly more information about a product, service, or situation than the other party in the transaction. The information gap can be related with quality, condition, or true value of the product or service being transacted, regarded as "hidden characteristics" to the less informed party. The well-informed party is most likely to exploit this unfair advantage and influence the terms or prices of the transaction for their own interest, leading to adverse selection. This can steer the market to inefficiencies and skewed decision-making. When the well-informed party voluntarily enters into an agreement to the extent that it is unfriendly to the other party, adverse selection occurs. Again, when one party alters its behavior after an agreement is completed due to the other party not being able to fully monitor their actions moral hazard occurs. To mitigate information asymmetry, a mechanism needs to be established where the party with better information sends signals to the other party to convey their true quality or intentions.

Information asymmetry theory has several limitations. It assumes that all parties involved in a transaction act rationally, making decisions based solely on available information. However, in the real-world, decisions are often influenced by other factors such as emotions and biases which lead to deviations. The theory often overlooks the costs associated with acquiring and processing information where in reality, gathering and analyzing information reduce the information imbalance. The theory assumes that information asymmetry remains static, neglecting the fact that individuals can learn and adapt over time, potentially reducing the information imbalance. The theory assumes that one party always has complete information advantage over the other, which can be unrealistic in certain situations, making its application in practical situations to be challenging since quantification of the exact level of information imbalance between parties in a transaction is difficult. Information can be partially distributed differently across different actors, making it difficult to accurately measure the degree of information imbalance in real-world scenarios because markets can sometimes develop mechanisms to reduce information asymmetry, such as reputation building, standardization, and third-party verification, which are not always fully captured in the theory.

2.2.6 Liquidity Shiftability Theory

The theory was advocated by Moulton in 1915 and postulates that banks need to make by short-term commercial transactions that will mature in a timely manner to keep prepared to meet the demands of their depositors. These assets should be perfectly shiftable for cash without material or capital loss so that banks do not rely on maturities. This strategy enables banks to manage liquidity needs and avoid liquidity risk (Oganda,

Mogwambo & Otieno, 2020). Financial institutions have an obligation of meeting liquidity demands which they can plan by controlling their convertible assets in an advanced and timely manner in order to evade mishaps may arise due to unanticipated situations. Banks therefore have an important function of creating liquidity by offering deposits that are more liquid than the assets that they hold (Thakor & Yu, 2024; Sahyouni & Wang, 2019). Thus, the value of banks is subject to multiple equilibria where their deposits are worth their face value under a good equilibrium and worth something less under a bad equilibrium (Robatto, 2019; Van der Kwaak, Madeira, & Palma, 2023).

Illiquidity can bring about loss of confidence in a financial institution which can trigger a bank run (Chernykh, Davydov & Sihvonen, 2023). So long as bank depositors retain confidence in the financial institution's solvency, and in the willingness of other depositors to limit their withdrawals, the situation remains in equilibrium. If something happens to accelerate the rate of deposit withdrawals, however, it becomes rational for all depositors to seek to withdraw their deposits. This is because they all know that if withdrawals continue, the financial institution will be forced to sell illiquid assets, incurring losses and eroding its capital. The vulnerability of banks is as a result of the interaction of liquid liabilities that are repayable on demand at par and illiquid assets that can only be realized at short notice (Libich, Nguyen & Kiss, 2023).

The liquidity variable underpins the study because the day-to-day business of DT SACCOs is handling of cash. They must therefore ensure they maintain adequate liquidity readily available to match any unanticipated cash withdrawals. DT SACCOs

must therefore continuously adjust their liquidity levels and ensure that their financial intermediation activity is not exposing to liquidity problems due to cash inadequacy (Zhang, He, & An, 2020). Since members' withdrawals are less than their deposits, excess funds should be directed to liquid investment which can be converted back to liquid cash promptly whenever there is an urgent liquidity gap to be filled (Vuong, Phan, Nguyen, Nguyen, & Duong, 2023). If a SACCO fails to meet its members' withdrawal demands, a bank run can result since members will suspect the SACCO will liquidate soon and they will lose their savings. In order to maintain financial stability in DT SACCOs as well as mitigate their possible liquidity risk, a higher liquidity ratio is desirable (Kiss, Rodriguez-Lara, & Rosa-Garcia, 2022). According to Gweyi, (2018a), the activities of DT SACCOs are based on cash and therefore depositors can make unexpected withdrawals of their deposits without giving reasons.

The theory has been criticized for several reasons. The shiftability of assets provides liquidity only to the particular financial institution concerned, which does not apply to the entire financial system that relies on the prevalent economic conditions. Besides, shiftability theory disregards the notion that during economic crises, shiftable assets might not find any market thereby losing their purpose. This is because there no bank will be willing to buy the investment but on the contrary all those banks that possess them will be more than willing to sell them. In case all banks decide to liquidate their assets, a cost will be incurred which will lower the price of these assets. Ultimately, they will increase the liquid condition of the entire banking system. In case only one bank holds large amounts of shiftable assets and then attempts to dispose them at a time when there is a bank run, the result will have a negative influence on the whole

financial system. If every financial institution concurrently begins shifting their assets, the result will be catastrophic to both the financial institutions and the borrowers.

Liquidity shiftability theory states that financial institutions can effectively manage their liquidity by holding assets that are easily transferable and can easily be converted into cash in form of commercial paper and treasury bills. By doing so, the theory also assumes that there is always a readily available secondary market for these assets that allow the affected financial institution to quickly sell them without significant losses. It assumes that the assets will maintain their capital value, even in times of crisis. However, during financial crises, markets can paralyze, making it hard to dispose the assets without major price drop, which can lead to inaccessibility of funds to meet their obligations (Nwaguru, Law-Biaduo & Anukam, 2024). The shiftability theory principally focuses on short-term liquidity requirements, potentially neglecting the significance of long-term funding stability. Financial institutions need to control both short-term and long-term liquidity risks effectively. The modern financial system is sophisticated, with various types of assets and market contributor. The shiftability theory cannot sufficiently show the degree and complexities of liquidity management in these markets.

2.2.7 Efficiency Structure Theory

Demesetz came up with the theory in 1973. According to the theory, the internal bank's management decisions together with its policy decisions determine the institution's earning capability as well the portfolio of its financial investments. These eventually determine the level of its shareholders' returns. Both the X-efficiency and the scale efficiency hypotheses form the foundation of the efficiency structure theory, with the

former being founded on the belief that financial institutions have established solid management that are capable of controlling costs and growing revenue which leads a bank in adopting best practices that produce attractive results with the cost curve being at the bottom end (Bhuwan, 2024). Scale efficiency is built on the perspective that financial institutions operate under a robust functional ranking that helps lower their cost which subsequently results in the economies of scale. When costs are at their lowest, profitability improves. This subsequently boosts the growth rate.

Technical efficiency variable underpinned the efficiency structure theory. Technically efficient financial institutions produce a given set of outputs using the smallest possible number of inputs. Efficiency makes financial institutions more resilient to shocks, promote economic growth, solve the problem of information asymmetry and mitigate economic fluctuations. Thus, a technically efficiency financial institution operates optimally, hence at its maximum level from the resources it has available. Technical efficiency forms a foundation of the study because SACCOs should perform efficiently by controlling their costs and ensuring that there is growth in revenue. Subsequently, better financial performance will be realised. DT SACCOs' management should improve on their efficiency in order to enhance profitability which is reflected in ROA. First, DT SACCOs should strive to improve on their scale efficiency to enjoy the economies of scale since larger market share enhances concentration which results in rise in profitability. Secondly, better management practices should be adopted for DT SACCOs to generate more revenue through efficient utilization of assets while controlling costs. This will in turn result in high profitability and high ROA.

Efficient DT SACCOs generate more profits due to lower costs as a result of economies of scale. By combining and improving on both the X-efficiency and the scale efficiency, DT SACCOs will be able to improve on their financial performance. SACCOs need to be technically efficient in their intermediation process in order to generate maximum output from least inputs combination of their products and services. Apparently, the level of technical efficiency increases with the size of the SACCO. However, beyond a certain point, technical efficiency decreases due to diseconomies of scale and scope. Since the size of DT SACCOs is heterogeneous, then, different SACCOs enjoy different levels of economies of scale. Thus, DT SACCOs must increase their assets in terms of capital and reserves, deposits, investments and other asset related factors. Earlier studies indicate that larger SACCOs tend to be more profitable in spite of management complexity.

2.3 Empirical Literature Review

The researcher will review and analyse various relevant studies that have been conducted in the past. Through the reviews and analysis of such studies, the researcher will be able to identify the existing gaps, discuss how to address and subsequently how to fill them. The results will be summarized in a table.

2.3.1 Asset Quality and financial Performance

Anyike and Nwosi, (2015) investigated how profitability of the quoted commercial banks in Nigeria was affected by the asset quality. To achieve this, the researchers sampled fifteen quoted commercial banks and used the CAMEL criteria. The time scope was 1980-2013. The study utilised secondary time series data sourced from annual financial reports of the quoted commercial banks were collected. Financial

performance was computed using return on investment (ROI), while multiple regression was used to perform data analysis. In conclusion, the study found that there was a significant negative relationship that existed between asset quality and profitability. The study recommended bank lending environment to be well examined before and after credit. The study also recommends regulatory authorities to ensure that there exists a sound bank lending environment to lower NPLs which enhance profitability of commercial banks.

Knowledge gap exists since the study used a single variable to test its effect on profitability. There were several variables that the study failed to consider that may affect financial performance besides asset quality. It is therefore a misconception that asset quality can be singled out as the only variable that affects financial performance. The study ought to have included other variables such as capital adequacy and liquidity to make generalization. Again, there existed a period gap. The time covered by the research was very wide, spreading into thirty-three years. This meant that the problem which the researcher intended to address could have already been addressed by other researchers or could be overtaken by time, and there was a new problem existing by then. Contextual gap existed since the research focused on the listed commercial banks which are quite distinct from the DT SACCOs. The two institutions are in different countries geographically with different economies and different government policies. A geographical gap existed since the study was conducted in Nigeria while the current study will be conducted in Kenya.

The research made use of time series data to carry out analysis. The nature of time series data has drawbacks when coming up with a precise and accurate model to describe the data. In addition, generalization of one study becomes complicated due to problems associated with acquiring accurate and suitable measures. The current research will employ panel data that combine both cross section and time aspects thereby providing more information, more variability, and more efficiency and can detect more statistical effects. The multiple regressions used in the study presents a methodological gap because multiple regressions analysis has weakness of producing incorrect standard errors due to an inefficient model. ROI, the parameter that was used to measure financial performance is not applicable in DT SACCOs. This is because the regulator of DT SACCOs has set a ceiling that restricts the level up to which these financial institutions can invest in relation to the total assets they control. The current study will consequently use ROA as the measure of financial performance.

Barus et al., (2017) undertook a study to investigate on how the financial performance of DT SACCOs' in Kenya was influenced by the asset quality. Primary and secondary data were collected for analysis from eighty-three DT SACCOs registered by SASRA and operating by then. A census study was conducted where all the eighty-three SACCOs in the target population were included. The researchers exploited the explanatory research design to carry out the study. Results showed that there was a positive and significant relationship between financial performance and asset quality. Several gaps were however identified from the study. The study considered an incorrect target population because by 2012, a total number of one hundred and thirty-one DT SACCOs had been registered by SASRA under the CAMEL performance rating

framework (SASRA Report, 2012). By 2015, the number had risen to one hundred and seventy-seven registered DT SACCOs. This implies that the study left out a high percentage of SACCOs that were licensed and operational. By capturing an incorrect target population, it implies that the study subsequently collected incorrect data hence the findings were unreliable.

The researcher collected primary data using a questionnaire from customers on asset quality. This implies that the study did not collect financial data (quantitative) but rather relied on qualitative data from customers' opinion and/or experience. Such data presents a challenge in terms of accuracy and objectivity during data analysis and interpretation. Being a quantitative study, the study should have been guided by positivism philosophy because both the independent and the dependent variables are quantitatively measurable and the data is readily available from the SASRA database. Third, there exists a sampling gap because the study adopted a census study from a wrong target population of eighty-three DT SACCOs. This is incorrect because in 2015, there were one hundred and seventy-seven registered DT SACCOs that were operational.

Kadioglu et al., (2017) undertook a study on how asset quality affects the profitability of the banking sector in Turkey between 2005 and 2016. A sample of fifty-five banks was used in the study and panel regression method was applied. To measure profitability, both ROA and ROE were used, while NPLs was used to measure the asset quality. Results from analysis revealed that the two variables displayed a significant relationship that was negative in nature. Several studies have shown contrary findings as the one arrived at by the researcher (Barus et al., 2017e).

Both contextual and geographical gaps are identified because, despite the study being carried out in Turkey, the study focused on commercial banks. The current study will focus on DT SACCOs operating in Kenya. Commercial banks operating in Turkey engage quite a distinct economic environment away from that the DT SACCOs in Kenya operate. Besides the two institutions being in different countries geographically, the two financial institutions are regulated by different bodies, under different government policies. ROE exhibit several shortcomings since it can be manipulated to reflect the availed managerial incentives (Rongqiu & Haslinder, (2024). ROE can also conceal numerous problems as management may fall back to irregular financial strategies to show a healthy ROE for in the short run, concealing the deteriorating performance of the business principles (Almehdawe et al., 2020b). The current study will therefore measure financial performance using ROA since it has been found to be the most appropriate indicator for financial performance and generally recognised in finance literature.

Decrease in NPLs in financial institutions improves asset quality and profitability because it decreases loan loss provisions and the related loans recovery costs involved (Atichasari, Ratnasari, Kulsum, Kahpi, Wulandari & Marfu, 2023). While Adeghe et al., (2019c) found a negative and significant effect of asset quality on bank performance, Oduor (2020b) found that asset quality in commercial banks has a strong and positive effect on their financial performance. Additionally, Mutunga and Gatauwa (2021a) found that financial performance of SACCOs is affected by their asset quality in a positive way, and thus recommend DT SACCOs to minimize their NPLs to total loans ratio. On the contrary, Priharto and Gani (2024) observed that the relationship

between bank profitability and NPLs was negatively significant. The study explains that the increase in NPLs calls for more resources to be committed to provisions for loan loss and loan recovery costs.

2.3.2 Capital Adequacy and Financial Performance

Barus et al., (2017b) undertook a study on DT SACCOs in Kenya to explore how the financial performance of these SACCOs was affected by the capital adequacy. To conduct the study, explanatory research design was chosen, while the expense-preference behavior theory underpinned the study. Purposive sampling technique was conducted where eighty-three DT SACCOs were included. The researchers collected primary and secondary data cross-sectionally, which was then analyzed by employing multiple linear regression. From the analysis, it was concluded that the two variables had a significant and positive relationship. To exercise a significant degree of control over managers, the transaction costs incurred are too great to justify such efforts. That is why DT SACCOs have adopted the all-inclusive model of co-operation where the organizations are member owned. Thus, DT SACCOs are member-controlled entities, where the board members are elected amongst members and are involved in the running of the institutions. Again, DT SACCOs are prohibited by their regulator SASRA from engaging with non-members. Shareholders theory will therefore be adopted.

The study utilized cross-sectional data that has a weakness due to the limitation of examining the outcome and exposure at the same time because the temporal link between the two cannot be determined. Results derived from cross-sectional data show that, the disadvantages of such a study override the advantages. Though cross-sectional studies are relatively cheap and fast to conduct, they do not have the capability to

undertake causal inference. Again, in cross-sectional studies, the validity of results is highly dependent on whether the study sample is well representative of the population proposed to be studied, and whether all the individual measurements were made using an accurate and identical tool, or not. Thus, they are not capable of carrying out an analysis to determine whether an intervening variable or a moderating variable was the cause of an outcome simultaneously with the independent variable. Panel data will be used because its characteristics involve different cross-sectional data collected across time. This ensures that it contains more information, it is more variable, efficient, and has the higher ability to detect and measure statistical effects as compared to cross-sectional data.

