EFFECT OF FINANCIAL RISK ON FINANCIAL PERFORMANCE OF DEPOSIT TAKING SACCOS IN NAIROBI COUNTY, KENYA

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DECLARATION

This research dissertation is my original work and has not been submitted for any other academic award

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This research dissertation has been submitted for examination with my approval as the supervisor

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ABSTRACT

With the continuous aggressive and dynamic competitive environment increment, companies are experiencing financial risk from a multi-dimensional problem. Failure to identify the financial risk will lead to poor performance of an enterprise. Financial risk usually emanates in the process of financial activities, accumulation, and amplification, which finally leads to financial crisis and the inherent collapse of a business enterprise where it ceases being a going concern. The general objective of this research was to determine the effect of financial risk on the financial performance of DT-SACCOs in Nairobi County, Kenya. Specifically, the study aimed at establishing the effect of liquidity risk, credit risk, operational risk, and market risk on the financial performance of DT-SACCOs in Nairobi County, Kenya. The study was informed by three theories namely: loanable funds theory of interest, information asymmetry theory, and the shiftability theory. The study targeted all the DT-SACCOs in Nairobi County, Kenya, and adopted a descriptive survey design. The research utilized secondary data from annual reports of the SACCOs for five years and data was analyzed using STATA software Version 12. Descriptive and multiple linear regression analysis was conducted for the survey. Data presentation was done using tables and charts. The study established that financial risk has a significant effect on financial performance. Thus, financial risk can be utilized in predicting the financial performance of deposit-taking SACCOs in Nairobi County, Kenya. Other findings were that credit risk has a significant effect on the financial performance of deposit-taking SACCOs in Nairobi County, Kenya. Further findings were that liquidity risk has a positive but not a significant relationship with the financial performance of deposit taking SACCOs in Nairobi County, Kenya. Operational risk showed that it has a significant effect on the financial performance of deposit taking SACCOs in Nairobi County, Kenya, and market risk have an insignificant but a positive relationship with the financial performance of deposit taking SACCOs in Nairobi County, Kenya. Recommendations were made to the SACCOs regulator (SASSRA), SACCO practitioners, and consultants to mitigate financial risk in order to augument profitability in the SACCO sector. Further recommendations were made that little focus should be made on market risk and liquidity risks but much focus should be on operational and credit risks which should be mitigated so as to increase the financial performance of deposit taking SACCOs in Nairobi County, Kenya.

DEDICATION

I dedicate this dissertation to my family who have motivated me to scale to this height in my education. Much appreciation to you for your limitless dedication all the way. I am forever grateful.

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OPERATIONAL DEFINITION OF TERMS

Credit risk: this is the risk experienced by financial institutions when the borrower fails to honor their debt obligation as they fall due or upon maturity (Coyle, 2010).

Financial Performance: is the measure of the overall financial health of the firm over a specified time frame and could be leveraged to compare same firms across one industry or sectors as a whole (Business Dictionary, 2011)

Financial risk**:** this is the unanticipated variability in returns and therefore it includes liquidity risk, credit risk, operational risk and market risk (Holton, 2004)

Liquidity Risk: is the exposure of an entity not being able to meet he debts owed to the depositors and or fund increase in assets without paying unwarranted costs or incurring losses (Ismail, 2010)

Market Risk: is the risk of institution as a result of movements in market price such as changes in interest rates, foreign exchange rates and commodity and equity prices (Worzala, 1995)

Operational Risk: this is the risk that would produce volatility in banks' reserves, value of entity and expenses, which is a loss emanating from failed internal processes, systems, individuals or external events (Commonwealth Bank of Australia, 1999)

ACRONYMS AND ABBREVIATIONS

CSE	-	Calabasca Stock exchange
DT-SACCOS	-	Deposit Taking Saccos Society
GMM	-	Generalized method of moment
MFI	-	Micro Finance Institutions.
OLS	-	Ordinary Least Squares Method
SACCOS	-	Savings and Credit Co-operative societies
SASRA	-	Sacco Societies Regulatory Authority
SPSS	-	Statistical Package of Social Science Software
VIF	-	Variance inflated factor

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CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Financial risk is the unanticipated volatility of financial performance (Holton, 2004). Financial risk includes credit, market, and liquidity risks, which cumulatively result in the volatility of returns (Dimitropoulos et al., 2010; Tafri et al., 2009). Financial Risk is an overall term used to describe various types of risks relating to financial transactions and can be caused by differences in currency rates, interest rates, differences in liquidity and market prices affecting cash flows, and thus the financial performance of organizations (Al-Tamini, 2007). Financial risk is any kind of activity that can lead to possible loss of funds by businesses (Njogo, 2012).

Dealing with risk is a crucial duty that needs to be undertaken once it is identified. Financial risk has three components as per the statement of financial position, they include; capital structure risk coming as a result of using debt capital to finance part of firm's assets, liquidity risk which is due to company's ability to its short term liabilities by use of assets that can be converted into cash quickly, and long term liability influenced by finance sources used in buying long term assets (Blach, 2010). Risk can be determined by such methods as creditworthiness, financial leverage analysis, and behavioral models which considers how managers' behavior influences performance by the assumed risk (Shapira, 2002).

The Basel Committee (2002) defines credit risk is the likelihood that a bank borrower will be unable to meet its obligation as per the terms agreed on. Liquidity risks are attributed to inadequate funds for normal operation requirements which reduces the ability of the financial institutions to meet its obligations once they fall due. Market risks are risks that come from assets and instruments traded in well-articulated markets. Al-Mazrooei and Al-Tamimi (2007) indicate that in the changing environment, financial institutions are exposed to different risks like liquidity risk, credit risk, operational risk, market risk, interest rate risk, and others that could create threat to their success and survival.

Deregulation has been the main accelerator of the changes in the financial market that have a strong effect on risk management. In the early 1970s, the deregulation of capital flows resulted in augmented globalization (Van Dijk & Sverrisson, 2000). The deregulation of the sector promoted the rapid expansion of new firms like Enron (Bratton, 2003) and deregulation of financial practices occasioned new risks that saw insurance companies and some banks offering insurance services writing credit and market directives (Broome & Markham, 2000)

In the last two decades of the 20th century, several nations constituting developed, growing, and least developed economies experienced different banking setbacks necessitating for a mandatory transformation of their financial systems (IMF, 1998). As the financial sector continued to adopt innovations, the array, and intensity of risks that the practitioners were vulnerable to also grew proportionately. Thus, to ensure the expansion of the financial sector does not put at risk its stability, management of risk is critical. Thus, the current main activity of financial institutions is to identify and manage financial risk (Mudge, 2000).

A survey of the major financial institution in the US carried out in the year 1995, revealed that at least 90 percent of the financial institutions utilize financial engineering techniques in the management of market risks that are attributed to inconsistencies in interest rates, foreign exchange rates, or prices (Bodnar et al.,1996). Despite the variation of risks as encountered by managers from different industries, certain common factors inform the rationale for the utilization of derivatives and financial engineering techniques. For instance, financial institutions are capable of transferring credit risk and payment delays between producers and other outside investors. Global concerns on financial risk are ever-increasing. Consequently, organizations of all types and sizes endeavor to advance comprehensive financial risk management structures that meet the compliance demands. An elaborate framework for evaluation of the company's returns and risk across different financial activities is vital in assessing the benefits of possible mergers among financial institutions.