Mbaeri et al., (2021) conducted a study to find out whether the financial performance of commercial banks operating in Nigeria was affected by the capital adequacy ratio (CAR). The study data were collected from the financial statements of the commercial banks and analysed using panel regression. The study was guided by the availability and consistency of data hence purposive sampling technique was preferred where a sample of thirteen banks was derived. Financial performance was measured by ROCE. The research was steered by the ex-post-facto research design. After analysis, results led to the conclusion that capital adequacy ratio and return on capital employed (ROCE) had a positive and significant relationship. The study recommended increase in capital adequacy ratio by central bank and ensure commercial banks complied with the regulation. Several gaps were identified as the study focused on the effect of a single independent variable to appraise the dependent variable. The independent variable should be unpacked into various variables in order to have a universal conclusion. The

use of a single independent variable deprives the study the capability of generalizability since capital adequacy ratio cannot solely be utilized to determine the financial performance of a SACCO.

Purposive sampling technique creates a methodological gap because by using the technique, the study cannot make generalizability due to the weakness of the sampling method. Purposive sampling technique generates an enormous display of inferential statistical approach that make the statistics invalid. With purposive sampling, the only inference possibilities apply to the specific group under the study and the sample relies on the personal judgement and interpretation of available data affecting the final result (Makwana, Engineer, Dabhi & Chudasama, 2023). The researcher therefore makes generalizations from certain samples to a broader population, bringing into question the validity and accuracy of the findings. Additionally, purposive sampling makes data prone to manipulation so as to suit the outcome, thus making the outcome more anticipated rather than unpredictable.

There is a geographical as well as a contextual gap is identified since two studies focused on two different forms of financial institutions operating in different countries. Fourth, a research design gap is found to exist because the ex-post facto research design adopted does not give the researcher a basis to define the association linking the two variables under investigation. Lack of randomness in selecting the sample and the variable will depend on researcher's interest. ROCE is used in measuring how efficiently capital is employed in the generation of revenue. The indicator cannot be applied in the current study because DT SACCOs are valued in terms of total assets

being controlled rather than total capital. Thus, the current study will measure financial performance using ROA.

Nyanyuki et al., (2022b) carried out a study to discover the relationship between the financial performance of commercial banks listed in Kenya and capital adequacy. While correlational research design guided the study, capital buffer theory underpinned the study. A sample was derived from a target population of forty-three listed commercial banks through application of purposive sampling technique. After analysis of data, results showed that the independent variable had a negative and significant effect on the dependent variable. From the study, several gaps were found to exist. There existed a research design gap following the adoption of correlation research design to guide the study. This research design has an inherent weakness in that, it can only uncover a relationship, though it does not have the capability to provide a conclusive reason as why the relationship occurs; neither can it reveal which variable influences the other. A correlation between two variables tells us very little other than that a relationship exists; it is very difficult to make accurate conclusions about the causes of the relationship. In correlation research, it is always possible that neither of the variables caused the other and that some other variable caused the observed variables to be correlated (Janse, Hoekstra, Jager, Zoccali, Tripepi, Dekker & Diepen, 2021). Thus, the current study will use explanatory research design.

The finding of the study contravened the findings of other studies. According to Adeghe et al., (2019), the independent variable has a positive and insignificant effect of on the dependent variable. Similarly, Barus et al., (2017) discovered that the

independent variable had a positive and significant effect on the dependent variable. Additionally, the study under review focused on two studies focus on commercial banks while the current study will focus on DT SACCOs, creating a contextual gap. Commercial banks and DT SACCOs operate under different business models where commercial banks are profit oriented and their customers are not necessarily their shareholders. On the other hand, DT SACCOs are member based and are prohibited by SASRA from doing business with non-members. Additionally, the two forms of financial institutions are regulated by different regulators, where commercial banks are regulated CBK while the DT SACCOs are regulated by SASRA. Such regulations define the limitations as well as the extension of each financial institution in carrying out their business. Besides, the study considered only one independent variable that affects financial performance thereby depriving the findings the capability of generalizability since capital adequacy cannot solely be utilized to determine the financial performance.

2.3.3 Liquidity and Financial Performance

Muheebwa (2018a) carried out a study of the SACCOs operating in Fort Portal in Uganda to establish whether their liquidity had a relationship with their financial performance. To carry the investigation, the researcher adopted modern portfolio theory to underpin the study while correlation research design directed on how to carry out the study. A sample of 19 SACCOs derived from a target population of one hundred and thirty-five SACCOs was utilized for the data analysis process. From the sample derived by conducting both simple random and stratified sampling technique, a questionnaire was used to collect data that was later analyzed using both inferential and descriptive

statistics. The conclusion from the findings was that, the relationship between liquidity and financial performance of the SACCOs under investigation was significant.

On carrying out analysis, several gaps were established. The study used modern portfolio theory which created a theoretical gap. This is because the theory applies in securities market where analysis between investment risk and reward is investigated in order to arrive at a desirable portfolio combination. Thus, the modern portfolio theory is misplaced when used in this context because the study was focusing on financial institutions and not securities market. By using the correlational research design to guide the study, the research design created a limitation of analytical capabilities for data analysis. Though the research design can indicate the significance in the relationship between variables, it does not have the capability to indicate the direction of the effect.

Correlation research design does not have the capability of indicating which variable influences the other; neither can it provide a conclusive reason as to why the relationship occurs. A correlation between two variables tells us very little other than that a relationship exists; it is very difficult to make accurate conclusions about the causes of the relationship. In correlation research, it is always possible that neither of the variables caused the other and that some other variable caused the observed variables to be correlated (Roemer, Tiny, Kitty, Carmine, Giovanni, Friedo & Merel, 2021).). Third, the study focused on SACCOs operating in Uganda while the current study will focus on SACCOs operating in Kenya, creating a contextual gap. The two studies were conducted in two different countries operating in different economic

environments. On the other hand, these two financial institutions are regulated by different regulators.

Gweyi et al., (2018a) undertook a study on DT SACCOs licensed and operating in Kenya 2011 – 2016 to evaluate whether their financial performance was influenced by liquidity risk. The researcher collected secondary panel data from a sample size of one hundred and thirty-five DT SACCOs. The sample was derived from a target population of one hundred and sixty-four SACCOs. After collection of data, the researcher utilized both descriptive and inferential statistics for the data analysis process. From the results, liquidity risk was found to exhibit a negative and significant influence on the financial performance. Several research gaps can be identified in the study. First, though the researcher claims to have conducted a census study on the one hundred and sixty-four DT SACCOs, it can be observed from the study that the researcher used balanced panel data from one hundred and thirty-five DT SACCOs. This means that the study used purposive sampling which creates a gap because the purposive sampling cannot be used to generalize findings. Second, the study focused on liquidity risk which reflects on the failure of a financial institution in honoring its financial commitments when they become due. The study seems to have chosen a rather obvious result since the presence of liquidity risk will definitely diminish the financial performance of any SACCO thus giving a negative effect.

From the choice of the independent variable, which is the liquidity risk, the results could be anticipated as opposed to the fact that the results should be unpredictable. It is for this reason that the current study will focus on liquidity as opposed to liquidity risk.

The effect of liquidity on financial performance cannot be predetermined unless an analysis of collected data is carried out to determine the results. Third, by adopting descriptive research design, a research gap occurred. This is because despite the descriptive research design having the capability of making future forecasts; it is considered too basic or premature since it carries investigations without manipulating any of the variables of the phenomenon. This limits the study to their measurement and description.

Kariuki et al., (2021) investigated on the financial performance of insurance companies operating in Kenya 2004-2018 to assess whether it was influenced by their liquidity. The study considered a target population of fifty-three insurance companies. This was a longitudinal study as panel data was collected and correlational research design guided the study. Liquidity was measured by current ratio (CR) while financial performance was unpacked into ROA and ROA. After analysis of the collected data, the study concluded that the independent variable had a positive and significant effect on the dependent variable. The study was found to have various gaps. Correlational research design cannot prove causation between the variables neither does it indicate which variable becomes the cause of the statistical pattern. Thus, it does not provide a conclusive reason why connection between variables exists; neither can it produce information regarding which variable is responsible for influencing the other. A correlation between two variables tells us very little other than that a relationship exists; it is very difficult to make accurate conclusions about the causes of the relationship. In correlation research, it is possible that neither of the variables caused the other and that some other variable caused the observed variables to be correlated (Negri, 2023).

ROA in the study was measured by current ratio (CR), which cannot be applied to DT SACCOs due to their financial reporting framework. Since current ratio derived by dividing current assets by current liabilities, such a ratio will not be suitable to SACCOs and in its place, liquidity ratio is used. The two ratios indicate the level of financial health in settling of debts. On the other hand, insurance companies and DT SACCOs operate in different environments where insurance companies are regulated by IRA while DT SACCOs are regulated by SASRA. DT SACCOs take deposits from members and give back loans to them while insurance companies invest the premium money, where they receive funds for the long-term in anticipation that they will be in a position to meet their liabilities by paying back their clients as the premiums materialize. Liquidity was measured by current ratio while the current study will measure liquidity by total deposits to total loans.

2.3.4 Financial stability, firm size and financial performance

In their study, Kirimi et al., (2022) studied on commercial banks operating in Kenya to investigate whether their financial performance had any association with their financial soundness. The study introduced bank size as a moderating variable to analyze whether it had any influence on either the direction or the magnitude of the relationship between the independent and dependent variables. To conduct the study, panel data was collected and analyzed using a panel data model. Financial soundness was unpacked into four indicators namely; capital adequacy, liquidity, asset quality and earning quality and each was tested to evaluate its effect on financial performance. ROA was utilized to evaluate financial performance. The findings from analysis established that when bank size is introduced in the relationship between financial soundness and

financial performance, it generally produced a negative moderation effect. On the other hand, it was observed that the moderating variable had a positive moderating effect on the association between three of the independent variables namely; asset quality, capital adequacy, and earning quality with the dependent variable, ROA. On the contrary, the moderating variable, bank size, was found to have a negative moderating effect on the association between liquidity and ROA.

By using return on assets (ROA) to measure financial performance, the study used the most appropriate indicator for financial performance which is generally recognized in finance literature. The researcher collected panel data and analysed it using panel data regression, which is generally recommended for longitudinal studies as it combines both the time series and cross-sectional data. The results were found to generally agree with many studies. However, there exists a contextual gap since the two studies focus on different forms of financial institutions, with the former taking on commercial banks, and with the current study taking on DT SACCOs. However, both studies concentrate their studies in Kenya. Commercial banks are regulated by the CBK, and their customers are generally being non-members since they do not hold any shares. Again, most banks are generally located in the urban areas, where the population is financially empowered. On the contrary, many DT SACCOs are member based and are regulated by SASRA. Again, most of these DT SACCOs have their genesis in the rural areas and are affiliated to a certain sector in the economy like agriculture or employment. Additionally, while the study under review introduced bank size as the moderating variable, the current study will introduce technical efficiency as a moderating variable.

Otwoko et al., (2021) purposed to examine whether the association existing between the financial performance of these SACCOs and the interest rate drivers' variability was being moderated by the size of these SACCOs. The researcher collected secondary data for analysis from a sample of seventy-four DT SACCOs, where the sample was derived from a target population of 176 DT SACCOs using Krejcie and Morgan formula. The study was directed by descriptive survey research design. To carry out data analysis, the study exploited descriptive and inferential statistics, after which, it was concluded that there subsists a positive and significant moderating effect of the SACCO size in the association linking the independent and the dependent variable. The study recommended that SACCOs' financial performance can be enhanced by increasing on their size to enjoy economies of scale.

The Krejcie and Morgan formula used to derive the sample size is not appropriate A sampling gap is evident because. Memon (2020) advices that Krejcie and Morgan method should be used to determine sample size when probability sampling (such as simple random, systematic, stratified) is the appropriate choice and advises that studies that intend to use non-probabilistic sampling techniques (e.g., purposive, snowball, quota) may consider other options to determine sample size. The study under review considered interest rate drivers as the predictor while in the current study, financial stability will be the predictor variable. Majorly, DT SACCOs are not affected by interest rate drivers because they only deal with local currencies and never trade in foreign currencies. Furthermore, DT SACCOs do not act as clearing houses for cheques and cannot directly access the national payment system. DT SACCOs take their cheques to banks for clearing. The descriptive research design adopted, though it can

make future forecasts, it is considered too basic or premature because it carries investigations without altering or manipulating any of the variables of the phenomenon. Moreover, it does not answer questions about how/when/why the characteristics occurred, and thus it limits the study to their measurement and description.

2.3.5 Financial stability, Technical Efficiency and financial performance

Kimutai *et al.*, (2019) explored on whether the efficiency of DT SACCOs in Kenya was affected by their financial soundness. The study covered 2012-2016 period and considered a target population of 110 DT SACCOs. A document review guide was used to collect financial data in panel form, while explanatory research design was adopted to conduct the study. To generate efficiency scores, the researcher applied DEA methodology. Results from the analysis show that the efficiency of DT SACCOs was negatively and significantly affected by both asset quality and liquidity while at the same time, efficiency was positively and significantly affected by capital adequacy. However, the study found that efficiency in DT SACCOs was affected in an insignificant and negative way by earning rating.

By concluding that the efficiency in DT SACCOs was negatively and significantly affected by asset quality contradicts many studies. Barus *et al.*, (2017); Chol *et al.*, (2019); Mutunga and Gatauwa, (2021) found contradicting findings to the study. Again, the finding that liquidity has a negative and significant relationship with efficiency also contradicts many studies. These include Barus *et al.*, (2017); Muheebwa (2018); Irungu (2019) and Kariuki *et al.*, (2021). Thus, the result from the study calls for further investigation. While the study under review included technical efficiency as the dependent variable, the current study will consider technical efficiency as a moderating

variable. Again, the study ignored to consider technical efficiency as a variable that influences output, but instead considered it as an output. In general, the shareholder is more concerned about the output rather than the process. Thus, to improve on the output, the process comes in. To fill the gap, this study will consider technical efficiency as a moderating variable and then it will be evaluated whether it has any effect on the relationship between the dependent variable, (financial performance) and the independent variable, (financial stability).

Teimet (2021) scrutinized the association between revenue diversification and financial performance while introducing size of the bank as a moderating variable and technical efficiency as a mediating variable. To carry out the study, a target population of forty-two commercial banks operating in Kenya was studied, where unbalanced panel data were collected for a period of ten years, 2009 to 2018. Financial performance was measured by ROA, while size was represented by a weighted composite index. On the other hand, technical efficiency was measured using data envelopment analysis. The mediating effect in the relationship between the two variables was assessed using panel least square regression. Resource based theory underpinned the study while longitudinal descriptive research design guided the study. From the cross-section random effects model, results reveal that there was a significant positive relationship between the dependent variable (financial performance) and the independent variable (revenue diversification). However, the study found the non-existence of mediating effect of technical efficiency in the relationship between ROA and revenue diversification.

Several gaps can be identified in the study. First, the study used both size and technical efficiency as moderating and mediating variable respectively, though technical efficiency could have been used to present the two variables. This is because technical efficiency absorbs the effects of size in the study. As an organization grows in size, it realizes the economies of scale, which enables it to diversify risks thereby enhancing managerial competence (Olweny & Shipho, 2011). This implies that the effect of size is reflected in technical efficiency and thus technical efficiency should not have been used as a mediating variable, rather than the moderating variable. Thus, in the current study, technical efficiency will be used as the moderating variable and will absorb size effects.

Second, the study under review concentrated on commercial banks which are more customers focused and are majorly non-members, different from DT SACCOs where every account holder must be a member. Commercial banks also operate using a different business model from DT SACCOs from that of commercial banks. On the other hand, banks and DT SACCOs are regulated by different regulators. Third, the researcher claims to have done a census study, but from analysis, the study excluded several banks that were in liquidation, receivership and under statutory management. The criterion that was used to eliminate these banks was not discussed in the study. This implies that not all the banks were considered and the criterion used to eliminate some of the banks should have been discussed. In the current study, the inclusion exclusion criterion will be applied.