Over the Counter (OTC) financial markets have in the recent past experienced exponential growth. However, there was a global decline in capitalization during this time frame. Consequently, in the early 1980s, specific financial institutions, disregarding nationalized financial institutions became

vulnerable (Alexander, 2005). Accordingly, the regulation and supervision of financial institutions were shored up. Particularly, the requirements of capital adequacy have been expounded to integrate more risks as opposed to the initial Basel 1 Amendment which only covered market risks. Further, the Basel 1 redraft in 1996 stretched it to market risks while the Basel 2 Accord which was embraced by all G10 and other nations in 2007, refined credit risk to risks and extended the computation of risk by including operational risk (Alexander, 2005)

An organization's financial performance entails its ability to grasp investment and operational decisions together with strategies to attain its financial stability. It is the measurement of the organization's attainment of its financial objectives, which are informed by its financial goals (Grier, 2007). Thus, financial performance is defined as the results of an organization's strategies and procedures within a given time frame in economic relations. The outcomes are stated in terms of yields or losses (Heremans, 2007). Accordingly, the financial performance is the ratio of the degree of gains or losses of an organization in a given period (Murthy & Sree, 2003). Financial performance is impacted by numerous factors like rivalry, financial risk, asset quality, the market share an organization controls, interest rates, the level of technology adopted by the organization, levels of regulation, and the level of capital that the organization controls. SACCOs differ in size, capital, and the number of branches with banks opening outlets and subsidiaries in additional nations. This will tend to vary the financial performance of the various SAACOs (Alexandru, Genu & Romanescu, 2008). Saccos operate under financial risks such as credit risk, liquidity risk, operational risk, market risks among others of which if not managed properly may lead to the collapse of the SACCOs (SASRA 2018).

With the continuous dynamic competitive environment increment, firms are experiencing financial risk from a multi-dimensional problem. Failure to identify the financial risk will lead to the poor performance of an enterprise. Financial risk usually emanates in the process of financial activities, accumulation, and increment, which finally leads to financial crisis and the inherent collapse of a business enterprise where it ceases being a going concern (Ginoglou et al, 2002).

Financial risk results in poor financial performance if poorly managed (Demirguc-kunt & Huzinga, 2000). Financial crises are of magnitudes of unplanned eventualities and inflict long-term

repercussions on people, economies, and countries (Alexander, 2005). The global crisis that affected almost all the economies in 2007-2009 brought about the need to think about approaches to be implemented by the financial institutions to evaluate their performance (Basel 2001). Hence, it was important to consider the key variables that may affect the financial performance of financial institutions like adequacy of business models with regards to risk levels and how it is handled. Therefore, it is necessary to carry out benchmarks and sensitivity analysis so as to come up with the actual ability of the financial institutions in dealing with unfavorable market conditions and mitigate the impacts based on their business strategies and their rate of risk tolerance.

Harrington and Niehaus (2003) state that risks from a business point of view is the exposures that reduce future net cash flows and may result in losses. According to Dickinson (2001), risks are chances that the firms' returns may differ from the firms' objectives. Risk management is a step-by-step procedure that is done by an organization to lower its likelihood of loss as much as possible. Indeed risks cannot be fully eliminated, but with the right process, they can be minimized.

Rejda (2011) shows that risk management involves the identification of risks, analysis of risks, taking appropriate measures to reduce the risk exposures, and implementing the controls, and monitoring the risks management framework. Nawai and Shariff (2010), states that there is a close relationship between borrowers and the SACCOs and for this reason, early detection of financial risks is possible as risks do not operate singly but the confluence of all risks that affect SACCOs' performance.

According to Archer & Karim (2012), NPLs are rising owing to poor risk management strategies, which jeopardizes the financial performance of financial institutions. Further, Gizycki, (2001) proposes that constrained asset ratios of small banks are inclined to vary more than those of larger banks. A Deloitte (2013) report revealed that foreign banks exhibiting small asset bases within Australia witnessed a high degree of low and varying profits from 1990 to 1992.

Despite Sub-Saharan Africa (SSA) witnessing considerable improvements in economic growth, informational efficiency, and in some cases, political stability, proper financial risk management for corporations, especially financial institutions, remains the major priority. Despite efforts to formalize and improve the utilization of local capital, interest rates, and progress of the currency

markets remains quite sluggish in this zone which is further constrained by regulatory, legal, and other forces. These markets' illiquidity is aggravated by the reality that financial institutions are not enthusiastic about absorbing significant illiquid risks, while there being almost no supplementary markets to lay the risks off (Deloitte, 2013).

Akotey et al. (2012) undertook a study in the Brong Ahafo state of Ghana and ascertained that credit risks have a strong impact on the profitability of community and rural banks. Onaolapo (2012) ascertained that the efficiency of CRM among the Nigerian commercial banks for the years 2004 to 2009 provided a deeper insight into credit risk as a key accelerator of profit generation.

The financial sector is highly crucial in terms of the allocation of funds due to its intervention in the transfer of funds from surplus to deficit unit. During the execution and sustenance of these functions, the anticipated financial performance may be achieved despite high financial risks. The Kenyan financial sector is vulnerable to different risks, which emanate from both the external and internal environments. Financial risks threaten the financial liability and performance of financial institutions in Kenya. The risk being the probability that the outcomes, anticipated or unexpected, may have a major effect on the earnings and capital earnings of financial institutions (Eken et al., 2012; Ongore, 2013).

In Kenya, the subject of risk management has generated significant heed among the different stakeholders and also scholars. Subsequently, the Central Bank of Kenya (CBK) administered a survey on risk management in the Kenyan banking sector in 2004 during the month of September. The purpose of the study was to ascertain the local banking sector's needs for the management of risks. The study was agitated by the need to embrace a Risk-Based Supervision (RBS) and integrate the best practices of international risk management as envisaged in the 25 Basel Fundamental Principles for Effectual Supervision of Banks. The study resulted in the incorporation of Risk Management Guidelines (RMGs) in the year 2005 and the formulation of Risk-Based Supervision methodology for supervision financial institutions in the same year. This prompted commercial banks to upgrade their risk management systems (CBK, 2005). Consequently, in 2015, the Sacco Societies Regulatory Authority (SASSRA), which is the regulatory body for SACCOs in Kenya, issued RMGs for deposit taking SACCOs (SASSRA, 2015).

1.1.1 Financial Risk

According to Jorion and Khoury (1996), a financial risk arises due to losses in the financial markets as a result of changes in financial factors. It is analogous with the likelihood that liabilities and obligations cannot be adequately met using the available current assets. Financial institutions such as banks and SACCOs experience common risks for instance credit risk, pricing risks, market risks, liquidity risk, strategic risks, operational and legal risks (Bodily & Bruner, 2002; Bratton, 2003).

When a business enterprise is exposed to financial markets, the odds suffering a loss but there are also avenues for attaining profit. Exposure to the financial market may provide strategic benefits. The benefits of proper management of financial risk are as important as those of implementation of a risk management policy since financial risks are a component of the firm's risks. One of the fundamental prejudice is to reduce the changes in earnings as a result of financial risks (Dhanini et al., 2007).

Kenyan SACCOs tackle several risks daily including operational, strategic, compliance, business, and financial risks. Financial risk in SACCOs is a possibility that the outcomes of an undertaking could result in an adverse impact on the firm. This could lead to a reduction in earnings, capital, or impose impediments on the SACCOs' ability to meet its objective of mobilizing savings and provide credit to members. The financial risks facing SACCOs are credit risks, market risk, liquidity risks, and operational risks among others (Maina, 2007).

Liquidity risk should be appreciated as SACCOs often face liquidity problems not only because they lack access to the Central bank, as the final resort lender like the commercial banks but also they do not understand the determinants of these risks (Jazayeri, 2008). Hence risk arising liquidity shortage is a major cause of the failure by most SACCOs.

1.1.2 Financial Performance

Meigs (1978) defines financial performance as the degree to which the firm's financial objectives are being realized through measurement of results of the policies of the firm in monetary terms.

This is executed by analyzing productivity, liquidity, profitability, cash flows, working capital, and social performances. However, profitability ratios are the most adopted unit of measurement (Eshna, 2012).

It is essential to determine the condition and the performance of the SACCO. The financial performance of a firm is the degree of the organization's turnover or losses within a given time frame. It determines the capability of the SACCO administration to make revenue by employing the firm's capital at its discard. Furthermore, it displays how competently the assets of the organization are used to make revenue. Moreover, it shows the efficacy of the administration of the organization in making revenue from the assets of a firm (Khrawish, 2011).

Numerous approaches have been utilized to quantify the momentary presentation of commercial banks. Functional and financial ratios are applied for finding the state and performance of an organization (Ogilo, 2012). Some of the ratios include; ROE, Net Interest Margin, and ROA. ROE entails the amount of profit made by a firm makes equated to the whole sum of stockholder equity capitalized or established in the company's capital structure. Khawish (2011) states that ROE is calculated as the net income after taxes over total equity capital. ROA ratio specifies the bank's profitability, it is the ratio of the net income to some asset. Net Interest Margin measures the difference between the interest revenue yielded by the banks and the interest expenses, relative to the amount of the bank's interest-earning assets (Gul, Irshad & Zaman, 2011). The research used ROE and ROA to measure SACCO performance.

In 2018, the total assets of DT-SACCOs increased by 11.97% in 2018 to reach 495.25 billion which was primarily composed of loans and other credit advances which grew by 13% to reach 374.28 Billion from 331.21 billion recorded in 2017 (SASRA, 2018). According to the agency theory, the shareholders anticipate high returns for their investments and therefore the management of SACCO should work harder to produce optimum returns to reward the members through the issuance of dividends (Kimari, 2013).

The revenues realized by SACCOs should cover their operating costs plus other costs and yield profits. DT-SACCOs are introduced so as to improve the members' financial well-being (SASRA,

2018); hence it is of importance to examine the financial trends and the haddocks faced by the SACCOs

1.1.3 Deposit Taking Saccos in Nairobi County Kenya

The core goal for the existence of SACCOs is to accord members the opportunity for accumulating their savings and deposits and create a source of funds from which they can borrow from. Kenyan SACCOs are regulated by the Cooperative Societies Act (Cap 490), which regulates all types of SACCOs. SASRA is the supervisory body for DT-SACCOs and regulates most of its activities.

SASRA is a regulatory body under the ministry of industrialization and Enterprise Development that was instituted after the introduction of the (SACCO Societies Act No. 14 of 2008) and commenced operations in 2009. Its functions are regulation, supervision, and licensing of DT-SACCOs in Kenya. SASRA was created so as to protect the SACCO members' interest and improve the trust of the public in SACCOs. The state also sought to mobilize domestic savings and increase economic growth in the long run. SASRA has developed regulations on management of member's funds, reporting, maximum and minimum ratios, and loan classification (SASRA, 2018). SASRA had licensed 175 DT-SACCOs to operate in Kenya and Nairobi County by the end of 2018 and there are 46 DT-SACCOs.

1.2 Statement of the Problem

Financial institutions and their volatility in performance have major consequences on a nation's economy (Bohnstedt, 2000). Practically, the transactions of financial institutions are highly sensitive since more than 85 percent of their liabilities are deposits from clients (Saunders & Cornett, 2005). The global financial services sector presently experiences challenges such as customer retention, compliance risks, financial risks, technological risk, and strategic risks among others. Risks exposures can reduce future net cash flows and may result in losses. The firms' returns may differ from the firms' objectives (Harrington & Niehaus, 2003; Dickinson, 2001).

The financial performance of the Kenyan DT- SACCOs have been on the decline as shown by their ROA and ROE values. As per the SACCOs report of 2018, NPLs increased from 6.14% in 2017 to 6.30% in 2018 showing an increase in credit risks. The liquidity ratio reduced from 54.10%

in 2017 to 52.68% in 2018 showing a decline in liquidity giving rise to liquidity risks while the operating expenses to total asset ratio reduced from 5.29% in 2017 to 4.62% in 2018 signaling a decline in operational risk (SASRA, 2019). Thus, there has been an increase in liquidity and credit risks with a simultaneous decline in financial performance. It is imperative to investigate whether these risks have a bearing on financial performance. It is vital to ascertain the relationship because if financial risk impacts financial performance, then these risks if not addressed properly by SACCOs may have implicative effects on financial performance which eventually see most of cease operations.

The research revealed mixed results on the impact of financial risks on financial performance from both international and local studies reviewed. Akindele (2012) researched on risk management and financial performance of Nigerian banks listed in the Nigerian Stock Exchange and concluded that good risk management policies improve corporate performance, Oluwafemi et al. (2014) studied risk management and financial performance of banks in Nigeria and established a positive association between financial risk and financial performance. Muriithi et al. (2017), studied examined the effect of liquidity risk on the financial performance of commercial banks in Kenya and found out that financial risks have a negative impact on the financial performance of commercial banks in Kenya**.** Amambia, Kalio, and Kwasira (2013) researched on the impact of management of financial risk on the performance of Kenya Power and Lightening Company and established that financial risk largely influences the company's financial performance. Gongera and Were (2013), explored the effect of financial risks on the profitability of Kenyan sugar companies and established that there is a strong negative association between the firm's risk and profitability. Lelgo and Obwogi (2018) surveyed the effect of financial risk on financial performances of Kenyan microfinance institutions and had mixed findings that the association between exchange rate risk, liquidity risk, and financial performance is positive. These studies portray dichotomous results on the effect of financial risks and financial performance and which calls for the need for further research.

Akindele (2012) researched on the influence of risk management and corporate governance performance of Nigerian banks listed in the Nigerian Stock Exchange and relied on Muriithi and Waweru (2016) to determine the effect of liquidity risk and financial performance of Kenyan

commercial banks. Lelgo and Obwogi (2018) delved into the effect of financial risk on Kenyan microfinance institutions' financial performance. These studies have not evaluated the effect of financial risk on the financial performance of deposit taking Saccos. There has also been no study reviewed ascertaining the effect of financial risk on the financial performance of SACCOs, thus outlining a conceptual gap. Therefore, to fill the prevailing gaps, this research aims to determine the effect of financial risk on the financial performance of deposit taking Saccos, in Nairobi County, Kenya.

1.3 Research Objectives

1.3.1 General Objective

The broad study objective was to examine the effect of financial risk on the financial performance of deposit taking Saccos, in Nairobi County, Kenya.

1.3.2 Specific Objectives

1. To determine the effect of credit risk on the financial performance of deposit taking SACCOs in Nairobi County, Kenya
2. To examine the effect of liquidity risk on the financial performance of deposit taking SACCOs in Nairobi County, Kenya
3. To establish the effect of operational risk on the financial performance of deposit taking SACCOs in Nairobi County, Kenya
4. To assess the effect of market risk on the financial performance of deposit taking SACCOs in Nairobi County, Kenya

1.4 Research Questions

1. What is the effect of credit risk on the financial performance of DT- Saccos in Nairobi County, Kenya?
2. What is the effect of liquidity risk on the financial performance of DT- Saccos in Nairobi County, Kenya?
3. What is the effect of operational risk on the financial performance of DT- Saccos in Nairobi County, Kenya?

4. What is the effect of market risk on the financial performance of DT- Saccos in Nairobi County, Kenya?

1.5 Justification of the Study

The study is of great importance to the following:

1.5.1 Financial Analysts

Financial analysts are in charge of advising investors, from the findings of this research they will be able to give sound information that will lead investors to make informed decisions. Information on interest rates may assist financial analysis plan well on when to invest and maximize returns.

1.5.2 Fund Managers

The fund manager's main responsibility is to identify viable projects and demonstrate to investors. The study's results will help them determine the performance of the various deposit taking Saccos in the markets which will enable them to decide on whether to invest or withdraw their investments in the Saccos.

1.5.3 SASRA

SASRA as a regulator and policymaker will observe the trends and make policies in line with the prevailing information in the markets from the research to influence future trends.

1.5.4 Researchers

The findings of this research are aimed at adding knowledge of the DT-SACCOs concerning the effect of financial risks on the financial performance of DT-SACCOS in Kenya and provide possible research gaps. The researchers will be able to critic and come up with current findings on improvements made on DT-SACCOS both locally and internationally.

1.6 Scope of the Study

This study's scope was confined to exploring the impact of financial risk on the financial performance of deposit taking SACCOs in Nairobi County, Kenya. The study majorly focused on credit risk, liquidity risk, operational and market risks. The study covered 5 years, from 2014 to

2018 in which all the licensed deposit taking SACCOs in Nairobi County, Kenya were in operation.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This section contains the theoretical and empirical literature for the study. It focuses on the theoretical review, which focuses on the theories of financial risk, the conceptual framework, conceptualization of the variables, which specified how the variables were measured, the empirical review undertaken by other researchers, the critique of the empirical literature, and the research gap.