Table 2.1: Summary of Literature and Research Gaps

Author	Focus	Findings	Research gaps	Addressing the gap
Anyike & Nwosi (2015)	Effect of asset quality on profitability of quoted commercial banks in Nigeria	Asset quality has significant effect on the profitability of commercial banks	<p>Multiple regression analysis conducted has weakness of producing incorrect standard errors hence inefficient model.</p> <p>Time series data was collected has drawbacks when coming up with a precise and accurate model, making generalization complicated</p> <p>Study focused on commercial banks which are quite distinct from the DT SACCOs.</p> <p>The study was conducted in Nigeria where the business environment is quite distinct from that in Kenya.</p> <p>Very wide study period of thirty-three years. Data evolution and change of landscape must have affected results in terms of relevance</p> <p>Asset quality was the only independent</p>	<p>Panel regression analysis was conducted</p> <p>Panel data were collected</p> <p>The study focused on DT SACCOs</p> <p>Study was undertaken in Kenya</p> <p>Five years period was considered</p> <p>Capital adequacy and</p>

			variable that was used. This narrowed the study and generalization.	Liquidity were included
Barus <i>et al.</i> , (2017)	The effect of asset quality on the financial performance of savings and credit societies in Kenya	A significant positive relationship exists between asset quality and financial performance of SACCOs.	Excluded many registered SACCOs while at the same time included SACCOs not licensed under CAMEL framework Collected qualitative primary data that might lead to challenges when it comes to analysis of data on the basis of accuracy and objectivity Adopted census study yet the target population was 83. Thus, it ended with a wrong sample, since all SACCO were not included in the sample	Considered SACCOs registered under CAMEL framework Collected quantitative secondary data Inclusion-exclusion criteria to capture all relevant data
Kadioglu, <i>et al.</i> , (2017)	Association between asset quality and profitability of commercial banks operating	There exists a significant negative association between NPLs and profitability	The study viewed asset quality and NPLs as one and same thing, though NPLs negatively affects asset quality though the converse is not true. The study was conducted in Turkey which is	Asset quality was measured by NPLs versus total gross loans Study was conducted

	in Turkey		a different environment from Kenya.	in Kenya
Barus <i>et al.</i> , (2017)	Capital adequacy and its relationship with the financial performance of DT SACCOs in Kenya	A significant positive relationship exists between capital adequacy and financial performance	Expense-preference behavior theory employed insists on separation of ownership from control where the transaction costs are incurred to exercise a significant degree of control over managers. The study considered one variable only, i.e. capital adequacy, which deprives the analysis the capability of generalizability Cross-sectional data used has a limitation of examining the outcome and exposure at the same time because of the temporal link between the two that cannot be determined.	Efficiency structure theory was employed since it is relevant to the study Asset quality, capital adequacy and liquidity were considered Panel data was used
Mbaeriet <i>al.</i> , (2021)	Financial performance of listed commercial banks in Nigeria is affected by capital adequacy	CAR has a significant and positive effect ROCE of commercial banks that are listed in Nigeria.	By using purposive sampling, the study cannot make generalizability due to the weakness of the sampling method The ex-post facto research design adopted does not give a basis to define the relationship between variables	Inclusion-exclusion criteria were used for sampling Explanatory research design was used

	ratio (CAR)		<p>The study centered on the listed commercial banks operating in Nigeria that are operated in different environment from DT SACCOs in Kenya</p> <p>ROCE was used to measure financial performance. However, the measure cannot be applied in SACCOs. SACCOs are valued in terms of total assets rather than capital employed.</p>	<p>Study focused on the DT SACCOs operating in Kenya</p> <p>ROA was used to measure financial performance</p>
Nyanyuki <i>et al.</i> , (2022)	Relationship existing between Capital adequacy and financial performance of commercial banks in Kenya	There exists a significant negative effect of capital adequacy on financial performance	<p>Correlation research design used only uncovers a relationship but does not provide a conclusive reason as to why the relationship occurs; does not reveal which variable influences the other.</p> <p>Conclusion that there exists negative significant relationship between capital adequacy and financial performance contradicts other many studies and theories.</p>	<p>Explanatory research design was used</p> <p>Effect of capital adequacy financial health will be evaluated.</p> <p>DT SACCOs</p>

			The study focused on commercial banks which are more business focused and regulated by the CBK	operating in Kenya
Muheebwa (2018)	Does the financial performance of SACCOs in Fort Portal in Uganda have a relationship with liquidity	There is a significant relationship between financial performance and liquidity of SACCOs in Fort Portal in Uganda	Modern portfolio theory applied should be applied in securities market since it attempts to balance investment risk and reward. Correlational research design used only uncovers the significance in the relationship between variables but does not show the direction of the effect of the variable that influences the other nor does it provide a conclusive reason why the relationship occurs; it is very difficult to make accurate conclusions about the causes of the relationship. The previous study focused on non-DT SACCOs operating in Uganda	Relevant theories were applied such as Buffer, Liquidity Shiftability Theories Explanatory research design was used since the study considers other relevant prior studies The study focused on DT SACCOs operating in Kenya
Gweyi <i>et al.</i> , (2018)	To determine how financial performance of DT SACCOs in	Financial performance of DT SACCOs in Kenya is influenced in a	The study used purposive sampling to come up with a sample. A sampling gap exists because the purposive sampling cannot be used to generalize findings	Sample was derived by using the inclusion-exclusion criteria

	Kenya is influenced by liquidity risk	negative and significant way by liquidity risk	Descriptive research design adopted is too basic or premature because it carries investigations without altering or manipulating any of the variables of the phenomenon which limits the study to their measurement and description. Focused on liquidity risk whose effect can be predicted since its presence automatically affects financial performance in a negative effect way	Explanatory research design was used since the study considers other relevant prior studies Focused on liquidity whose effect cannot be predicted
Kariuki <i>et al.</i> , (2021)	An examination of how financial performance of insurance companies in Kenya is influenced by liquidity.	There is a significant positive effect of liquidity on financial performance	Correlational research design adopted does not establish the cause and effect between the variables neither does it indicate which variable becomes the cause of the statistical pattern. ROA was measured by the current ratio which cannot be applied to DT SACCOs due to their financial reporting framework Focused on insurance companies that use	Explanatory research design was used due to its nature ROA will be used to measure financial performance The study focused on DT SACCOs

			different business models from DT SACCOs. Again, insurance companies are regulated by IRA while DT SACCOs are regulated by SASRA.	
Otwoko <i>et al.</i> , (2021)	Exploration on the effect of size as a moderating variable in the relationship between interest rate drivers and the financial performance of DT SACCOs in Kenya	The relationship between interest rate drivers and the financial performance of DT SACCOs is positively moderated by size	The calculations in Krejcie and Morgan table used to calculate sample size do not take into account statistical power and effect size. Again, the approach does not discuss directly on the significant level and sampling error Descriptive research design adopted is too basic and carries investigations without manipulating any of the variables of the phenomenon; it does not answer questions about how/why the characteristics occurred, thus limiting the study to their measurement and description.	Inclusion-exclusion criteria were used Explanatory research design was used
Kirimi <i>et al.</i> , (2022)	Moderating effect of bank size between financial soundness and	Negative moderating effect of bank size was found to exist in the relationship between the two	Cross sectional data used does not establish cause effect relationship or analyze a behavior over a period of time. The study focused on commercial banks	Panel data regression model was used Study focused on DT

	financial performance of commercial banks in Kenya	variables	which are more business focused and operate under the CBK while SACCOs are member based and are regulated under SASRA. The two financial institutions also apply different business models	SACCOs
Kimutai <i>et al.</i> , (2019)	Effect of financial soundness efficiency of DT SACCOs in Kenya	Existence of significant negative effect of asset quality and liquidity on efficiency, significant positive effect of liquidity on efficiency and insignificant negative effect of asset quality on efficiency	Conclusion that liquidity has negative and significant effect on efficiency contradicts many studies. The study analyzed efficiency as the dependent variable and did not consider that efficiency determines result i.e. determines the output	Tests were carried out to analyze the relationship between liquidity and efficiency. Efficiency was used as a moderating variable to test its effect on the relationship between the two variables
Teimet (2020)	An investigation on how financial performance is influenced by revenue diversification	Revenue diversification has positive and significant influence on financial performance	The study used size and technical efficiency as moderating and mediating variables respectively. However, technical efficiency absorbs the effect of size in the study. Descriptive research design adopted is too	Technical efficiency was used as the moderating variable Explanatory research

			<p>basic and carries investigations without manipulating any of the variables of the phenomenon. Again, it does not answer questions about how/why the characteristics occurred, thus limiting the study to their measurement and description.</p> <p>The study focused on commercial banks that are more business focused while SACCOs are member based. Again, their regulators and business models are quite different.</p> <p>The study claims to have done a census study, but from analysis, several banks that were in liquidation, receivership and under statutory management were excluded. The criterion that was used to eliminate these banks was not discussed in the study</p>	<p>design was used</p> <p>Study focused on DT SACCOs</p> <p>The study applied inclusion-exclusion criterion to come up with the sample</p>
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Source: Researcher (2025)

2.4 Conceptual Framework

The conceptual framework reflected a thorough understanding of the research problem with the purpose of the study to make the research findings relevant and generalizable (Luft, Jeong, Idsardi, Gardner, & Nehm, 2022). It presented the researcher's predetermined thinking in solving the existing problem and was an amalgamation of connected components and variables that assisted in unravelling a real-world problem (Salawu, Shamsuddin, Bolatitio, & Masibo, 2023). The usage of processes, procedures, functional approach, models, and theories were used for problem resolution (Zackoff, Real, Klein, Abramson, Li, & Gusic, 2019). The conceptual framework illustrated how the prevailing circumstances under investigation, together with the underlying factors to the study's hypothesis are brought out (Van der Waldt, 2024).

Prudential regulation was unpacked into asset quality, capital adequacy and liquidity. Asset quality was measured by dividing NPLs by the total gross loans while liquidity was measured by total deposits divided by total loans. Capital adequacy on the other hand was measured by dividing core capital by the total assets. Financial health, the dependent variable was quantified by ROA and measured by dividing EBIT by the total assets. Technical efficiency, the moderating variable was measured using DEA index. The three independent variables were combined into a single panel regression model which was run to generate output that reflected the significant effect of each variable on financial performance. The findings guided decision making, generalization and prediction of future trends (Upadhyaya & Navaraj, 2020). The study conceptualization was anchored on the likelihood of financial health outcomes that were associated with distortion of each of the variables of prudential regulation. The conceptualization

further recognized technical efficiency as a moderator between financial stability and financial health. The conceptual framework was presented in Figure 2.1 below.

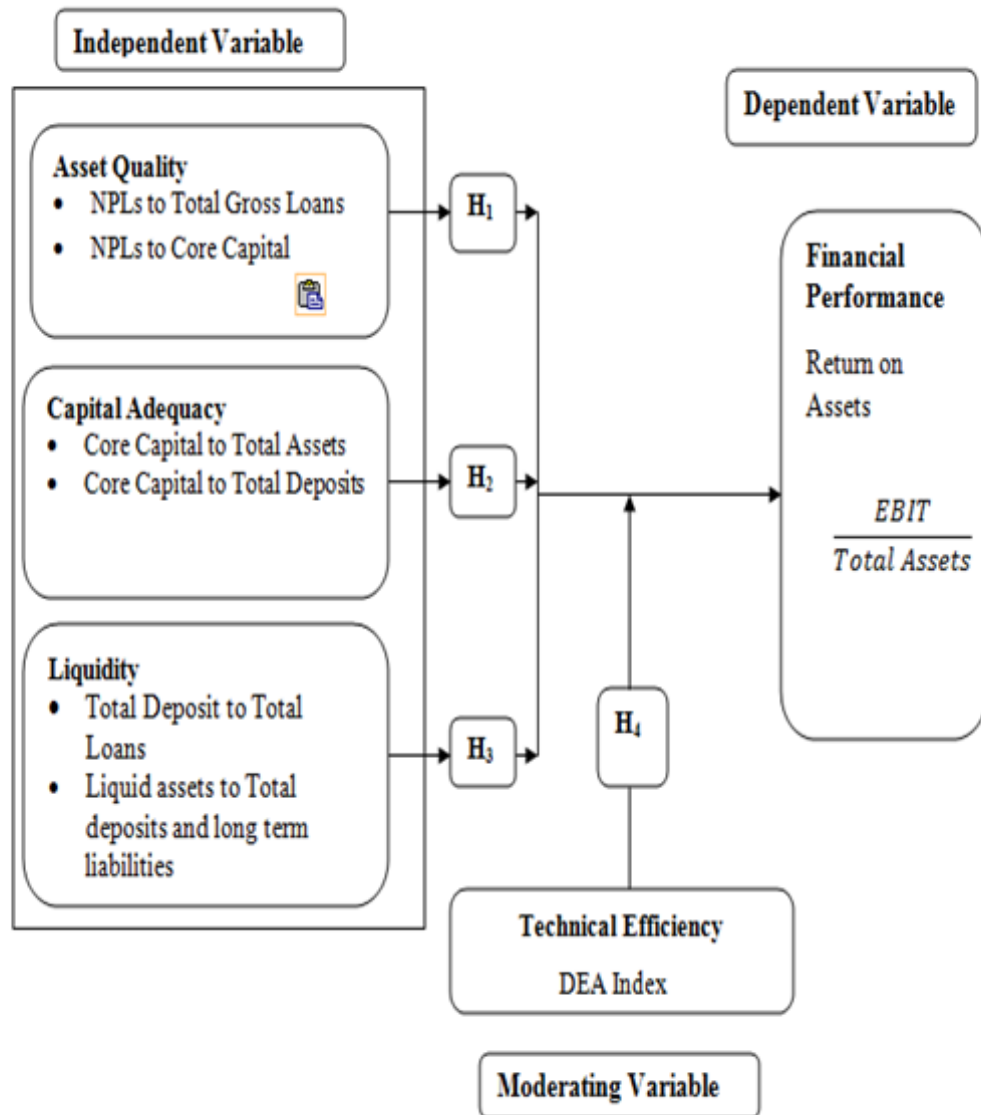


Figure 2.1: Conceptual Framework

Source: Researcher (2025)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter provided the study methodology where explanations and descriptions of the methods and procedures applied in conducting the study were discussed. The chapter identified the research philosophy to be adopted in the development of knowledge, the research design that guided the research work and the empirical model that was adopted to test the relationships between the variables. Additionally, the chapter presented how variables were operationalized and measured, besides discussing the data collection process and the instruments that were used.

3.2 Research Philosophy

Research philosophy captures the nature of knowledge to be developed, taking into consideration the nature of the impending phenomenon and give guidance to scientific discoveries through assumptions and principles (Gannon, Taheri, & Azer 2022; Park, Konge & Artino, 2020). It is a blueprint guiding execution of a study and assesses various methodologies to be adopted a postulation relating to the procedure in which the data associated to a subject matter under investigation is collected, analyzed and later consumed (Žukauskas, Vveinhardt, & Andriukaitienė, 2018; Khan, Raman, Sambamoorthy, & Prashanth, 2023). The three main research philosophies are utilized by researchers in the collection, analyzing, developing and comprehension of knowledge in relation to an area of study and include positivism, interpretivism and

realism (Kirongo & Odoyo, 2020). The nature of data collected and the process of data analysis involved guide in the choice of philosophy (Matta, 2021).

The study adopted positivism philosophy because the philosophy is a hypothetico-deductive method that aims at verifying priori hypotheses that are often stated quantitatively, and the relationships are derived between the independent and dependent variables (Park, Konge & Artino, 2020). Positivist research is associated with the testing of hypotheses beginning with theory from literature beginning by building testable hypotheses, design an experiment through operationalizing variables and conducting an empirical study (Park *et al.*, 2020). Tested hypotheses discovered new laws in relation to the theories that have been established which supported positivism philosophy. The study involved observable and independent entities, that exist externally in social reality, and whose objectives and quantifiable observations allow for law like generalization (Park *et al.*, 2020). Positivism exhibits a deterministic approach due to its scientific nature (Maksimović, & Evtimov, 2023). Scientific methods and measurable facts were implied in the study to produce factual and trustworthy knowledge that are developed and generalized in a form of law (Breuer, Laro, Sapra, & Zakolyukina, 2024). By retaining a distinct disconnect between facts and values, positivists trust that research can earn comprehensive facts that are relevant across different contexts (Maksimović & Evtimov, 2023).