2.2 Theoretical Review

2.2.1 Loanable Funds Theory of Interest

Dennis Robertson and Bertlin Ohin formulated the theory in 1930. The theory states that interest rate is dependent on the supply and demand of the loanable funds, where loanable funds are all types of credit including loans, bonds, or saving deposits (Wicksell & Robertson, 2003). The theory asserts that the demand for loanable funds arises for purposes of Investment, dissaving, and hoarding.

This theory stipulates that the interest is computed based on the demand and supply of the loanable funds available in the capital Market (Bibow, 2000). According to this theory, in the long run, the interest rates are a precursor of both savings and investments while short-term interest rates are computed based on the financial conditions that prevail in the economy. Interest rates are key in influencing commercial banks' borrowers. Tightening monetary policy results in a hike in interest rate, which affects demand for loans, (Bernake, 2000).

Wicksell defined this principle by explaining the difference between the interest rate on money and the natural interest rate, which is conventional in the universal monetary theory which has replaced the Keynesian theory. According to Friedman (1968), the difference between the market interest rate and the natural interest rate is appropriate in expounding the implications of monetary policy. On the other hand, the central banks use the Winksellian perspective to allude that monetary policies can only impact interest rates in the short-run while real factors determine long-run interest rates.

The loanable funds' theorists argue that higher savings through lower deficits and lower consumption would result in lower interest rates, higher credit supply, more investments, and hence a higher capital stock and a more future income (Lindner, 2013). The demand for loanable funds emanates from firms that wish to invest. As the interest rate declines, the number of profitable projects rises and therefore, the funds' demand curve will shift down from left to right. The loanable funds supply emanates from savings. If individuals must save, they will require reward interest to compensate for the foregoing consumption. When the interest rate is high, individuals will be advised to save and lend. Therefore, loanable funds' supply curve slopes upwards. The borrowed amount is inversely associated with the interest rate while the quantity lent is directly linked to the interest rate (Mishkin, 2004).

This study used this theory to show how credit risk influences the financial performance of DT-SACCOs because if there a rise in the interest rate on borrowed funds, borrowers will not be able to meet the costs, hence chances of default on loans leading to an increase in credit risk consequently low financial performance.

2.2.2 Information Asymmetry Theory

Joseph Stiglits (1976), George Akerlof (1970), and Michael Spence (1973) advanced the theory. Asymmetric information is a situation in the financial markets where the borrower is more conversant about his financial state than the lender leading to market failure (Schrand, 2007). In a perfect market where there exists perfect information to both players at no cost and there exist no uncertainties concerning current and future trading conditions, the parties do not experience information asymmetry. Nevertheless, in the actual world, information is never perfect, and also the small business finance market is faced with risk and uncertainty associated with future conditions. There exists information asymmetry between the lender and the borrower. From the lender's point of view, the information is inadequate in conjunction to project quality and small firms' management leading to adverse selection (Stiglis and Weiss, 1981).

Also, the small firm's management could fail to utilize their full potential resulting in a moral hazard which could be very costly for lenders especially banks to appropriately monitor the projects of small firms, thus leading to equilibrium credit rationing and fallout in finance provision,

Bester (1987). The overall problem of information asymmetry can display itself either in acceptance of loan application but greater than the risk of adjusted interest rate, but with an instant rejection of loan application or strict collateral requirements (Stiglitz,1981), (Bester,1987).

According to Wilson (2008), adverse selection is a terminology that refers to a process whereby unanticipated outcomes occur when sellers and buyers are faced with information asymmetry. This imperfect information makes the quantity and price of goods or services in the market shift leading to 'bad' products or services being chosen. Asymmetric information also leads to moral hazard, which is a situation where a party will take risks because the cost that can be incurred will not be felt by the risk-taker. A moral hazard further occurs if one party is safeguarded from risk and has more information regarding its actions than the party paying for the negative repercussions.

The level of information asymmetry is a matter that results in both speculation and hedging by a firm since information asymmetry is highly correlated with financing costs, firm quality, and firm evaluation. Studies by Breeden & Vinswanathan, (1996), show that firms with a higher level of asymmetric information are highly likely to hedge to reduce the uncertainty that is beyond the manager's control.

However, Ljungqvist (1992) opines that when the extent of information asymmetry is too high, small corporations would exhibit the most incentive, since the bankruptcy option is highly valued by the firms. Sapra &Shin (2008), argue that reducing asymmetric information through disclosure of derivatives induces speculation.

This study used information asymmetry theory to understand the influence of credit risk on financial performance by deposit taking Saccos. Deposits taking Saccos refer to financial intermediaries and thus risk giving loans to members who may not be honored due to moral hazard on part of the borrower and adverse selection on the part of the deposit taking Sacco.

2.2.3 Shiftability Theory

The model was pioneered by Moulton (1918) and recommends that banks invest part of their funds in loan portfolios and securities that have a secondary market. When liquidity need arises, the said

assets can be sold at the market concerned. This theory prolongs the average maturity period of loan portfolios and promotes the growth of the government security market.

Authors such as Herbert and Dodds further expounded the theory. It states that the bank's liquidity will be upheld if it possesses assets that could be sold for cash to other investors or lending companies. Assets' shift ability is the ability of the financial resources to be transferred among individuals or banking institutions at negotiable prices. According to the shiftability theory, any bank's liquidity depends on the ability to transfer assets to another individual at the agreed price. This model is anchored on the presumption that the liquidity of the bank will be upheld by keeping assets with resale value or shifting to other institutions for cash at shorter notices. The attentiveness of banking is mostly attended well if these assets could be shifted to enable it to quickly achieve liquidity as the need emanates. Kenyan banks have widely adopted the shiftability theory which subjects their resources into worthwhile investments such as government securities as well as other marketable securities. According to the shiftability theory, commercial loans should not be termed as bank assets but rather as not the only suitable assets (Herbert, 1949)

This theory seeks to attract the attention of bankers both credit and investment to improve the bank's liquidity. It is recommended that banks maintain a portfolio that constitutes short-term open market investments. If short-term investments are maintained, banks will easily meet withdrawal demands by the customers. For repayable loans, the collateral security could be sold in the market at their initial prices or discounted by the central bank. The conversion of an asset into money through shiftability or sale reduces the transaction costs of both money holders. The description of an asset as shiftable is viewed as a simplistic act and the extent to which it can be transferred to an institution or person (Mutton, 1939).

The shiftability theory presumes that an asset should not only be tied to self-liquidating bills, but also other forms that are transferrable in open markets such as government securities (Moti, Sindani, Mugenda &Masinde, 2012). The shiftability theory takes a perspective that is more general with regards to the banking business by increasing the category of assets presumably owned by the bank. The reason behind the use of the shiftability theory arises from the fact that

the bank's liquidity depends on its capacity to shift its ownership to another individual at predictable prices.

Hosna and Manzura (2009) purport that the shiftability had a profound effect on banking practices as it shifted the bankers' attention and the banking agencies from loans to investments for bank liquidity purposes. It also argued that the liquidity of short-term commercial loans was largely fictional in any case.

According to Kargi, (2001), as per the commercial loan theory, the shiftabilty theory had flaw- although the bank could reach the required liquidity via shifting its assets which were not true of all banks taken together. But this was well understood by the writers on the subject as it did in the bank management practices attributed to the theory.

This study used this theory to explore the influence of liquidity risk on the financial performance of DT Saccos in Nairobi County using liquidity reserves and liquid investment ratios. It will also provide information on whether liquidity held by the DT-SACCOs affects the returns expected by the shareholders. It also justifies that not just by holding the minimum liquidity required, SACCOs can base their liquidity on market conditions and their ability to sell their assets.

2.3 Empirical Review

2.3.1 Credit Risk and Financial Performance

Mogga (2018) did research on the effect of credit risk management on the financial performance of commercial banks in Juba, South Sudan. Secondary data was retrieved from banks' annual financial reports for a period between 2000 and 2012. The survey established that the majority of the banks considered the identification of risks as a process in credit risk management which influenced financial performance. The research established that risk identification has a negligible effect on the bank's financial performance while risk analysis influenced the commercial bank's financial performance to a small extent. Risk monitoring, on the other hand, influenced financial performance to a large extent while credit approval was a strong factor impacting commercial banks' performance.

Luqman (2014) investigated the effect of credit risk on Nigerian commercial banks' performance between time frame 2008 and 2012. The survey retrieved data from journals and annual reports. The survey showed that the loan ratio plus advances to total deposits negatively influences profitability although insignificant while the ratio of NPLs to loans and advances negatively influences profitability. The investigation also showed that there exists a strong linkage between performance interims of CRM and profitability with regards to loan performance.

Li and Zou (2014) executed a survey on the influence of credit risk management on the profitability of the commercial bank in Europe. The credit risk management measures were ROE and ROA whereas the Capital adequacy ratio and NPL ratio are described as the parameters CRM. The sample was 47 biggest commercial banks in Europe between the time frame 2007 and 2012 and formulated four hypotheses regarding the research questions. Statistical tests were conducted to test the existence and stability of relationships. The findings revealed that there is a negative association between CRM and commercial banks' profitability. Between the two credit risk management proxies, and NPLs ratio has a strong impact on both ROA and ROE while Capital Adequacy Ratio has a negligible impact on both ROA and ROE.

Kolapo et al. (2012) delved into the effect of credit risk on profitability in Nigeria for the years 2000-2010. Profitability was measured using ROA to compute the ratio of NPL to advances and loans (NPL/LA). The profit function was determined using a panel model analysis. The results indicated that the effect of credit risk on the performance of the bank as measured using ROA of banks exhibit a cross-sectional invariant trend. The same results were established by other researchers as Tenguh and Achou (2008) and Musyoki and Kerubo (2011).

Poudel (2012) investigated to examine the impact of credit risks on the profitability of commercial banks in the case of Nepal. Capital adequacy, default rate, and cost per loan assets were the parameters used. Secondary data was used from the financial reports of fifteen banks for eleven years from 2001 to 2011. Regression and correlation models were used for data analysis and the results revealed that all the indicators had an opposite effect on the financial performance of the bank.

Essendi (2013) examined the effect of credit risk management on the loan portfolio among SACCOs licensed by SASRA, a case of Nairobi County. The descriptive survey design was adopted targeting all the 106 licensed SACCOs. The sample size selected was 35 SACCOs where both secondary and primary data were collected which was analyzed using descriptive statistics and regression analysis. Results indicated that all SACCOs had adopted a management policy concerning loan risks. It was evident from all the studied SACCOs that they had incorporated various contributions from different stakeholders during the process of formulation of appropriate credit policies.

Ndwiga (2010) explored the effect of credit risk management practices on the financial performance of Kenyan licensed microfinance institutions. An inferential statistic was used to measure the relationship and the financial performance of MFIs, MFIs' financial performance was measured by their profitability. The study concluded that Kenyan MFIs have adopted different CRM practices such as risk monitoring, identification of risk, risk analysis, and risk assessment. The outcome was that there is a positive association between credit risk management and financial performance of Kenyan MFIs.

2.3.2 Liquidity Risk and Financial Performance

Sohaimi (2013) undertook an exploration to analyze liquidity risks and disclosures and to establish the association between liquidity risks and financial performance of banking systems in Malaysia. Financial performance indicators are deposits, liquidity gaps, cash, and NPLs. Data were retrieved from journals, books, and financial reports by Bank Negara Malaysia for the years 1997-2012. The research applied multiple regression to explore the impact of liquidity risk on the capital and reserve of the bank. The study concluded that liquidity risk influences the banks' capital reserve to a large extent, with NPLs aggravating the liquidity risk.

Hakimi and Zaghdoudi (2017) explored the impact of liquidity risk on bank performances in Tunisia. A sample of 10 banks was used between the time frame 1990 and 2013. Panel data was used to analyze the random effect model. Prior findings revealed that liquidity risk impedes banks' performance to a large extent. Further, the results show that inflation and the international financial

crisis have a negative impact on the bank's performance. But the influence of the other bank elements, for instance, capital adequacy ratio, size, and credit risk are insignificant.

Waweru and Muriithi (2017) assessed the effect of liquidity risk on the financial performance of Kenyan commercial banks. All the commercial banks existing between the time frame of 2005 and 2014 were examined. The study used a liquidity coverage ratio over the net stable funding ratio for the measurement of liquidity risk while ROE was used as the parameter for financial performance. Secondary data were retrieved from the commercial banks' financial records as per Central of Kenya records.

Panel data techniques of generalized method of moments and random effects estimation were utilized to remove time-inconsistent unnoted firm-specific impacts and to reduce the occurrence of endogeneity problems. Results indicated that the net funding ratio is negatively related to the profitability of the bank both in the short-run and long-run while liquidity coverage ratios have no impact on the financial performances of Kenyan commercial banks short-term and in the long term.

2.3.3 Operational Risk and Financial Performance

Okeke, Aganoke, and Onuora (2018) undertook research to examine operational risk management and firm performance using chosen banks in Edo estate, Nigeria. The survey aimed at investigating the impact of process risk, people risk, technology, and system risk, and the external risk variables on organization performance. The study employed both correlation and descriptive statistics to analyze data upon a sample of 386 cases. The hypothesis was tested using multiple regression analysis methods. The survey established that an individual's risk variable had a negative significant effect on performance in the region. The process risk variable had a negative impact on performance, technology, and system risk had a strong negative impact on banks' performance. Similarly, the external risk variable had a positive insignificant influence on banks' performance in Edo state. It was inferred from the study that there exists a strong negative impact between operational risk management and bank performance in Edo state.

Meshack and Mwaura (2016) carried out research to establish how operational risk management practices influenced Tanzanian commercial bank financial performance. The study used the

descriptive design to study the research problem and the study's population was all Tanzanian commercial banks. The outcome inferred that the insolvency risk, operational efficiency, and credit risk had an impact on the financial performance during the time frame.

Musiega, Clive, and Siminyu (2017) carried out an investigation to ascertain the impact of operational risk on the financial performances of Saccos in Kakamega County. The population was all the four DT- Saccos in the selected study area. The findings were fed into the SPSS computer package and analyzed via descriptive statistics standard deviation and mean. The data was presented with the aid of bar graphs, tables, and frequencies. The study established that there exists a strong positive linear association between financial systems and the financial performance of deposit taking SACCOs in Kakamega.

2.3.4 Market Risk and Financial Performance

Kassi, Rathnayake, Louembe, and Ding (2019), carried out a study to examine the effect of market risk on the financial performance of 31 non-financial firms quoted in Casablanca Stock Exchange in Morrocco for a period frame between 2000 and 2106. ROE, Profit margin, and ROA were used as the parameters of measuring financial performance. The extent of financial leverage, gearing ratio, and book to market value was used to measure the market risk. They used the OLS model, the fixed-effect model, the random effect model, and the system GMM models. The findings revealed that various market risk measures have a strong negative impact on firms' financial performances.

A study by Kolapo and Fapetu (2015) delved into interest rate risk and performance of Nigerian deposit money banks (DMBs) between the time frame 2002 and 2011. ROA was used to measure performance while interest rate risk indexed was measured using average lending ratio and interest rate diversity. The research used fixed-effect regression analysis and results revealed that each measure of interest rate risk has an insignificant effect on bank performance.

Zainol and Kassim (2010) studied the impact of changes in the interest rate on the return rate of Islamic banks and the level of deposits in the traditional Malaysian Islamic banks. Data collected between the time frame 1997 and 2008 was used and showed that the return rate of Islamic banks

and traditional interest rates of the bank exhibit a long-run equilibrium and possess some bi-directional causality among them. Again, the deposits and rate of return of Islamic banks respond strongly to variations in the traditional interest rates implying that when the interest rates of conventional banks increase, there will be a transfer of funds to traditional banks from Islamic banks.