Positivist paradigm is based on the assumption that a single tangible reality exists, one that can be understood, identified, and measured (Pretorius, 2024). DT SACCOs are observable, independent entities that exist externally in social reality. Positivist

paradigm was adopted because of the theoretical framework and conceptual model of investigation that were created from hypotheses and the paradigm that entailed operationalization of variables and measurement (Haucke, Hoekstra, Van Ravenzwaaij, 2021). According to Junjie and Yingxin (2022), positivism orientation places a researcher in a natural and deep-thinking position, where the principle of natural science is apprehended to operate in dualism and objectivism (Park *et al.*, 2020). Positivism relies heavily on objectivity, dismissing the importance of individuals' subjective experiences and values. The researcher stays objective and does not interact with participants during data collection (Mozersky, Parsons, Walsh, Baldwin, McIntosh, DuBois, 2020). To appropriately develop truth, absolute separation must exist between the research participant and the researcher (Busetto, Wolfgang & Gumbinger, 2020).

3.3 Research Design

A research design facilitates efficiency of a research to make it possible to yield maximum information (Tegan, 2021). It is a comprehensive plan that directs the research work and the approach taken in order to answer the prevailing research questions, painting the bigger picture of the entire roadmap, and identifying the procedure to be carried out in the collection and analyzing of data (Sileyew, 2020; Khanday & Khanam, 2023). According to Pawar (2020), there are three main classifications of research, based on the research design adopted, namely exploratory, descriptive, and explanatory research designs. Exploratory research is executed when comprehending the rationale behind a phenomenon, without forming a predetermined hypothesis in mind. Exploratory research enquires into new or under-researched areas, delving into a subject that is under-examined, in order to generate break throughs (Khan

et al., 2023). Exploratory research focus on locating designs, subject matter, and prospects for deeper examination. Exploratory research commonly utilizes qualitative methods, though they can also include literature reviews as well as case studies (Saka, Osademe, & Ononokpono, 2023).

Descriptive research describes characteristics of a phenomenon, population, or situation, and focuses on furnishing a detailed account of what is being studied. The research utilizes surveys, observations, and statistical analysis. Explanatory research seeks to understand cause-and-effect relationships with an intention to demonstrate the relationships between variables and to understand why a certain phenomenon occurs. It concentrates on pinpointing the causal relationships and testing hypotheses where experiments, quasi-experiments, and statistical analysis are commonly utilized (Khan, Raman, Sambamoorthy, & Prashanth, 2023). The study therefore adopted explanatory research design because the study endeavored to understand the “why” and” how” behind the phenomenon occurring in the way it did (Asenahabi, 2019). To do this, the study investigated the relationships between the dependent and independent variables to establish cause-and-effect relationships between the study variables.

The study did not only allow the researcher to gain familiarity of the unknown, but it also allowed the study to replicate previous studies to give them greater depth and gain new insights (Ansari, Rahim, Bhoje, & Bhosale, 2022). There was the collection of structured quantitative secondary data with formulated hypotheses for testing the relationships between variables which qualified explanatory research design for the study (Kotronoulas, Miguel, Dowling, Fernández-Ortega, Colomer-Lahiguera,

Bağçivan, Pape, Drury, Semple, Dieperink & Papadopoulou, 2023). This called for the application of statistical methods in data analysis to understand the underlying reasons that caused the relationships behind the phenomenon (Mohaiminul, 2020). Relevant theories guided the study and also explained the expected relationships between variables (Eiko, 2020). The researcher was therefore conceptualised how the phenomenon conducted itself by recognizing the significant variables that activated a difference (Sardana, Shekoohi, Cornett, & Kaye, 2022). The researcher was therefore able to make informed decisions in terms of generalization and prediction of the population (Kotronoulas, Miguel, Dowling, Fernández-Ortega, Colomer-Lahiguera, Bağçivan, Pape, Drury, Semple, Dieperink, & Papadopoulou, 2023).

3.4 Empirical Model

Regression analysis was used in modeling, analyzing and establishing the cause-and-effect relationship of financial stability on financial health. Since panel data was collected, panel data regression was carried out. Panel data comprised of cross-sectional data that varies over time, thereby reducing biases by controlling variable omission (Baltagi, 2020; Grieser & Hadlock, 2019). Panel data has a major advantage of producing more degrees of freedom that are generated from a large sample (Zapf, Wiessner, & König, 2024). Large samples produce data that is highly variable with additional information, thereby reducing the multicollinearity variables, which minimizes biasness of the statistical estimators, while at the same time allowing for data triangulation (Kebalepile & Chakane, 2023). This increases the validity and reliability of results. Panel data regression accounts for the firms' specific attributes by controlling for unobserved time-invariant heterogeneity in cross-sectional models. Similarly, panel

regression analysis empowers the researcher to discover the statistical significance thereby providing evidence in relation to the plausibility of the null hypothesis (Baltagi, 2021).

There are three types of panel regression models namely; the pooled ordinary least squares (OLS), the fixed effects model (FEM) and the random effects model (REM) (Ceasay & Moussa, 2022). Pooled regression model was not appropriate for modeling the panel data because it disregards the effects of time series and cross-sectional data. By pooling different firms that are time invariant with different characteristics together, it meant that one pooled OLS estimation would have camouflaged the fixed effects, thereby resulting in heterogeneity, where the unobserved SACCOs' specific characteristics would be subsumed in the error term (Ceasay & Moussa, 2022). This would cause the estimated regression coefficients ($\hat{\beta}_i$) to be biased and inconsistent, a condition that would lead to erroneous inferences. Thus, either FEM or REM was to be adopted since they take into account of the unobserved heterogeneity. To decide on whether to adopt FEM or REM, Hausman test was conducted. The general empirical model will be adopted from Yang, Magazzino, Awosusi, & Abdulloev (2024); Erdogan (2024) and Iqbal & Fikri, (2025) as indicated below:

$$Y_{it} = \beta_0 + \beta_i X_{it} + \epsilon_{it} \dots\dots\dots 3.1$$

Equation 3.1 can be expanded to obtain equation 3.2

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \epsilon_{it} \dots\dots\dots 3.2$$

Where:

Y_{it} = Financial performance

X₁, X₂, X₃, X₄ = Asset quality, Capital adequacy, Liquidity, Technical efficiency respectively

i = cross section observations (1-159 DT SACCOs),

t = time period (t= 2018 – 2022),

β₀, β_i = beta coefficients,

ε_{it} = the error term.

Technical efficiency was introduced in the model as a third variable and tested for its moderating effect on the relationship between the independent and the dependent variable and to enhance understanding of the two variables. A moderated regression model was used to establish whether technical efficiency would produce change in magnitude and/or directional change (Memon, Cheah, Ramayah, Ting, Chuah, Cham, 2019). The moderation effect was analysed by adopting the two-step moderation test (Park, & Yi, 2022). Financial health was tested as an independent variable of the other dependent variables, together with technical efficiency. The moderator model 3.2 was estimated where the direction and significance of each variable in relation to financial performance was determined. The second step was to test the relationship between financial stability and financial health with technical efficiency as a moderator. This resulted in the additive model 3.3, in which the products of the additive components have been added (Whisman & McClelland, 2005). The moderation analysis was adopted by Kimutai *et al.*, (2019c).

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{4t} * X_{1t} + \beta_6 X_{4t} * X_{2t} + \beta_7 X_{4t} * X_{3t} + \epsilon_{it} \dots \dots \dots 3.3$$

Table 3.1 below represents the analysis outcomes of the scenario one and two of model 3.2 and 3.3 respectively. In model 3.2, technical efficiency is the explanatory variable while in model 3.3; technical efficiency is the moderating variable. If from model 3.2 the technical efficiency is found to be insignificant, then it can moderate the relationship. On the other hand, if in model 3.3 the technical efficiency is found to be significant, then it moderates the relationship.

Table 3.1: Criteria for Decision Making on Moderating Effect

Scenario	Analysis	Parameter	Model 3.2	Conclusion
Model 3.2	Technical efficiency as an explanatory variable	Coefficient of technical efficiency	Technical efficiency is insignificant	Technical efficiency can moderate the relationship between the independent and the dependent variable
Model 3.3	Technical efficiency as a moderating variable	Coefficient of technical efficiency	Technical efficiency is significant	Technical efficiency moderates between the relationship between the independent and the dependent variable

Source: Whisman and McClelland (2005)

3.5 Operationalization and measurements of variables

Operationalization involves turning abstract concepts into measurable observations. All variables in the study were operationalized, accompanied by their indicators and measurements. The study measure and operationalize the study variables as shown in Table 3.2 below.

Table 3.2: Operationalization and Measurements of Variables

Variable	Operationalization	Indicator	Measurement	Scale of Measurement
Prudential Regulation (Independent Variable)	Levels of prudential requirements for DT SACCOs set by the regulator SASRA to ensure that there is business continuity of financial intermediation	Capital Adequacy	$\frac{\textit{Core Capital}}{\textit{Total Assets}}$	Ratio
		Asset Quality	$\frac{\textit{NPL}}{\textit{Total Gross Loans}}$	Ratio
		Liquidity	$\frac{\textit{Total Deposits}}{\textit{Total Loans}}$	Ratio
Financial Health (Dependent variable)	How well available resources are utilized in the generation of revenue while at the same time controlling costs	Return on Assets	$\frac{\textit{Net Income}}{\textit{Total Assets}}$	Ratio
Technical Efficiency (Moderating Variable)	Ability to produce maximum possible output from given least inputs	Efficiency Score	$\frac{\textit{Inputs}}{\textit{Outputs}}$	Ratio

Source: Researcher (2023)

3.6 Target Population

A target population consists of a complete set of a group with specific characteristics, aggregating respondents extracted in an environment in which a researcher is interested (Willie, 2024). Mugenda and Mugenda (2003) assert that such a group should consist of individuals, objects or events that have common and noticeable characteristics. To

determine the target population, the researcher defined the specific attributes of the DT SACCOs to be studied, based on specific factors. The target population of the study output absolutely represented a larger population of interest (Ackerman, Schmid, Rudolph, Seamans, Susukida, Mojtabai, & Stuart, 2019). The researcher ensured that the characteristics of the target population were explicit and simply understandable to enable him establish the appropriateness of each SACCO for the study.

The target population was formed by the DT SACCOs operating in Kenya between 2018 and 2022 that the researcher wanted to study. To successfully come up with the target population, the researcher carefully examined all the factors that define the DT SACCOs boundaries, focusing on particular, finite but enough group to preclude any undesirable inclusions. The targeted population was a sub-set from the larger population of all the objects that the study was interested in (Dalowar, Zuraina & Nor Siah, 2023). The sampling frame was the created from the target population. From the target population, the researcher applied an appropriate sampling technique to derive the number that was used to carry out data analysis and to make generalization of the population. The target population consisted of 173 DT SACCOs is as presented in appendix II.

3.7 Sampling Technique

This is the technique that the researcher utilized to derive a sample. The study adopted purposive sampling technique where inclusion-exclusion criterion was applied to select the sample (Memon, Thurasamy, Ting & Jun-Hwa, 2025). The sampling technique was adopted because several DT SACCOs were deregistered between 2018 and 2022 while others were registered in the same period. Besides, there were some DT SACCOs

that were on and off business operations during this study period, thereby giving rise to incomplete data. The inclusion exclusion criterion was therefore relevant in selecting those DT SACCOs that were in continuous in business operation from the beginning of 2018 until the end of 2022. Those DT SACCOs that were registered in 2018, or closed operations before 2018 or were not in business for all the five years under consideration were excluded. This process maximized the internal and external validity of the study since the remaining DT SACCOs had complete data and were used for data analysis (Ahmed, 2024). This left the study with a sample size of 159 DT SACCOs.

3.8 Data Collection Instruments

Data was collected from the audited financial statements of all the DT SACCOs from the regulator, SASRA. Thus, these were secondary data that were sourced from the financial documents of the DT SACCOs. Collecting data from documents was advantageous because documents are manageable, and are practical sources that provide stable data that do not react to the number of times that the data is read or reviewed. Documents are considered stable source of data as they remain consistent and are not influenced by researchers or the research process (Pederson, Vingilis, Wickens, Koval, 2020). To extract the financial data from the financial statements, data extraction tools were used. The data collection tools assisted the researcher to gather information and later to assess the population's status with regard to one or more factors (Creswell, 2017). The data extraction sheets were formatted based on annual periods to ensure that correct and complete panel data were extracted for data analysis. The use of data extraction sheets in the data collection process hastened the process, besides making the

data analysis process uncomplicated. The format of data extraction sheets are presented in Appendix III Sheet one and Sheet two.

3.9 Data Collection Procedure

Collection data enabled the researcher to find answers to the research hypotheses and gained insights regarding the research topic (Taherdoost, 2021). There was need to collect relevant data as necessitated by the prevailing demand in order to develop predictive concepts because data collection process is informed by the theory (Broby, 2022; Dewi, 2021). The researcher applied for an authorization letter from the Graduate School of Kenyatta University to undertake the research. With the authorization letter, the researcher applied for a research permit from NACOSTI (Appendix IV). The researcher subsequently drafted a letter of introduction that was forwarded to SASRA, Old Mutual Towers, together with other university documents and NACOSTI research permit. This paved way for data collection process with SASRA permission. The researcher visited SASRA offices at Old Mutual Towers and collected financial data that related to variable of interest namely financial stability, financial performance and technical efficiency. The formatted data extraction sheets that were used to collect data are presented in Appendix II Sheet one and Appendix II Sheet two.

3.10 Diagnostic Tests

Several diagnostic tests were conducted before and after fitting the regression panel model. According to Baldwin, Pingault, Schoeler, Sallis, & Munafò, (2022), secondary data should be checked for potential errors and bias before being used in data analysis. Diagnostic tests were therefore necessary to ensure that the regression assumptions were not violated (Baldwin *et al.*, 2022). Violations of the regression assumptions

would produce biased estimators that are not BLUE, thereby resulting in inefficient and inconsistent estimates. Consequently, the confidence levels, significance tests and the relationships between the variables would have been affected (Washington, Karlaftis, Mannering, & Anastasopoulos, 2020). Biased estimators also produce estimates that are unequal to the true value within the population ($\bar{x} \neq \mu$ or $\hat{p} \neq p$). This would impact on the ability to trust results and to invalidly draw inferences about the results. The diagnostic tests that were executed ensured that no regression assumptions were violated. These included the test for normality, autocorrelation, unit root test, heteroscedasticity, multicollinearity, and Hausman test (Verhagen, & Hancock, 2021).

3.10.1 Normality Test

The test was performed prior to carrying out the regression analysis with an intention of certifying that the data followed a normal distribution. Normality implied symmetrical distribution characteristic that follow a bell-shaped curve. To carry out the test, the study employed Shapiro Wilk test (Mishra, Pandey, Singh, Gupta, Sahu, & Keshri, 2019). The null hypothesis suggested that the sample data was not significantly different from a population that was normally distributed, while the alternative hypothesis was that the sample data was significantly different from a population that was normally distributed. By calculating the p-value and comparing it with significance level of 0.05, rejection or failure to reject the null hypothesis was concluded under the following circumstances. In case the calculated p-value exceeded the significance level ($p > 0.05$), then, failure of rejection of the null hypothesis would follow. The conclusion would then be that; the distribution of the sample data was not significantly different from a normal distribution. However, if the calculated p-value would be below the

significant level ($p < .05$), then, the rejection of the null hypothesis would follow, with a conclusion that, the distribution was significantly different from a normal distribution. Shapiro-Wilk test can be used for any n in the range of $3 \leq n \leq 5000$.

3.10.2 Autocorrelation Test

The test was carried out to assess the presence of serial correlation in the panel data model. Wooldridge test was used to test the panel data model tested for presence of serial correlation in the error term which could affect the dependent variable due to unobserved factors. Woodridge test is quite robust, with good size and properties that are powerful, making it quite attractive for the serial correlation test in panel data models. Serial correlation should not be present in panel model because regressing a model with serially correlated data affects the standard errors, making the outcome less efficient due to the repetitive patterns in the data set. Null hypothesis assumed that in the panel data, first order correlation is absent, while the alternative hypothesis assumed that, in the panel data first order correlation is present. If the calculated p-value was found to be lower as compared to the significance level of 0.05, ($p < 0.05$), rejection of the null hypothesis would follow, with the conclusion that, first order correlation existed, thus, the residuals would serially correlate. On the contrary, if the p-value exceeded the significance level 0.05, ($p > .05$), failure of rejection of the null hypothesis will follow, with the conclusion that, no first order serial correlation exists; hence residuals are not serially correlated.