Muriithi, Muturi, and Waweru (2016) conducted a survey to explore the impact of market risk on financial performances of Kenyan commercial banks existing between the time frame 2005 and 2014. The indicators of market risk included financial leverage, foreign exchange, and interest rates vulnerability while measures such as ROE were utilized to assess financial performance. The study used financial ratios and balance sheets components for the 43 registered Kenyan commercial banks. Generalized method of moment (GMM) random effects and fixed effects estimation were utilized reduced time-invariant unnoticed firm-specific effects and reduce any probable endogeneity problems. The regression coefficient was ascertained using the F-test while R^2 was employed to ascertain the extent of change in the dependent variable attributed to the independent variables. The findings revealed interest rate, that there exists a negative link between financial leverage and foreign exchange on bank profitability.

2.4 Research Gap

From the literature and empirical review, most studies have been done in the developed nations and majorly focusing on either all commercial banks or those listed in the stock exchange with very little attention given to DT-SACCOs. Therefore, this research is intended to fill the gap of inadequate information and understanding that exists concerning the financial risk and financial performance of the DT-SACCOs Nairobi County, Kenya. As presented in the previous research findings, there is inadequate research as to whether various financial risks have an influence on the financial performance of DT-Saccos, in Nairobi County, Kenya.

2.5 Conceptual Framework

Independent Variables **Dependent Variable**

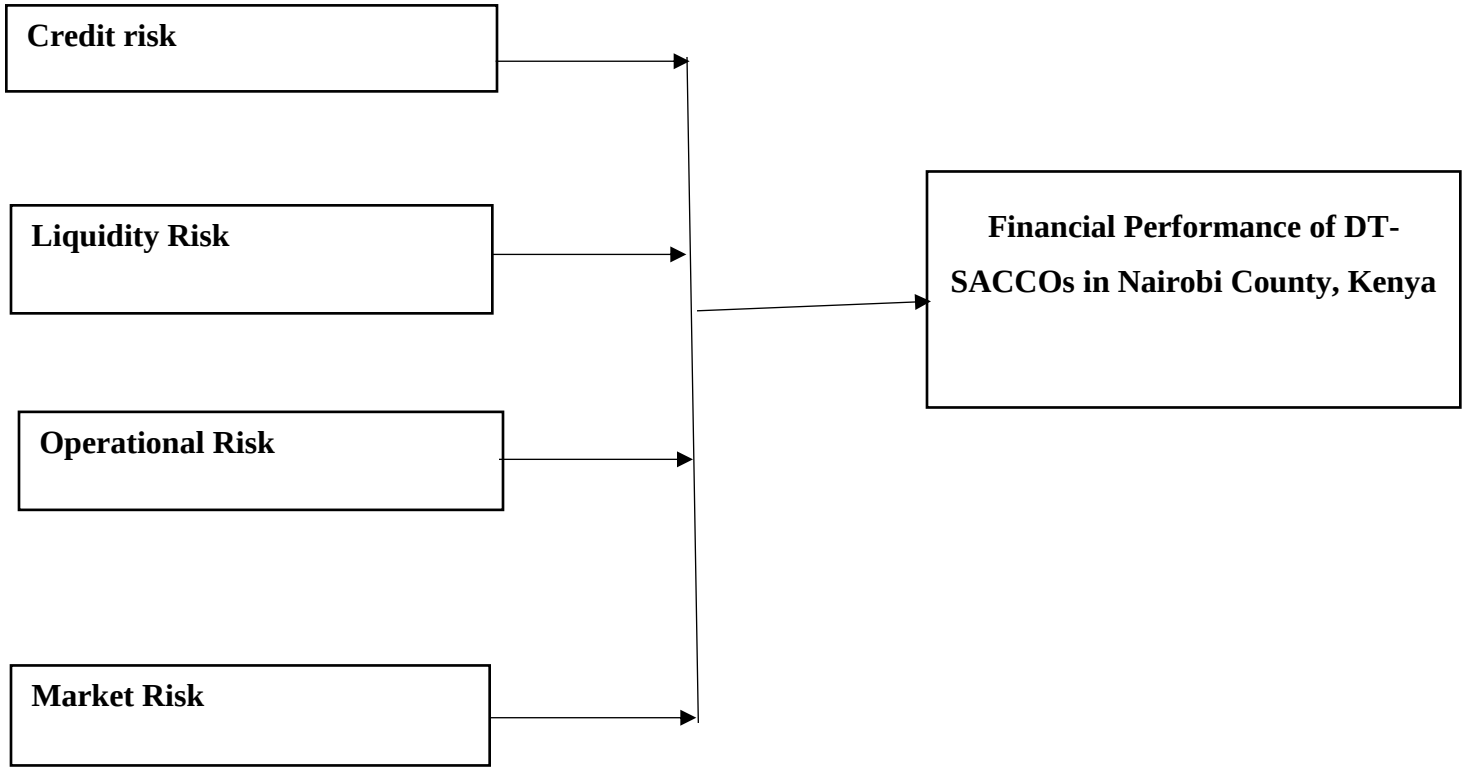


Figure 2.1: Conceptual Framework

2.5.1 Credit Risk

This is the probability that a borrower is unable or unwilling to pay interest and/ or repay the principal of a loan in line with the terms stipulated in the loan agreement, leading to financial loss for the lender (SASRA Risk Management Practices for DT Saccos, 2015). This arises when there is an asymmetric information problem in an organization. In this study credit risk was shown by loan delinquency that was measured by taking total loans divided by the number of total loans for each of the DT-SACCOs for a period covering the years 2014 to 2018.

2.5.2 Liquidity Risk

This is the ability to meet the demand for new loans and cater to unexpected savings withdrawals at the lowest cost. Liquidity risk is the risk to the earnings of a Sacco due to lack of capacity to meet its debts as they fall due (SASSRA Guidelines on Risk Management, 2015). It leads to a loss when a Sacco is unable to invest funds to increase its assets base without incurring losses during its operations (Crouhy, Galai &Mark 2010).

For this study, liquidity risk was indicated by the number of liquidity reserves held by each of the DT-SACCOs under the study. And this was calculated by taking total liquid Reserves divided by Total Savings deposits.

2.5.3 Operational Risk

This is the risk of loss due to weak or collapsed internal processes, persons (fraud and incompetence), and IT systems (system failure), or from external occurrences (Crouhy, Galai &Mark 2010). In this study, operational risk was measured using the operating expense ratio as the proxy, which was obtained by taking total operating expenses divided by total assets of each of the DT-SACCOs under study.

2.5.4 Market Risk

Is the risk of loss of a Sacco's earning and/or capital emanating from sensitivity to changes in interest rate, foreign exchange rate (current or potential risks to earnings and capital emanating from excess movements in currency exchange rates), or in prices (loss due to unfavorable movements in market prices). It can also be defined as the possibility for loss due to variations in market risk variables for instance commodity prices, foreign exchange rates, equity, and interest rates (SASSRA Guidelines on Risk Management, 2015). The market risk was measured using the amount of financial leverage for each of the DT-SACCOs under the study.

2.6 Operationalization of Variables

Table 3.1: Operationalization of Study Variables

Category	Variable	Indicator	Measurement
Independent Variable	Credit risk	Loan Delinquency	$\frac{\text{Total Delinquent Loans}}{\text{Total Loans}}$
	Liquidity Risk	Liquidity Reserves	$\frac{\text{Total Liquid Reserves}}{\text{Total Saving Deposits}}$
	Operational risk	Operating Expense Ratio	$\frac{\text{Operating Expenses}}{\text{Total Assets}} \times 100$
	Market risk	Financial Leverage	$\frac{\text{Earnings before interest and Tax}}{\text{(Earnings before Tax-interest)}}$
Dependent Variable	Financial Performance	ROA	$\frac{\text{Profit before Tax}}{\text{Total Assets}}$

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the tools employed for the research. It highlights the survey methods that were used to execute the study in an attempt to answer the research questions. Furthermore, different methodological issues are discussed including population, sampling techniques, sampling frame, sample size, data collection procedure, and analysis techniques that were adopted in conducting the study. It also gives data validity and reliability statement.

3.2 Research Design

This research adopted a descriptive research design as it explained the association between the variables. According to Cooper and Schindler (2008), a research design is a blueprint for the collection, measurement, and data analysis. Kothari (2009) defines it as the organization of methods that ensures that the objective of the research is realized. The descriptive research design also helps describes elements as they are in their natural phenomenon. The descriptive design was adopted since it enabled the investigator to collect huge quantities of data regarding the population under scrutiny.