3.10.3 Stationarity Test

Stationarity of the primary data is paramount for a panel data model to be valid. The study will therefore undertake a stationarity test on the data in order to confirm that the

data is stationary. Since panel data is group of panels made up of several different panels that are linked with a combined fundamental element, the unit root test will be done jointly, rather than on the individual panels. Fisher-type test is preferred because it is non-parametric and demands for an exact test, including all the p-values of each statistic to derive the overall p-value. With the Fisher-type test, the study can test the heterogeneity using balanced or unbalanced data. The null hypothesis advocates that every panel contains a unit root, hence panels are not stationary, while the alternative hypothesis advocates for stationary panels. If the calculated p-values were found to be less than 0.05, ($p < .05$), the test would be significant to reject the null hypothesis and conclude that, panels were stationary. On the contrary if the test statistic were more than 0.05, ($p > .05$), the test would not be significant to reject of the null hypothesis with the with conclusion that, the panels are not stationary. Differenced variables would be used where any of the variables would be established to have a unit root, by adopting differencing and fit regression models.

3.10.4 Heteroscedasticity Test

To ensure that the homoscedasticity assumption was met before carrying out the regression analysis, heteroscedasticity test was carried out. This was to ensure that the residuals were spread with equal variance. Violation of the homoscedasticity assumption results in heteroscedasticity, whose presence renders the regression results undependable. This is because it produces parameter estimates that are biased, resulting in OLS estimators that are not BLUE. This gives rise to biasness in both the confidence intervals as well as the test statistics due to the biased standard errors. To scrutinize heteroscedasticity presence in the regression model, Breusch-Pagan test was used to test

if the figures of the independent variables impact on the variation of errors. The null hypothesis was the presence of homoscedasticity, while the alternative hypothesis was the presence of heteroscedasticity. If the calculated p-value was below the set level of significance of 0.05 ($p < .05$) rejection of the null hypothesis will follow, with a conclusion that, heteroscedasticity is presence in the regression model. Alternatively, failure to reject the null hypothesis will follow if the calculated p-value will exceed the level of significance of 0.05 ($p > .05$) and conclude there is presence of homoscedasticity in the regression model.

3.10.5 Multicollinearity Test

Multicollinearity arises when there is high level correlation between at least two independent variables, making the prediction of at least one the independent variables possible, and with high certainty. The existence of multicollinearity in a multiple regression cannot be disputed, but rather, it is a test for the severity in a regression analysis between the independent variables. According to (Kim, 2019), multicollinearity results in unreliable and unstable approximations of the regression coefficients since it is possible to forecast one or variables from other variables with conviction. Thus, by altering one variable in the model results in a change of another variable in the model, thereby fluctuating the model significantly. Multicollinearity problem affects fitting of the model and the interpretation of results because it limits the estimation of the relationship between each independent variable and the dependent variable using the model. As such, the statistical significance of independent variables is undermined, making it hard to recognise them. In the study, the presence of multicollinearity was tested using the Vector Inflation Factor (VIF) (Shrestha, 2020). A VIF of between 1 and

10 indicated acceptable level of multicollinearity and there is no threat of multicollinearity problem. When VIF surpasses 10, it will indicate an unacceptable level of multicollinearity and the researcher will remedy the condition by dropping some of the variables.

3.10.6 Model Specification Test

Before carrying out regression, it was ensured that there were no endogenous regressors present in the model. The existence of such regressors in the model will create correlation between the independent variable and the error term, thereby hindering the functionality of OLS estimators. Endogenous regressors in a model can even dictate the outcome of other independent variables. To detect the presence of endogenous regressors in the regression model, Hausman test will be conducted. Fixed effects do not allow variables to vary across time, implying that the error term is somehow associated with the predictor variables. On the other hand, random effects (RE) allow variables to vary across time, implying that the error term does not have any association with the predictor variables. The null hypothesis advocates that REM while the alternative hypothesis advocates for FEM. If the calculated p-value is lower than the set significance level of 0.05 ($p < .05$), rejection of the null hypothesis will follow, concluding that FEM is appropriate. On the other hand, if the calculated p-value will exceed the set significance level of 0.05 ($p > .05$) rejection of the null hypothesis will not be done; concluding that REM will not be the best model to use and thus, the study will use FEM.

3.11 Data Analysis and Presentation

Statistical inference was carried out to analyze the collected data. This comprised of both descriptive statistics and inferential analysis. Descriptive statistics described the basic characteristics and summarized the data for interpretation of the general trend and frequencies (Guetterman, 2019). Descriptive statistics also described the characteristics of data in terms of distribution, central tendency and validity or dispersion. Inferential analysis included hypotheses testing and regression analysis and was utilised in testing significant relationships between variables, and making predictions beyond the immediate dataset. Finally, inferential statistics helped in decision-making by providing evidence-based insights into population characteristics and relationships (Ogundipe & Omoyeni, 2023). Data were summarized by using tables.

A unit of analysis defines individuals from whom study data are collected in order to understand a phenomenon and to provide a conclusion by testing the research hypotheses (Khan, 2021). In this case the unit of analysis of the study were all the DT SACCO in the subsector in Kenya. This meant that no other form of SACCOs were considered, thereby setting boundaries on what to be studied and not to be studied (Ritella *et al.*, 2020). Unit of analysis directly affected research methodology and helped in the design of the way research was conducted, which ultimately affected the data collection tools (Damşa & Jornet, 2020). A unit of observation is the source of data and the specific entity from which data is collected and observed. This can be individuals, groups, organizations, events, or other relevant elements. The unit of observation is crucial because it determines the level at which data is gathered, and influences research design, data collection methods, and analysis techniques. Besides, it

ensures that the data gathered are suitable for answering the carry out research hypotheses. In the study, the unit of observation was the DT SACCOs from which data were extracted for analysis.

3.12 Ethical Consideration

The researcher observed ethical standards throughout the research process (Ali, Okeke, Obiorah, Ugah, Omatseyione, & Ogheneteme, 2025). These included integrity, informed consent, confidentiality, privacy and plagiarism. Honesty and transparency were also observed in the application of concepts and practices that governed the research design. Ethical standards ensured that the maintenance and enhancement of academic integrity, credibility and reliability in the entire work was achieved. Caution was taken not to violate the rights of organizations or cause harm to them throughout the study process. Thus, the study was guided by a code of conduct and standard behavior which reflected the researcher's connection in terms of noble choices with other individuals and organisations. Informed consent was attained by informing SASRA about the intended study by sending a letter of introduction detailing the topic of the study and a research permit from NACOSTI, to UAP Old Mutual Towers, requesting to allow for data collection for the study. Integrity was maintained by ensuring that the collected data was not distorted before or during data analysis to avoid data falsification and academic fraud. This would result in misrepresented results, leading to failure in upholding research validity. The research work was free from plagiarism where the researcher acknowledged other researchers' academic work through citation. The findings of the study were ultimately shared with NACOSTI.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The chapter presented the study findings as well as interpretations from the collected data. The collected data were analyzed and expounded in relation to the independent variable, the dependent variable and the moderating variable. To carry out data analysis, statistical analyses that included both descriptive statistics as well as inferential statistics were conducted. Descriptive statistics included variability, dispersion and central tendency and facilitated summarizing of data characteristics in form of tables, charts and graphs. On the other hand, inferential statistics included hypothesis testing and panel regression analysis and supported in the drawing of conclusions on the relationship between the variables. Besides inferential statistics facilitated the derivation of generalizability of the sample data to the population and making predictions. The findings of the study were interpreted in relation to the study objectives and hypotheses and were compared with the existing literature.

4.2 Sample Size

The target population for the study was one hundred and seventy-six DT SACCOs. After the data collection exercise, complete data was available from 159 DT SACCOs which represented 90.9 percent. Data from sixteen SACCOs were not complete and therefore could not be used for panel data analysis. This is because some SACCOs were deregistered between 2018 and 2022 while others were registered during the same period. Besides, there were some DT SACCOs that were on and off business operations

during this period, thereby giving rise to incomplete data. The inclusion-exclusion criteria used selected that DT SACCO that were in continuous operation between 2018 through 2022. According to Sataloff, and Swetha (2021), a response rate above 70 percent is very good. Having a sample representing 90.9 percent of the population in the study was considered sufficient as well as satisfactory in carrying out the data analysis exercise and for the making of conclusions as well as the generalizations from the study that were based on the objectives.

4.3 Descriptive Analysis

Descriptive analysis involves summarization and description of the major characteristics of a dataset as well as measures of central tendency (i.e. mean, median, mode) and measures of variability (i.e. standard deviation, variance). Descriptive analysis provides a brief summary of the data, featuring patterns, trends, and key attributes (Wolniak, 2023). The descriptive analysis section focusses on the results that are derived on carrying out the descriptive statistics of all the variables in the study to understand their distribution. Measures of central tendency represent the typical value in a dataset, where mean presents the average of all values, with the median showing the middle value when data is ordered, while mode presents the most frequent value. The measures of variability outlined how data was spread out, with standard deviation showing the average distance of each data point from the mean and variance showing the average of the squared differences from the mean. Descriptive analysis provided a clear and concise overview of the data, helping to identify patterns and trends, thereby facilitating communication of findings to a broader audience and set the stage for further analysis (Yellapu, 2018).

4.3.1 Descriptive Analysis of All Variables

The following table presents the results from the descriptive analysis.

Table 4.1: Descriptive Analysis of All Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	795	.023084	.005745	.0081	.0394
AQ	795	.1163678	.037246	.0121	.2537
CA	795	.2256951	.081213	.0315	.5005
LQ	795	.2263332	.07484	.0402	.4589
TE	795	.7397837	.0764077	.5137	.9608

From Table 4.1 ROA had a mean of 0.023084 or 2.30 percent, a standard deviation of 0.005745 with a minimum value of 0.0081 and a maximum value of 0.0394. This implies that data was clustered very close to the mean. Asset quality had a mean of 0.11636 or 11.63 percent and a standard deviation of 0.03724 or with a minimum value of 0.0121 and a maximum value of 0.2537. Again, it implies that data was also clustered very close to the mean. In terms of regulation requirement, it implied that, the DT SACCO segment had not met the SASRA requirement of maintaining a minimum portfolio at risk of 5 percent or below. Capital adequacy had a mean of 0.2257 or 22.57 percent and a standard deviation of 0.0812 with a minimum value of 0.0315 and a maximum value of 0.5005. This indicated that data was clustered very close to the mean. In terms of prudential regulation, the results showed that the DT SACCO segment had met the SASRA requirement of maintaining a minimum capital adequacy ratio of 10 percent. Liquidity had a mean of 0.2263 or 22.63 percent and a standard deviation of 0.0748. Liquidity had a minimum value of 0.0402 and a maximum value of 0.4589, which implied that data was clustered very close to the mean. On average, the

DT SACCO segment had met SASRA prudential requirement of a minimum liquidity ratio of 15 percent. Technical efficiency had a mean of 0.7397 or 73.97 percent with a standard deviation of 0.0764, minimum of 0.5137 and a maximum of 0.9608.

The findings concur with the findings of Kadioglu *et al.*, (2017), who showed that asset quality had a negative significant effect on the profitability of the banking sector in Turkey. However, Orando Nyangau, Maobe (2024), Anyike and Nwosi, (2015) and Barus *et al.*, (2017) found that asset quality had a positive significant effect on the profitability the quoted commercial banks in Nigeria and the financial performance of DT SACCOs in Kenya respectively. The findings support the Information Asymmetry Theory because if the management of DT SACCOs fails to ensure they have full disclosure of information from the borrowers and to effectively monitor the projects they undertake, it will result in NPLs.

Descriptive statistics also showed that capital adequacy had mean of 27.56 percent. This was higher than the minimum requirement of 10 percent set by the regulator. On the other hand, inferential analysis showed that capital adequacy had p-value of 0.000 with a beta coefficient of 0.0292433. This implied that capital adequacy had positive significant effect on the financial health. The study therefore rejected the null hypothesis that capital adequacy had no effect on the financial health of DT SACCOs in Kenya and therefore concluded that capital adequacy has a significant effect on financial performance of DT SACCOs in Kenya. The findings were in agreement with the findings of Barus *et al.*, (2017) and Mbaeri *et al.*, (2021) concluded that capital adequacy had a positive and significant relationship with the financial performance.

However, Nyanyuki *et al.*, (2022) findings contradicted with the study by showing that that capital adequacy had a negative and significant effect on the financial health of listed commercial banks in Kenya.

The findings supported the Buffer capital theory which advocates that financial institutions should ensure that there the probability of their capital adequacy level falling below the set regulatory minimum requirement is low. When the capital adequacy ratio approaches the regulatory minimum, DT SACCOs should pump in more capital in order to minimize the risk of insolvency. Since higher capital adequacy ratios translate to higher liquidity levels, DT SACCOs should maintain healthy capital adequacy ratios to enhance their ability to give out more loans as and when required (Narmeen, Saba, Kouser, & Khurram, 2018). When the capital adequacy ratio drops below the statutory minimum requirement, implicit costs as well as explicit costs may arise (Lotto, 2016). Thus, adequate capital buffer will improve the financial health of DT SACCOs in Kenya because it guarantees that SACCOs enough funds to maintain a healthy operation. Similarly, the ratio will ensure that the DT SACCOs pay their current financial commitments promptly. When capital adequacy falls below minimum requirement, DT SACCOs will run the risk of having capital shortfall, which will deter their business operations.

Descriptive statistics showed that liquidity had mean of 22.63 percent. This was higher than the minimum requirement of 15 percent set by the regulator. On the other hand, inferential analysis on capital adequacy showed that it had p-value of 0.000 and a beta coefficient of 0.002587. This implied that liquidity had a positive significant effect on

financial health. The study therefore failed to reject the null hypothesis that liquidity has no effect on financial performance and concluded that liquidity has a significant effect on financial performance of DT SACCOs in Kenya. The findings are in agreement with the findings of Muheebwa (2018) whose results established that, there was a significant relationship between liquidity and financial health. However, the findings contradicted with the findings of Adeghe *et al.*, (2019a), who found that there was a positive and insignificant effect of liquidity on bank performance.

The findings support the liquidity shiftability theory which suggests that financial institutions should maintain liquidity through holding of assets that can be quickly be disposed or "shifted" to other lenders or investors for cash, especially in times of potential deposit withdrawals. Since the DT SACCOs can have excess liquidity, they should undertake investment opportunities by investing in liquid assets. This will improve on their revenue generation thereby boosting their financial health. These liquid assets can be converted into cash without material or capital loss when need arises. When technical efficiency was tested as an independent variable, it was found to have a p-value of 0.574. Again, when technical efficiency was tested as a moderating variable being a product with asset quality, capital adequacy and liquidity, it was found to have a p-value of 0.395, 0.951 and 0.556 respectively. Since the p-values were above the significant value of 0.05, the study failed to reject the null hypothesis that technical efficiency had no significant effect on the relationship between financial stability and financial health.

Since the regulator has pegged the minimum rate of asset quality at 5%, the study therefore concluded that the DT SACCO segment is yet to achieve the required percentage. The study also concluded that asset quality had a negative significant effect on the financial performance of DT SACCOs in Kenya. This implied that the accumulation of NPLs will force the DT SACCOs to incur extra costs in the process of collecting loan arrears as well as accrued interest and other related charges. In addition, the regulator will impose compulsory provisioning for loan loss in relation to NPLs that are deducted from the SACCO revenues. These will diminish the revenue realized, subsequently deteriorating the SACCOs financial health.

The mean of capital adequacy was found to be 22.56 percent, while the regulator has set the minimum rate of capital adequacy at 10 percent. The study therefore concluded that the DT SACCO segment was performing well and was stable in terms of capital adequacy. The study also concluded that capital adequacy had a positive significant effect on the financial performance of DT SACCOs in Kenya. With the regulator setting the minimum requirement of liquidity at 10 percent, the study concluded that the DT SACCO segment was doing well in terms of capital adequacy. The mean of liquidity was found to be 22.63 percent, while the regulator has set the minimum rate of asset quality at 10 percent. The study therefore concluded that the DT SACCO segment was performing well in terms of liquidity. The study also concluded that liquidity had a positive significant effect on the financial performance of DT SACCOs in Kenya.

4.4 Inferential Analysis

In this section, the hypotheses were tested to find out whether the independent variables were significant or not (Mourougan, & Sethuraman, 2017). The results derived from the

hypothesis tests enabled the establishment of the effect of the independent variable on the dependent variable. The section also considered the moderating effect of technical efficiency on the relationship between financial stability and financial performance of DT SACCOs in Kenya. Regression analysis will also be carried out which will assist in decision making such as prediction of future occurrences and generalization. Thus, this section presented the results of various diagnostic tests and correlation that were carried out in the study.

4.4.1 Diagnostic Tests

Prior to carrying out the inferential statistics, several diagnostic tests were carried out to eliminate breach of the classical linear relationship model assumptions (CLRM). The results helped to establish how well the data fitted in the models. Violations of CLRM assumptions can lead to biased or inefficient parameter estimates. Performing regression analysis when the CLRM assumptions were violated would amount to inefficient and inconsistent parameters estimates. These diagnostic tests included test for normality, test for heteroscedasticity, correlation test, multicollinearity test, stationary test, autocorrelation test and model specification test. They were carried out before running the model (Mavruk, 2025).

4.4.1.1 Normality Test

In order to run the panel multiple regression models, it was necessary to ensure that the data as well as residuals were normally distributed. This made it possible to apply the OLS regression methodology (Lili & Kosta, 2024). After conducting the normality test using the Shapiro-Wilk test, results indicated that the residuals were normally distributed. Data is said to be normally distributed when the p-value is in excess of

0.05. In a normality test, the null hypothesis assumes that the data forming the sample originates from a population that follows a normal distribution. Results were presented in table 4.2 below.

Table 4.2: Normality Test for Data Results

Variable	Obs	W	V	z	Prob>z
ROA	795	0.99717	1.450	0.912	0.18082
AQ	795	0.99805	0.999	-0.004	0.50141
CA	795	0.99735	1.354	0.744	0.22843
LQ	795	0.99686	1.608	1.166	0.12186
TE	795	0.99770	1.179	0.404	0.34310

Source: Study Data (2023)

Table 4.2 above shows the results of the four variables and their corresponding p values. The table shows that ROA had a p value of 0.18082, asset quality had a p value of 0.50141, capital adequacy had a p value of 0.22843, liquidity had a p value of 0.12186, while technical efficiency had a p value of 0.34310. This shows that the data of variables were normally distributed since all the p-values were higher than the significance level of 0.05. The study therefore failed to reject the null hypothesis and concluded that, the distribution of the data was not significantly different from a normal distribution.

Table 4.3: Normality Test for Residuals Results

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
residual	795	0.99676	1.657	1.239	0.10775

The results in Table 4.3 show that the p-value was 0.10775 after carrying out Shapiro-Wilk test. Since the p-value was greater than the significance level of 0.05, the study failed to reject the null hypothesis and concluded that the data was not significantly different from a normal distribution. This implied that the residuals were normally distributed, thereby fulfilling the condition for normality. Data was therefore appropriate for the study.

4.4.1.2 Heteroskedasticity Test

To test the assumption that the residuals had a constant variance (homoscedastic), the study conducted heteroskedasticity test. The Breusch Pagan test was used to test for heteroskedasticity, where the null hypothesis was that the variance of error terms was constant, which implied that, the error term was homoscedastic. Table 4.3 shows the results from the test.

Table 4.4: Heteroscedasticity Test Results

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: AQ CA LQ

chi2(3)      =      3.31
Prob > chi2  =      0.3456
```

Source: Study Data (2023)

Table 4.4 shows that the calculated p-value was 0.3456, which was greater than the significance level of 0.05. This led to non-rejection of the null hypothesis (constant variance). This implied that there was absence of heteroscedasticity, thus conclusion

that the regression model was suitability for the study. This assured there was validity when carrying data analysis and statistical tests especially those used in linear regression models. With the error terms being constant, the standard errors and confidence intervals of the regression coefficients will be accurate, thereby leading to unbiased and efficient outcomes (Romeo, John & Magne, 2024).

4.4.1.3 Multicollinearity Test

The study conducted multicollinearity test to obtain tolerance and variance inflation factors (VIF) to determine the severity of multicollinearity and whether this would pose a problem in regression analysis. Shrestha (2020) considered multicollinearity to be severe when the VIF rises above 10 and the tolerance value dropped below 0.1. Thus, a VIF under 10 and a tolerance value above 0.1 is recommended. The results of the test are shown in Table 4.5 below.

Table 4.5: Multicollinearity Test Results

Variable	VIF	1/VIF
CA	2.63	0.379606
AQ	2.61	0.382575
LQ	1.03	0.973151
Mean VIF	2.09	

Source: Study Data (2023)

The results from table 4.5 shows that asset quality had a VIF of 2.63 and a tolerance of 0.379606, capital adequacy had a VIF of 2.61 and a tolerance of 0.382575, while liquidity had a VIF of 1.03 and a tolerance of 0.973151. On the other hand, overall VIF mean value was 2.09. This shows that the independent variables had a VIF of less than

10 and a tolerance value greater than 0.1, indicating the absence of severe multicollinearity (Shrestha, 2020). Thus, the level of multicollinearity in the model could be tolerated with non- existence of a multicollinearity problem among the variable.

4.4.1.4 Autocorrelation Test

In order to carry out regression analysis, autocorrelation assumption that requires residuals not be correlated across time had to be ascertained. Thus, to find out whether the residuals were correlated with respect to time, the study performed autocorrelation test by adopting Wooldridge test for autocorrelation in panel data which is an LM test. The null hypothesis was that there was no first order serial /auto correlation while the alternative hypothesis was that first order serial /auto correlation did exist.

Table 4.6: Autocorrelation Test Results

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
      F( 1,      158) =      0.012
      Prob > F =      0.9116
```

Source: Study Data (2023)

Table 4.6 shows that the F statistics had a value of 0.012 while the p-value was found to be 0.9116. Since the p-value exceeded the 5 percent significance level, the results called for failure to reject the null hypothesis, with the conclusion that, no first order serial/auto correlation existed; hence residuals were not serially correlated. Residuals are correlated when the p-value is less than 5 percent significance level and vice versa.

Thus, the study failed to reject the null hypothesis and instead concluded that there was no problem of serial correlation (Khosropour, 2017).

4.4.1.5 Stationarity Test

In order to avoid spurious regressions, the study conducted stationarity test on the variables that were used in the study. The study adopted Fisher-type unit root test where the null hypothesis was that all panels contain unit roots while the alternative hypothesis was that at least one panel is stationary. Each variable was tested for stationarity and the results are as shown below.

Table 4.7: Stationarity Tests Results for ROA

```

Fisher-type unit-root test for ROA
Based on augmented Dickey-Fuller tests
-----
Ho: All panels contain unit roots          Number of panels =    159
Ha: At least one panel is stationary       Number of periods =     5

AR parameter: Panel-specific              Asymptotics: T -> Infinity
Panel means:   Included
Time trend:    Not included
Drift term:    Not included                ADF regressions: 0 lags
-----

```

		Statistic	p-value
Inverse chi-squared(318)	P	1240.9672	0.0000
Inverse normal	Z	-11.9630	0.0000
Inverse logit t(794)	L*	-21.6891	0.0000
Modified inv. chi-squared	Pm	36.5980	0.0000

```

-----
P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.
-----

```

Source: Study Data (2023)

Tables 4.7 shows that the calculated p-value from Fisher type unit root test for ROA, data was less than 0.05 significance level. This implied that the study rejected the null hypothesis that the data contained a unit root. By rejecting the null hypothesis, it indicated that the alternative hypothesis was accepted, hence the data did not contain a unit root, meaning that the data relating to ROA was stationary.

Table 4.8: Stationarity Tests Results for Asset Quality

```

Fisher-type unit-root test for AQ
Based on augmented Dickey-Fuller tests

```

Ho: All panels contain unit roots	Number of panels =	159
Ha: At least one panel is stationary	Number of periods =	5
AR parameter: Panel-specific	Asymptotics: T ->	Infinity
Panel means: Included		
Time trend: Not included		
Drift term: Not included	ADF regressions: 0 lags	

		Statistic	p-value
Inverse chi-squared(318)	P	1114.5373	0.0000
Inverse normal	Z	-11.2036	0.0000
Inverse logit t(794)	L*	-19.0997	0.0000
Modified inv. chi-squared	Pm	31.5848	0.0000

```

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

```

Source: Study Data (2023)

Tables 4.8 shows that the calculated p-value from Fisher type unit root test for asset quality was less than 0.05 significance level. This implied that the study rejected the null hypothesis that the data contained a unit root. By rejecting the null hypothesis, it indicated that the alternative hypothesis was accepted, hence the data did not contain a unit root, meaning that the data relating to asset quality was stationary.

Table 4.9: Stationarity Tests Results for Capital Adequacy

Fisher-type unit-root test for CA
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots	Number of panels =	159
Ha: At least one panel is stationary	Number of periods =	5

AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Not included	
Drift term: Not included	ADF regressions: 0 lags

		Statistic	p-value
Inverse chi-squared(318)	P	1058.3530	0.0000
Inverse normal	Z	-11.8942	0.0000
Inverse logit t(799)	L*	-18.4715	0.0000
Modified inv. chi-squared	Pm	29.3569	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

Source: Study Data (2023)

Tables 4.9 shows that the calculated p-value from Fisher type unit root test for capital adequacy data was less than 0.05 significance level. This implied that the study rejected the null hypothesis that the data contained a unit root. By rejecting the null hypothesis, it indicated that the alternative hypothesis was accepted, hence the data did not contain a unit root, meaning that the data relating to capital adequacy was stationary.

Table 4.10: Stationarity Tests Results for Liquidity

Fisher-type unit-root test for LQ
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots	Number of panels =	159
Ha: At least one panel is stationary	Number of periods =	5
AR parameter: Panel-specific	Asymptotics: T -> Infinity	
Panel means: Included		
Time trend: Not included		
Drift term: Not included	ADF regressions: 0 lags	

		Statistic	p-value
Inverse chi-squared(318)	P	1398.8933	0.0000
Inverse normal	Z	-14.6787	0.0000
Inverse logit t (799)	L*	-25.9734	0.0000
Modified inv. chi-squared	Pm	42.8602	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

Source: Study Data (2023)

Tables 4.10 shows that the calculated p-value from Fisher type unit root test for liquidity data was less than 0.05 significance level. This implied that the study rejected the null hypothesis that the data contained a unit root. By rejecting the null hypothesis, it indicated that the alternative hypothesis was accepted, hence the data did not contain a unit root, meaning that the data relating to liquidity was stationary.

Table 4.11: Stationarity Tests Results for Technical Efficiency

```

Fisher-type unit-root test for TE
Based on augmented Dickey-Fuller tests

```

Ho: All panels contain unit roots	Number of panels =	159
Ha: At least one panel is stationary	Number of periods =	5

AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Not included	
Drift term: Not included	ADF regressions: 0 lags

		Statistic	p-value
Inverse chi-squared(318)	P	1040.0037	0.0000
Inverse normal	Z	-11.1447	0.0000
Inverse logit t(789)	L*	-18.0625	0.0000
Modified inv. chi-squared	Pm	28.6293	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

Source: Study Data (2023)

Tables 4.10 shows that the calculated p-value from Fisher type unit root test for technical efficiency data was less than 0.05 significance level. This implied that the study rejected the null hypothesis that the data contained a unit root. By rejecting the null hypothesis, it indicated that the alternative hypothesis was accepted, hence the data did not contain a unit root, meaning that the data relating to technical efficiency was stationary.

4.4.1.6 Model Specification Test

In order to decide on which model to adopt between fixed effects and random effects model, Hausman test was run. Table 4.12 shows the results of the test.

Table 4.12: Model Specification Test Result

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
AQ	-.0788714	-.0859544	.0070829	.0015452
CA	.0271932	.0290884	-.0018952	.000738
LQ	.0004104	.0024137	-.0020033	.0011005

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

$$\text{chi2}(3) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$$

$$= 33.08$$

$$\text{Prob}>\text{chi2} = 0.0000$$

Source: Study Data (2023)

The result produced a p-value of 0.0000 which was less than 5% level of significance level. The null hypothesis stated that the random effect model was appropriate while the alternative hypothesis stated that the fixed effect model was appropriate. Result from Hausman test produced a chi-square of 33.08 and a p value of 0.0000, which was lower than 0.05, implying that at 5 percent significant level, the chi-square value was statistically significant. The study therefore failed to reject the null hypothesis, concluding that FEM will be the best model to use in the study. Thus, the study therefore adopted the fixed effects model as recommended by Green (2008). This implies that there was no systematic difference between the estimates of the Random effects model and fixed effects model.

4.5 Correlation Analysis Test

To test the direction of the association amongst the study variables, the study used a correlation matrix as recommended by (Dancy & Reidy, 2004).

Table 4.13: Correlation Analysis Test

	ROA	AQ	CA	LQ
ROA	1.0000			
AQ	-0.8921*	1.0000		
	0.0000			
CA	0.8610*	-0.7857*	1.0000	
	0.0000	0.0000		
LQ	0.1782*	-0.1378*	0.1631*	1.0000
	0.0000	0.0001	0.0000	

***Correlation is significant at the 0.05 level**

Source: Study Data, 2023

Results from table 4.13 showed that the correlation coefficient existing between the financial health (ROA) and asset quality (AQ) was -0.8921 (or -89.21%) and a corresponding p-value of 0.0000. This shows that asset quality has a strong negative correlation that also has statistically significant effect with financial health. Increase in asset quality will therefore have a strong negative effect on financial health. The correlation coefficient between capital adequacy and financial health was 0.8610 (or 86.10 percent) with a corresponding p-value of 0.000. This meant that capital adequacy had a strong and significant positive correlation on financial health. Increase in capital adequacy will therefore have a strong positive effect on financial health. Finally, the correlation coefficient between liquidity and financial health was 0.1782, with a corresponding p-value of 0.0000. This implies that liquidity has a weak positive correlation with financial health and that increase in liquidity will have a positive effect on financial health.

4.6 Regression Model

A panel regression model was used to check whether the predictor variables were significant. This was derived by running a regression where a coefficients table showing the estimates of the beta coefficients, the associated t-statistic and p-values. For a given predictor, the t-statistic evaluated whether or not there was a significant association between the predictor and the outcome variable i.e., whether the beta coefficient of the predictor was significantly different from zero. The model was fitted to establish the relationships between ROA and Capital Adequacy, Asset Quality, and Liquidity as follows:

$$\text{ROA} = \beta_0 + \beta_1\text{AQ} + \beta_2\text{CA} + \beta_3\text{LQ} + \varepsilon_{it} \dots \dots \dots 4.1$$

Where;

$\beta_0, \beta_1, \beta_2, \beta_3$, = beta coefficients,

ROA=Financial performance,

AQ=Asset quality,

CA=Capital adequacy,

LQ=Liquidity,

ε_{it} = error term.

Table 4.14: Panel Regression Results

Source	SS	df	MS			
Model	.022638966	3	.007546322	Number of obs =	795	
Residual	.003567302	791	4.5099e-06	F(3, 791) =	1673.29	
Total	.026206267	794	.000033005	Prob > F =	0.0000	
				R-squared =	0.8639	
				Adj R-squared =	0.8634	
				Root MSE =	.00212	

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
AQ	-.086802	.0032714	-26.53	0.000	-.0932236	-.0803803
CA	.0292433	.0015062	19.42	0.000	.0262867	.0321999
LQ	.0025487	.0010208	2.50	0.013	.0005449	.0045526
_cons	.026008	.0007144	36.40	0.000	.0246056	.0274104

Source: Study Data, 2023

From table 4.14 above, model 4.1 was re-written as:

$$\text{ROA} = 0.026008 - 0.086802\text{AQ} + 0.0292433\text{CA} + 0.0025487\text{LQ} \dots\dots\dots 4.2$$

Where:

ROA=Financial performance;

AQ=Asset quality;

CA=Capital adequacy;

LQ=Liquidity.

The study was 95 percent confident that the true value of the coefficient for asset quality lies between -0.0932236 and -0.0803803. The study was also 95 percent confident that the true value of the coefficient for capital adequacy lies between 0.0262867 and 0.0321999. On the other hand, the study was 95 percent confident that the true value of the coefficient for asset quality lies between 0.0246056 and 0.02744104.