3.3 Target Population

Donald Cooper (2010) defines a population element as the unit of analysis for every study. The target population of this research was the deposit taking SACCOs in Nairobi County, Kenya regulated by SASRA. As of 27th January 2019, there was 176 deposit taking Sacco businesses in Kenya, while 46 Saccos in Nairobi. Deposit taking Saccos were selected because they contribute more than 70% of assets, deposit from members, loans, and 78% turnover of the total Sacco sector in Kenya, (Alukwe, 2005).

3.4 Sample Size

According to Cooper and Schinder (2008), sample size is the number of items selected to present the target population. The sample size selected should be based on the type of data to be collected, the confidence level and accuracy being sought by the researcher (Mugenda &

Mugenda, 2003). According to SASRA (2018), there were 46 DT-SACCOs in Nairobi County but this study concentrated on the 32 DT-SACCOs Nairobi County, Kenya which are licensed to conduct business between the periods 2014 to 2018 and thus a census study was done.

3.5 Data Collection Instrument

The research utilized secondary data that was collected from SASRA annual reports for a period of five years, 2014 to 2018, in which all the 36 DT Saccos in Nairobi were in operation.

3.6 Data Analysis and Presentation

The study adopted the panel data estimation method due to the nature of data collected which was more than two years, a pre-requisite for panel data, and also numerous observations. Descriptive statistics that the study adopted are; computation of mean, standard deviation, variance, skewness, kurtosis, and maximum and minimum value for the variables.

Data analysis was done using STATA version 12 as it aided in describing the relationships between variables through the use of the coefficient of determination, which described the extent of the relationships among the variables. Also, the hypothesis was tested to determine the direction and magnitude of the relationships. Tables and charts were also used to present the statistics. An analytical model-regression analysis was done to establish the nexus among variables. The model is depicted below;

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it} \quad \text{(i)}$$

Where:

Y_{it} is the financial performance of deposit taking Saccos in Nairobi County, Kenya at time t.

β_0 is the constant term. Is the value of Y_{it} when all the variables are held constant.

β_1, β_2, β_3, and β_4 are regression coefficients that measure the influence of liquidity risk, credit risk, operational risk, and market risk respectively on the financial performance of DT- Saccos in Nairobi County, Kenya.

X_{1it}, X_{2it}, X_{3it}, X_{4it} denotes independent variables credit risk, liquidity risk operational risk, and market risk respectively.

ε= Error term consolidates other variables that affect financial performance but not highlighted in the model

3.7 Diagnostic Tests

These were done before the data analysis process to find out if problems due to violation of assumptions of the regression model. These included; the autocorrelation test, multicollinearity test, homoscedasticity test, unit root test, and normality test.

3.7.1 Multicollinearity Test

According to Hair (2010), multicollinearity occurs when multiple variables are strongly correlated which could influence the parameters' estimation. According to Brooks (2018), if the independent variable becomes a duplication of the other independent variables, then the model cannot be estimated since it is in perfect collinearity position. This study used VIF to test for multicollinearity for each independent variable. Decision rule: VIF < 4.0 indicates multicollinearity, not a major problem, VIF >4.0, indicates the presence of multicollinearity, and VIF > 10, indicates severe multi-collinearity which requires further investigation.

3.7.2 Autocorrelation Test

Autocorrelation occurs when the residuals are not independent of each other. Regression analysis requires little or no correlation in the data. Autocorrelation in the regression model was done

through the Woolridge test to test whether the residuals are independent of each other. According to Srivastava, Shenoy, and Sharma (2015), point out that the autocorrelation test assists in showing the distribution of disturbance (errors).

The Durbin-Watson statistics values range from 0 to 4, where an ideal value of 2 indicates non-autocorrelation, a value closer to 0 shows a positive autocorrelation and a value closer to 4 indicates a negative autocorrelation (Srivastava et al., 2005). Decision rule: when the p-value is greater than 0.05, accept the null hypothesis and conclude that the residuals have no serial correlation and vice versa.

3.7.3 Homoscedasticity Test

Homoscedasticity shows that the variance of errors is consistent across all levels of independent variables. Homoscedasticity of residuals was checked by using the Breusch-Pagan/Cook Weisberg test to check if the variance of errors from the regression is dependent on the independent variable values. The null hypothesis will be that the variance is constant. If the P-value is less than 0.05, then the hypothesis will be rejected showing a problem of heteroscedasticity, and if the p-value is 0.05 and above then the null hypothesis will be accepted and conclude that there is no heteroscedasticity.

3.7.4 Normality Test

A normality test was executed to ascertain the variables' normality. The univariate normality of variable is said to exist if kurtosis statistic falling between (-10.0, 10.0) and skewness statistic is within (-3.0, 3.0) (Kline, 2011). The study carried out the normality test by carrying out the

Shapiro-Wilk test. In this test, if the significance value is less than 0.5, then the data is not normally distributed.

3.7.5 Test for Random and Fixed Effects

The study carried out the Hausman specification test to determine if the variables have fixed influence overtime or if the variables have varying and random influences over time. The null hypothesis assumed that variables have a random effect and the alternative hypothesis was that the variables have a fixed effect. If the p-value is less than 0.05 then the null hypothesis will be rejected and if greater than 0.05 then the null hypothesis will be accepted.

CHAPTER FOUR
DATA ANALYSIS, RESULTS, AND FINDINGS

4.1 Introduction

This chapter entails the data analysis, interpretation, and discussions of the outcomes. The section hence is fragmented into five subsections, which entail descriptive statistics, inferential statistics, and interpretation and the arguments regarding the outcomes. Precisely this chapter summarizes the platform for data presentations, analysis, and interpretations.

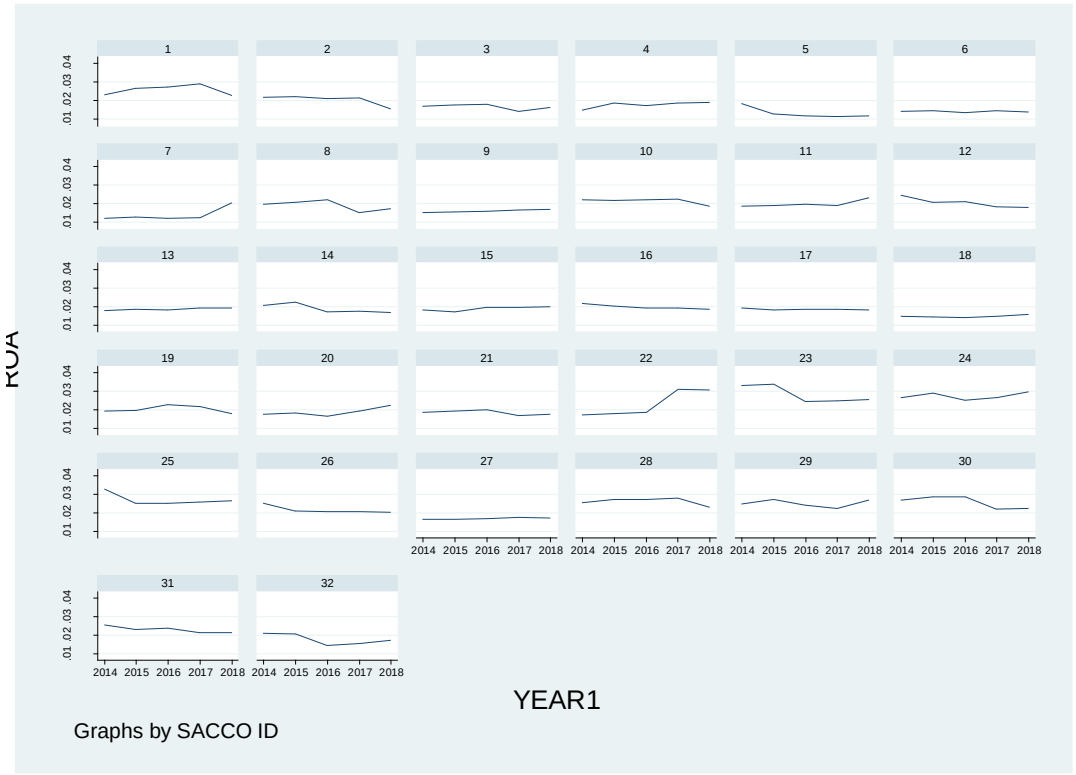
4.2 Descriptive Statistics

A descriptive study tries to explain or describe a subject frequently by establishing an outline of a collection of problems, individuals, or events, by collecting data and the tabulation of the frequencies of research variables or their relationship. It provides a range of research objectives such as an explanation of an event or characteristics linked with a subject population, approximation of the extent of the population that possesses these features, and the unearthing of linkages among varying variables (Ngechu, 2004). In this study, the descriptive research design was selected since it will enable the generalization of the findings of the population; it will allow analysis and relation of variables.