4.7 Goodness of Fit Model

The overall accuracy or quality of the model was assessed by R^2 (or the coefficient of determination) in table 4.14 above. R^2 being a statistical measure established the proportion of variance in the response variable that could be explained by the explanatory variable. R-squared showed how well the data fitted the regression model (the goodness of fit) or how well the regression model explained the observed data. The overall quality of the model was assessed by examining the R-squared (R^2) and Residual Standard Error (RSE). With R^2 representing the correlation coefficient between the observed values of the outcome variable (y) and the fitted (i.e., predicted) values of y, R^2 represented the proportion of variance, in the outcome variable y, that may be predicted by knowing the value of the x variables. The R^2 value of 0.8639 reveals that 86.36 percent of the variation in financial health (ROA) can be explained by asset quality, capital adequacy, and liquidity, while 13.61 percent of the variance in ROA cannot be predicted by the three independent variables. The p-value of 0.0000 suggests that overall model is statistically significant. With a high R-squared, the results indicate more variability is explained by the model.

4.8 Hypotheses Testing

This section involved the testing, interpretation and discussion of the results derived from the hypotheses testing. There were four hypotheses that were based on the specific objectives of the study as presented in chapter two. To determine the statistical significance in regard to the study hypotheses, it was necessary to conduct panel regression. Hypothesis H_{01} , H_{02} and H_{03} were based on prudential regulation dimensions and were analyzed using panel regression. The tests were conducted with statistical

significance at ninety five percent and confidence level of 5 percent. The following null hypotheses were tested: H₀₁: Asset Quality has no significant effect on financial health of DT SACCOs in Kenya. H₀₂: Capital Adequacy has no significant effect on financial health of DT SACCOs in Kenya, H₀₃: Liquidity has no significant effect on financial health of DT SACCOs in Kenya. From the results of regression, a model was formulated.

4.8.1 Test of Hypothesis One

Test of hypothesis one analysed whether asset quality had significant effect on the financial health of DT SACCOs in Kenya. Results from table 4.14 above shows that the p-value was 0.000, which was below the significant level of 0.05. The study therefore rejected the null hypothesis that stated that asset quality had no significant effect on the financial health of DT SACCOs in Kenya and accepted the alternative hypothesis. The result therefore implied that asset quality indeed had significant effect on the financial health of DT SACCOs in Kenya. The beta coefficient (β_1) for asset quality was – 0.086802 (negative) which implied that asset quality affects financial health in a negatively. Thus, on average, a unit increase in asset quality would result in approximately 8.6802 percent decrease in financial health, holding all other predictors fixed.

The study findings were in agreement with other studies on how the independent variables affect the dependent variable. Kadioglu et al., (2017) revealed that asset quality has a negative significant effect on profitability of the banking sector. Additionally, Adeghe *et al.*, (2019) found a negative and significant effect of asset quality on bank performance. On the contrary, Kadioglu *et al.*, (2017) observed

negative a significant relationship between NPLs and bank profitability. Oduor (2020) found that asset quality in commercial banks has a strong and positive effect on their financial performance, while Mutunga and Gatauwa (2021) found that financial performance of SACCOs is affected by their asset quality in a positive way. The study supports the concept of asymmetric information theory which centers around unequal knowledge between each party to a transaction which can lead to adverse selection, moral hazard, and monopoly of knowledge. This makes borrowers default their loans subsequently affecting the asset quality of DT SACCOs.

Abata (2014) found that deterioration in asset quality in financial institutions adversely affects their financial performance, while Gitonga (2014) asserts that NPLs increase has a negative effect on the asset quality and profitability because it increases the loan loss provisions and the related loans recovery costs involved. Mutunga and Gatauwa (2021) found that the financial performance of SACCOs is affected by the asset quality in a positively, and thus recommend DT SACCOs to minimize their NPLs to total loans ratio. On the contrary, Kadioglu, Telceken, & Ocal, (2017) observed that the relationship between bank profitability and NPLs was negatively significant. Thus, the increase or decrease in NPLs has diverse effect on financial performance due to provisions for loan loss and loan recovery costs.

4.8.2 Test of Hypothesis Two

The second hypothesis was to establish the effect of capital adequacy on the financial health of DT SACCOs in Kenya. From table 4.13, the calculated p-value in relation to capital adequacy was found to be 0.0000, which was below the 0.05 significance level. This indicated that capital adequacy had a significant effect on financial health. The

findings led to rejection of the null hypothesis that capital adequacy had no significant effect on financial health of DT SACCOs in Kenya. The findings therefore led to the conclusion that capital adequacy actually had a significant effect on the financial health of DT SACCOs in Kenya. The beta coefficient (β_2) related to capital adequacy was 0.0292433 (positive). This indicated that capital adequacy affects financial health in a positive direction. This implied that on average, a unit increase in capital adequacy will result in approximately 2.92433 percent increase in financial health, holding all other predictors fixed.

The study findings were consistent with several other studies. Barus et al., (2017) concluded that capital adequacy had a positive and significant effect on the financial performance of SACCOs. Similarly, Mbaeri et al., (2021) concluded that capital adequacy ratio had a positive and significant relationship with the financial performance of commercial banks. However, the study findings contradicted the findings of other studies. Nyanyuki et al., (2022) showed that the capital adequacy had a negative and significant effect on financial performance. Nguyen et al., (2018) findings also contradicted with the findings of the study as he found that capital adequacy was insignificantly related to ROA. Again, Musyoka (2017) noted a negative significant link between capital adequacy and ROA which were contrary to the current study findings. The study findings supported the Buffer capital theory which explains that adequately capitalized financial institutions are strong to undertake risky ventures which subsequently bring forth more profits.

Studies have found capital adequacy to have varying effects on the financial performance of financial institutions. Kamran, Omran & Arshad, (2019); Daoud and Kammoun (2020) found that capital adequacy has a positive and statistically significant effect on financial stability in banks. Oduor (2020) found that the effect of capital adequacy on the financial performance of listed commercial banks in Kenya to be positive but weak. On the other hand, Adegheet al., (2019) found that the effect of capital adequacy on the financial performance of banks is positive but insignificant. Mutunga and Gatauwa (2021) found a positive effect of capital adequacy on the financial performance of SACCOs in Nairobi City County, though the level of significance was not stated. However, Nyanyuki (2022) findings were contrary to other findings and stating that there existed a negative association between capital adequacy and financial performance of commercial banks in Kenya.

4.8.3 Test of Hypothesis Three

The third hypothesis was to establish whether liquidity had significant effect on the financial health of DT SACCOs in Kenya. The null hypothesis was that liquidity had no significant effect on the financial health of DT SACCOs in Kenya. Results from Table 4.13 indicate that the calculated p-value relating to liquidity was 0.000, which was lower than the significance level of 0.05. The study therefore rejected the null hypothesis that liquidity had no significant effect on financial health of DT SACCOs in Kenya and therefore concluded that, liquidity actually had a significant effect on the financial health of DT SACCOs in Kenya. The beta coefficient (β_3) related to liquidity was 0.0025487 (positive). This indicated that liquidity affects financial health in a positive direction. This led to the conclusion that on average, a unit increase in liquidity

will result in approximately 0.25487 percent increase in financial health, holding all other predictors fixed.

The study findings were consistent with several other previous studies. Muheebwa (2018) found that the relationship between liquidity and financial performance of the SACCOs significant. Again, Onyekwelu *et al.*, (2018) found that liquidity had a positive and significant effect on banks' profitability ratios. According to Adeghe *et al.*, (2019), there is a positive and insignificant effect of liquidity on bank performance, a finding that is supported by Oduor (2020) who also found a positive but weak effect of liquidity on the financial performance of commercial banks listed in Kenya. However, the study findings were contradicting with those of Shah, Khan, and Tahir (2018) who found that liquidity insignificantly affected profitability of the commercial banks in Pakistan. Besides, the study also contradicted with the findings of Gweyi *et al.*, (2018) who revealed that liquidity negatively affects the SACCOs financial performance and those of Muriithi and Waweru (2017), who found a negative and substantial link between financial performance and liquidity in commercial banks.

4.8.4 Test of Hypothesis Four

The fourth null hypothesis was to investigate whether there was a significant moderating effect of technical efficiency on the relationship between prudential regulation and financial health of DT SACCOs in Kenya. The results helped in discovering the existence of any change in magnitude and/or any directional change of the relationship between the two variables. To carry out the moderation effect, a two-step procedure that was specified by Whisman and McClelland (2005) moderation test was adopted. To do this, the study conducted a test as to whether technical efficiency

was an explanatory variable as shown in model 3.3 estimation or a moderating variable. The results from the test were presented in table 4.15 and analysis conducted on the results from the test as to whether technical efficiency was an independent variable.

Table 4.15: Technical Efficiency as an Independent Variable

Source	SS	df	MS			
Model	.022640393	4	.005660098	Number of obs =	795	
Residual	.003565874	790	4.5138e-06	F(4, 790) =	1253.96	
Total	.026206267	794	.000033005	Prob > F =	0.0000	
				R-squared =	0.8639	
				Adj R-squared =	0.8632	
				Root MSE =	.00212	

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
AQ	-.0868454	.0032737	-26.53	0.000	-.0932716	-.0804191
CA	.0292349	.0015069	19.40	0.000	.0262768	.0321929
LQ	.0026062	.0010264	2.54	0.011	.0005915	.0046209
TE	-.0005582	.0009925	-0.56	0.574	-.0025064	.00139
_cons	.0264149	.001017	25.97	0.000	.0244186	.0284112

Source: Study Data, 2023

Table 4.16: Technical Efficiency as a Moderating Variable

Source	SS	df	MS			
Model	.022662065	7	.003237438	Number of obs =	795	
Residual	.003544203	787	4.5034e-06	F(7, 787) =	718.88	
				Prob > F	= 0.0000	
				R-squared	= 0.8648	
				Adj R-squared	= 0.8636	
				Root MSE	= .00212	
Total	.026206267	794	.000033005			

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
AQ	-.0573519	.0343113	-1.67	0.095	-.1247044	.0100006
CA	.0302337	.0150092	2.01	0.044	.0007709	.0596965
LQ	-.0027318	.0100975	-0.27	0.787	-.0225531	.0170896
TE	.0024607	.0097163	0.25	0.800	-.0166123	.0215337
AQTE	-.039361	.0462488	-0.85	0.395	-.1301465	.0514246
CATE	-.0012623	.0204164	-0.06	0.951	-.0413393	.0388147
LQTE	.0078981	.0134194	0.59	0.556	-.0184441	.0342402
_cons	.0239998	.0071975	3.33	0.001	.0098713	.0381284

Source: Study Data, 2023

Table 4.17: Summary of Technical Efficiency as an Independent Variable

Variable	Coefficients	Std. Error	t value	P-value
AQ	-0.0868454	0.0032737	26.53	0.000
CA	0.0292349	0.0015069	19.40	0.000
LQ	0.0026062	0.0010264	2.54	0.574
TE	-0.0005582	0.0009925	0.56	0.976

From the table 4.17 above, technical efficiency had a p-value of 0.976, which indicated that technical efficiency had no significant effect on financial health. Thus, technical efficiency was not an independent variable. Based on the analysis of the data in above on Table 4.16, the model below was formulated:

$$ROA = 0.0239998 + -0.0868454AQ + 0.029349CA \dots\dots\dots 4.4$$

Table 4.18: Summary of Technical Efficiency as a Moderating Variable

Variable	Coefficients	Std. Error	t value	P-value
AQ	-0.0573519	0.0343113	-0.167	0.095
CA	0.0302337	0.0150092	2.01	0.044
LQ	-0.0027318	0.0100975	-0.27	0.787
TE	0.0024607	0.0097163	0.25	0.800
AQTE	0.039361	0.0462488	-0.85	0.395
CATE	-0.0012623	0.0204164	-0.06	0.951
LQTE	-0.0078981	0.0134194	0.59	0.556
Cons	0.0239998	0.0071975	3.33	0.001

Where;

AQTE=Interaction of Asset Quality and Technical Efficiency,

CATE=Interaction of Capital Adequacy and Technical Efficiency,

LQTE=Interaction of Liquidity and Technical Efficiency,

ε_{it} =Error term.

From Table 4.18, the p-value of asset quality was 0.095 which was higher than the significance level of 0.05. This implied that asset quality has no statistically significant effect on financial health. The p-value of capital adequacy was at 0.044 which was more than the significance level of 0.05, indicating that capital adequacy has no statistically significant on financial performance. The p-value of liquidity was 0.787 which was more than the significance level of 0.05, indicating that liquidity has no statistically significant effect on financial health. The p-value of technical efficiency was 0.800, which was higher than the significance level of 0.05, meaning that technical efficiency

does not have moderating effect on the relationship between financial stability and financial health.

When asset quality is interacted with technical efficiency, the p-value was 0.395, which was higher than the significance level of 0.05, indicating that, asset quality had no significant effect on financial health. When capital adequacy was interacted with technical efficiency, the p-value was 0.951 which was more than the significance level of 0.05, indicating that capital adequacy does not have significant effect on financial health. When liquidity was interacted with technical efficiency, the p-value was 0.556 which was more than the significance level of 0.05, indicating that liquidity has no significant effect on financial health.

Table 4.19: Summary of the Moderating Effect of Technical Efficiency

Analysis	Parameter	Result	Decision
Step one: Equation 3.3 Technical efficiency as an explanatory variable	Coefficient of technical efficiency ($p > 0.05$)	insignificant of technical efficiency (No significant effect)	Technical efficiency cannot moderate the relationship between financial stability and financial health of DT SACCOs in Kenya
Step two: Equation 3.4 Technical efficiency as a moderating variable	Coefficient of technical efficiency ($p > 0.05$)	insignificant coefficient of technical efficiency	Technical efficiency does not moderate the relationship between financial stability and financial health of DT SACCOs in Kenya

From table 4.19 above, technical efficiency cannot be an explanatory variable and neither can it be a moderating variable. Thus, technical efficiency was found to have no significant moderating effect on the relationship between financial stability and financial health of DT SACCOs in Kenya.

Table 4.20: Summary of Hypothesis Testing

Null hypothesis Result	Findings	Result
H ₀₁ : Asset quality does not have a significant effect on the financial health.	p=0.000 $\beta = -0.086802$	Reject H ₀₁
H ₀₂ : Capital adequacy does not have a significant effect on the financial health.	p=0.000 $\beta = 0.0292433$	Reject H ₀₂
H ₀₃ : Liquidity does not have a significant effect on the financial health.	p=0.000 $\beta = 0.0025487$	Reject H ₀₃
H ₀₄ : Technical efficiency does not moderate the relationship between financial stability and the financial health.	No moderation effect	Fail to Reject H ₀₄

Table 4.20 summarizes the results from hypotheses testing where hypotheses one, two and three were rejected, while the study failed to reject the fourth hypothesis. When capital adequacy, asset quality and liquidity were tested under the moderation effect, capital adequacy was found to have significance effect on financial performance with a p-value of 0.044 while capital adequacy and liquidity were found to have no significant effect since their p-values were greater than 0.05 ($p > 0.05$). Asset quality with technical efficiency (AQTE) had a $p=0.395$, capital adequacy with technical efficiency (CATE) had a $p = 0.951$, while liquidity with technical efficiency (LQTE) had a $p=0.556$. Thus, the researcher proceeded to remove them from the final model. This implied that technical efficiency cannot moderate the relationship between financial stability and financial health.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presented the summary of the study, conclusion and recommendations. First, the study presented the summary of findings of the study in relation to the study objectives. The findings were then related to previous studies carried out in the past. Major conclusions drawn from the research findings were presented on the basis of research hypothesis. The study later presented recommendations that were derived from the conclusions for practice or improvement and for further studies. Finally, the study provided suggestions for future research work based on the findings and conclusions generated from the study.

5.2 Summary of the Study

To achieve the objectives of the study, relevant theories were adopted to underpin the study, while relevant studies were reviewed. A conceptual framework that depicted the relationships amongst the study variables was then presented. Theories included finance theory, disruptive innovation theory, shareholder theory; buffer theory of capital adequacy, information asymmetry theory; liquidity shiftability theory and efficiency structure theory. The study adopted explanatory research design because the researcher aimed at exploring new findings from the existing phenomena. An overview of the research methodology used and the justification of the choice of positivist philosophy were presented. Data collection process as well and the method used to determine the number of SACCOs to be used in the analysis were also documented. The

operationalization and measurement of variables were presented together with the process of deriving an empirical model being discussed. Finally, data analysis process was carried out in order to make relevant decisions in relation to the four hypotheses that were tested on the basis of both descriptive and inferential statistics.

The first objective of the study was to investigate the effect of asset quality on the financial health of DT SACCOs in Kenya. The study revealed that asset quality had a negative and significant effect on the financial health of DT SACCOs in Kenya. The study demonstrates that asset quality is a significant variable and DT SACCOs should put more on it. The study expectation was that there is a negative significant effect of asset quality on the financial health and this expectation was met through statistical analysis. The second objective of the study was to investigate the effect of capital adequacy on the financial health of DT SACCOs in Kenya. Statistical analysis indicated that capital adequacy had a positive and significant effect on the financial health, confirming the expectation of the objective. It was evident that capital adequacy has the higher positive effect on the financial health than liquidity.

The third objective of the study was to investigate the effect of liquidity on the financial health of DT SACCOs in Kenya. The study revealed that liquidity had a positive and significant effect on the financial health. The study confirmed the expectation of the study through statistical analysis. It was noted that liquidity had a lesser positive contribution to financial health relative to capital adequacy. The fourth objective of the study was to investigate the moderating effect of technical efficiency on the relationship between prudential regulation and financial health of DT SACCOs in Kenya. Statistical analysis revealed that technical efficiency had no moderating effect on the relationship

between prudential regulation and financial health. The findings of the study contradicted the expectation of the study.

5.3 Conclusion of the Study

The first objective of the study was to investigate the effect of asset quality on the financial health of DT SACCOs in Kenya. The researcher inferred some important conclusions on the basis of the findings. Regarding the first objective, asset quality was found to be statistically significant and negative. This implies that asset quality has a significant negative effect on the financial health of DT SACCOs in Kenya. Based on the second objective, capital adequacy was found to be positive and statistically significant, implying that capital adequacy has a positive and significant effect on the financial health of DT SACCOs in Kenya. On the third objective, liquidity was found to be positive and statistically significant and hence it was concluded that liquidity has a positive and significant effect on the financial health of DT SACCOs in Kenya. Furthermore, the study sought to establish the moderating effect of technical efficiency on the relationship between prudential regulation and financial health of DT SACCOs in Kenya. Based on this objective, the researcher concluded that technical efficiency does not have a moderating effect on the relationship between prudential regulation and financial health of DT SACCOs in Kenya.

5.4 Contribution to Knowledge

Although prior empirical studies established that prudential regulation has a significant relationship with financial health, it was noted that the objective of these past studies were on SACCOs in counties or other countries. Moreover, these studies had a couple of critical limitations relating to methodology, context, consistency of results, and

conceptualization of research variables and models. When considering the context of DT SACCOs in the whole country, empirical studies conducted revealed that prudential regulation had effect on financial health. This study therefore contributes to empirical literature by revealing that prudential regulation has effect on the financial health of DT SACCOs in Kenya.

The study contributes to theoretical literature by providing the basis upon which the theoretical propositions utilized in the formulation of the research hypotheses can be empirically tested. The study supports the proposition of asymmetry information that that the information withheld by borrowers in the loan application process is responsible for creating non-performing loans which contribute to financial health. Furthermore, the study supports the theoretical proposition of buffer theory of capital adequacy that a SACCO should maintain minimum capital above that set by the regulator. Moreover, the study supports the proposition of liquidity shiftability theory to the effect that there is a reserve of convertible assets into cash in time of need to enhance financial health.

5.5 Recommendations for Policy and Practice

The findings of the study have important implications for policy and practice that can be drawn for the purpose of enhancing financial health of DT SACCOs in Kenya. Asset quality was found to have a negative effect on financial health. The government should legislate on the timeline of remittance of deductions by employers. Besides, the regulator should allocate more supervision time to the DT SACCOs that draw its members from sectors that experience more financial challenges. The SACCOs management need to strategically restructure their credit policies as per their area of operation to contain the surge of NPLs. These include establishing sound lending

standards and credit risk management processes to reducing the risk of loans default. Regular reviews and updates of credit policies and risk management practices is essential in a changing market condition to ensure low NPLs. A working credit monitoring information system that evaluates and monitors NPLs regularly is also recommended to process accurate loan repayments, automate payment reminders, and track payment history. Creditworthiness of borrowers should be monitored using a good credit rating systems and provide alerts when credit scores deteriorate. Besides, SACCO should organize education forums to sensitize their members on the prudent management of loans.

Capital adequacy was found to have positive effect on the financial health of DT SACCOs in Kenya. As such, the regulator needs to consider the amalgamation and merger of small tiered DT SACCOs to form larger SACCOs with higher capital base and more stable in order to enhance their competition with the tier one and tier two DT SACCOs. Management of DT SACCOs should constantly evaluate their capital requirements and adjust their capital levels according to their plans to ensure the current capital levels comply with the set regulatory requirements. This will ensure that the SACCOs have a buffer in case of a financial turbulence affecting the SACCO. Management should sensitize their members to increase their share capital contributions by promoting capital injections, optimizing dividend payout policies and implement stricter better capital management practices. The management can also adopt a counter-cyclical policy such as contingent capital requirements for DT SACCOs that increase during boom periods and reduced during busts. Fostering active member participation is crucial for long-term SACCO sustainability.

Liquidity was found to have a weak positive correlation with financial health and a positive significant effect on financial health of DT SACCOs in Kenya. As such, the regulator should discourage DT SACCOs from holding members funds in idle state but rather invest it in short-term investments in liquid asset in money markets, treasury bills or in other form. However the regulator should ensure that SACCOs do not invest in high-risk financial markets and other institutions besides ensuring that such investments are diversified. Moreover, DT SACCOs should monitor their cash flows and maintain a liquidity buffer. In time of illiquidity, the regulator should encourage inter-borrowing of fund amongst the DT SACCOs. Management of the DT SACCOs can utilise the findings to intensify and optimize the utilization of resources at their disposal. DT SACCOs should also re-look in their interest expense payment on deposits as this might end up hurting the liquidity of these SACCOs. Reasonable interest expense on deposits rate should therefore be determined to reduce the cash paid out.

5.6 Suggestions for Further Studies

The current study investigated the effect of prudential regulation on the financial health of DT SACCOs in Kenya. Future researchers should concentrate on validating the findings and conclusion of this study by considering redoing researches in other sectors in Kenya. In addition, the limitation of duration and secondary data can be addressed by future researchers through application of objective indicators of financial health. Moreover, further studies should be carried out to investigate the moderating and mediating role of other variables on the relationship between prudential regulation and financial health.

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APPENDICES

Appendix I: Letter of Introduction

Peter Njuguna Wanjiru

Kenyatta University

P.O. Box 43844 – 00200

Nairobi

To

The CEO,

SASRA.

RE: LETTER OF INTRODUCTION

My name is Peter Njuguna Wanjiru. I am a postgraduate student at Kenyatta University, School of Business, Economics and Tourism. I intend to conduct a study on the **“Financial stability and financial performance of Deposit Taking Savings and Credit Co-operatives in Kenya”**. I kindly request for data on the financial stability and financial performance of Deposit Taking SACCOs in Kenya for the period 2017 to 2021. The requested information is purely for academic purpose.

Thank you for your cooperation.

Yours faithfully,

Peter Njuguna Wanjiru

Appendix II: Deposit Taking SACCOs in Kenya - 2021

1	Mwalimu national SACCO Ltd
2	Stima SACCO Ltd
3	Kenya police SACCO Ltd
4	Harambee SACCO Ltd
5	Afya SACCO Ltd
6	Metropolitan SACCO Ltd
7	Unaitas SACCO Ltd
8	Imarisha SACCO Ltd
9	United Nations SACCO Ltd
10	Tower SACCO Ltd
11	Ukulima SACCO Ltd
12	Invest & Grow (IG) SACCO Ltd
13	Gusii Mwalimu SACCO Ltd
14	Bandari SACCO Ltd
15	Hazina SACCO Ltd
16	Imarika SACCO Ltd
17	Mentor SACCO Ltd
18	Kenya bankers SACCO Ltd
19	Newfortis SACCO Ltd
20	Boresha SACCO Ltd
21	Kimisitu SACCO Ltd
22	Safaricom SACCO Ltd

23	Winas SACCO Ltd
24	Cosmopolitan SACCO Ltd
25	Sheria SACCO Ltd
26	Trans nation SACCO Ltd
27	Mombasa Ports SACCO Ltd
28	Kitui Teachers SACCO Ltd
29	Magereza SACCO Ltd
30	Bingwa SACCO Ltd
31	Ollin SACCO Ltd
32	Solution SACCO Ltd
33	Waumini SACCO Ltd
34	Nacico SACCO Ltd
35	Ushuru SACCO Ltd
36	Jamii SACCO Ltd
37	K-Unity SACCO Ltd
38	Amica SACCO Ltd
39	Kwetu SACCO Ltd
40	Unison SACCO Ltd
41	Maisha Bora SACCO Ltd
42	Yetu SACCO Ltd
43	Fortune SACCO Ltd
44	Chai SACCO Ltd
45	Capital SACCO Ltd

46	Nyati SACCO Ltd
47	Taifa SACCO Ltd
48	Tembo SACCO Ltd
49	Shirika DTS SACCO Ltd
50	Kenpipe SACCO Ltd
51	Ndege chai SACCO Ltd
52	Kenya Highlands SACCO Ltd
53	Tai SACCO Ltd
54	Kenversity SACCO Ltd
55	Ng'arisha SACCO Ltd
56	GCD SACCO Ltd
57	Asili SACCO Ltd
58	The Noble SACCO Ltd
59	Qwetu SACCO Ltd
60	Nawiri SACCO Ltd
61	NSSF SACCO Ltd
62	Egerton University SACCO Ltd
63	Nation SACCO Ltd
64	Mwito SACCO Ltd
65	Biashara SACCO Ltd
66	Ardhi SACCO Ltd
67	Trans National Times SACCO Ltd
68	Skyline SACCO Ltd

69	Dimkes SACCO Ltd
70	Chuna SACCO Ltd
71	Azima SACCO Ltd
72	Ukristo Na Ufanisi SACCO Ltd
73	Kingdom SACCO Ltd
74	Wakenya Pamoja SACCO Ltd
75	Trans-Elite County SACCO Ltd
76	Simba Chai SACCO Ltd
77	Wanandegge SACCO Ltd
78	Wananchi SACCO Ltd
79	Taqwa SACCO Ltd
80	Faridi SACCO Ltd
81	Wana-Anga SACCO Ltd
82	Universal Traders SACCO Ltd
83	Daima SACCO Ltd
84	Southern Star SACCO Ltd
85	Smartlife SACCO Ltd
86	Elimu SACCO Ltd
87	Eco-Pillar SACCO Ltd
88	Centenary SACCO Ltd
89	Kite SACCO Ltd
90	Fundilima SACCO Ltd
91	Telepost SACCO Ltd

92	Mafanikio SACCO Ltd
93	Muki SACCO Ltd
94	Tabasamu SACCO Ltd
95	Suluhu SACCO Ltd
96	Airports SACCO Ltd
97	2NK SACCO Ltd
98	Times U SACCO Ltd
99	Prime-Time SACCO Ltd
100	K-Pillar SACCO Ltd
101	Good Hope SACCO Ltd
102	Magadi SACCO Ltd
103	MMH SACCO Ltd
104	Orient SACCO Ltd
105	Shoppers SACCO Ltd
106	Taraji SACCO Ltd
107	Bi-High SACCO Ltd
108	Strategic DT-SACCO Society Ltd
109	Dhabiti SACCO Ltd
110	Thamani SACCO Ltd
111	Kimbilio Daima SACCO Ltd
112	Nyala Vision SACCO Ltd
113	Wakulima Commercial SACCO Ltd
114	Nafaka SACCO Ltd

115	Vision Point SACCO Ltd
116	County SACCO Ltd
117	Supa SACCO Ltd
118	Jitegemee SACCO Ltd
119	Patnas SACCO Ltd
120	Lainisha SACCO Ltd
121	Golden Pillar SACCO Ltd
122	Siraji SACCO Ltd
123	NRS SACCO Ltd
124	Wevarsity SACCO Ltd
125	Vision Afrika SACCO Ltd
126	Fariji SACCO Ltd
127	Tabasuri DT SACCO Ltd
128	Kenya Achievas SACCO Ltd
129	Baraka SACCO Ltd
130	Ufanisi SACCO Ltd
131	Tenhos SACCO Ltd
132	Smart Champions SACCO Ltd
133	Mudete Factory Tea Growers
134	Puan SACCO Ltd
135	Kencream SACCO Ltd
136	Viktas SACCO Ltd
137	Lengo SACCO Ltd

138	Acumen SACCO Ltd
139	Stawisha SACCO Ltd
140	Dumisha SACCO Ltd
141	Washa SACCO Ltd
142	NyambeneArimi SACCO Ltd
143	Stake Kenya SACCO Ltd
144	Fortitude SACCO Ltd
145	Sotico SACCO Ltd
146	Joinas SACCO Ltd
147	Ndosha SACCO Ltd
148	Lamu SACCO Ltd
149	Kabiyet SACCO Society Ltd
150	Trans Counties SACCO Ltd
151	Ilkisonko SACCO Ltd
152	Nufaika SACCO Ltd
153	Jumuika SACCO Ltd
154	Kipsigis Edis SACCO Ltd
155	Enea SACCO Ltd
156	Ammar SACCO Ltd
157	Kenya Midland SACCO Ltd
158	Baraton SACCO Ltd
159	Kolenge SACCO Ltd
160	Agrochem SACCO Ltd

161	Rachuonyo Teachers SACCO Ltd
162	Nandi Farmers SACCO Ltd
163	Home Business SACCO Society Ltd
164	Jacaranda SACCO Ltd
165	Nexus SACCO Ltd
166	Mwietheri SACCO Ltd
167	Ainabkoi SACCO Ltd
168	Uni-County SACCO Ltd
169	The Apple SACCO Ltd
170	Biashara Tosha SACCO Ltd
171	Koru SACCO Ltd
172	Good Faith SACCO Ltd
173	Vihiga County Farmers
174	Goodway SACCO Ltd
175	Defence SACCO Society Ltd
176	Chuka University SACCO Society Ltd

Appendix III: Data Extraction Sheet 1

	Total Assets	Total Deposits	Core Capital	Earning Assets	Total Gross Loans	Short-Term Liabilities	NPLs	Net Surplus	Liquid Assets
2018									
2019									
2020									
2021									
2022									

Appendix III: Data Extraction Sheet 2

	Total Staff Costs	Other Operating Expenses	Interest on Members Deposits	Dividends on Members	Interest on Income	Other Incomes
2018						
2019						
2020						
2021						
2022						

Appendix IV: Research Authorization



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Our Ref: D86/CTY/28088/2019

Date: 10th May, 2023

The Director General,
National Commission for Science, Technology & Innovation,
P.O. Box 30623-00100,
NAIROBI

Dear Sir/Madam,


RE: RESEARCH AUTHORIZATION FOR PETER N. WANJIRU REG. NO. D86/CTY/28088/2019

I write to introduce Njuguna who is a Postgraduate Student of this University. The student is registered for a Ph.D. degree programme in the **Department of Accounting & Finance in the School of Business, Economics & Tourism**.

Njuguna intends to conduct research for Ph.D. thesis entitled, **"Financial Stability and Financial Performance of Deposit Taking Savings and Credit Co-Operative Societies in Kenya"**


Any assistance given will be highly appreciated.

Yours faithfully,



PROF. ELISHIBA KIMANI
EXECUTIVE DEAN, GRADUATE SCHOOL

JG/cao

Appendix V: Research Permit




REPUBLIC OF KENYA



**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

RESEARCH LICENSE



This is to Certify that Mr. Peter Njuguna Wanjira of Kenyatta 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: Financial Stability and Financial Performance of Deposit Taking Savings and Credit Co-operative Societies in Kenya for the period ending : 31/May/2024.

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343703

Applicant Identification Number

Director General

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