4.2.1 Exploratory Data Analysis

As shown in figure 4.1 return on assets was not constant it kept on raising and failing. Financial performance of Deposit taking SACCOs depicted upward inclination and downward drift as shown in figure 4.1. The upwards trend was caused by the conducive business environment and small downward trends were caused by the unwillingness payment of the loan by borrowers.

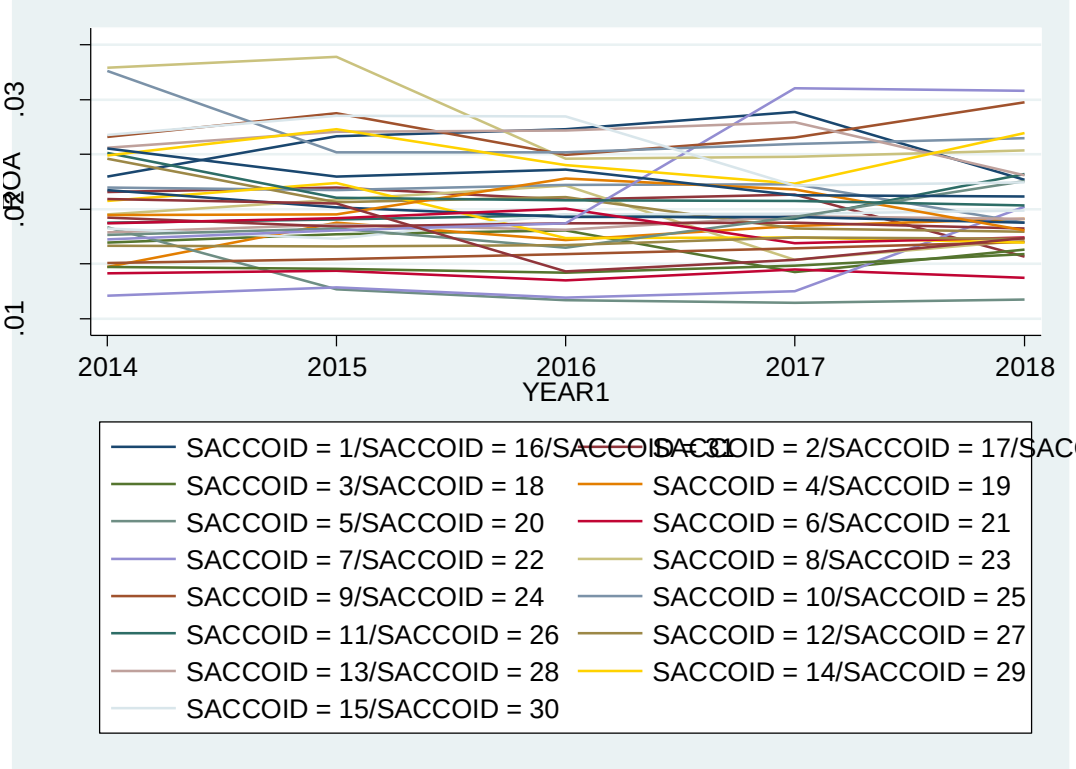
Figure 4.1 Financial risk ration on deposit taking SACCOs in Nairobi County, Kenya from 2014 to 2018



Source: Author 2020

As presented on figure 4.2 some of DTS shows an increase in level of ROA from 2016 to 2018 but in some DTS this rate started to decline gradually. The high rate of financial performance reported by Deposit taking SACCOS emanated from active services offered by Credit Reference Bureau (CRB) by operationalizing section 31 of banking Act and section 34 of Microfinance Act which decrees all banks and microfinance to submit both negative and positive information concerning credit services they offer to their clients to ensure that they list all serial defaulters and thwart them from getting another avenue of borrowing so as to defraud lenders by not complying with debt obligation of payment.

Fig.4.2 Financial performance amongst DTS for the year 2014-2018



Source: Author 2020

4.3 Descriptive Analysis

Table 4.1: Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
ROA	overall	.0202338	.0046578	.0114199	.0338833	N = 160
	between		.0041263	.0131693	.0283023	n = 32
	within		.0022576	.0143174	.0281144	T = 5
Market~k	overall	.0176354	.0042836	.0040402	.0253075	N = 160
	between		.0038438	.0044588	.023416	n = 32
	within		.0019864	.00687	.0288118	T = 5
Credit~k	overall	.0163414	.004258	.0098543	.0291416	N = 160
	between		.0036504	.0105561	.0239269	n = 32
	within		.0022673	.010206	.0253539	T = 5
Liduid~k	overall	.0187131	.003853	.0039737	.0306338	N = 160
	between		.0032048	.0100498	.0243555	n = 32
	within		.0021985	.0113958	.0271216	T = 5
Oprati~k	overall	.0073601	.0047494	.0028239	.0221759	N = 160
	between		.0045633	.0035498	.0175872	n = 32
	within		.0015024	.0004024	.0146263	T = 5

Source: Author 2020

Table 4.1 shows descriptive statistics and distribution of variables which entails mean, standard deviation, maximum, and maximum. An aggregate of 160 occurrences of individual variables was reported. Mean is a measure of a dominant tendency which used to describe the utmost typical values formed in a certain data set. In what way the distribution is from the mean is measured by the standard deviation. Skewness is used as a measure of symmetry, a set of data is considered to be asymmetric if appears similar from the center point either from the right or left while Kurtosis is used to indicate the data used are either peaked or can be considered as a flat comparative standard distribution.

Table 4.1 shows that the average ratio of return on assets (ROA) of Deposit taking Sacco's covered in this study was 2.03% and a standard deviation of 0.0046, this positive results shows that the deposit taking SACCOs in Nairobi County, Kenya were making a good return with a minimum and a maximum of operational risk of 0.114 and 0.339 respectively.

Market risk ratio reported a mean of 1.76% and a standard deviation of 0.0042 indicating that most of the deposit taking SACCOs in Nairobi County, Kenya were exposed to high market risk as depicted by positive outcomes with minimum and maximum of 0.0040 and 0.0253 respectively.

The credit risk ratio reported a mean of 1.63% and a standard deviation of 0. 0043 this shows that most of the deposit taking SACCOs in Nairobi County, Kenya have positive credit risk hence they were not in a position to issue more loans since there is a financial crisis with a minimum and a maximum of 0.0096 and0.0291 respectively.

Liquidity risk reported a mean of 1.87% with a standard deviation of 0.0038 indicating that most of the deposit taking SACCOs in Nairobi County, Kenya had a positive liquidity risk with a minimum and a maximum of 0.00397 and 0.0306 respectively.

Operational risk reported a mean ratio of 0.736 % and a standard deviation of 0.0047 and this indicates that most of the deposit taking SACCOs in Nairobi County, Kenya had a positive operational risk position, with a minimum and a maximum of 0.0028 and 0.2217 respectively.

The positive values obtained infers that all the variables used in the study are substantial in determining the financial performance in Deposit taking SACCOs in Nairobi County, Kenya.

4.4 Inferential Statistics

Inferential statistics were used in determining the direction, relationship, and strength of the association between the predictor variables and the response variable. The section entails the inferential statistics employed in the study, which included correlation and panel multiple linear regression analysis. Also, diagnostic tests that are a precursor to conducting linear regression were conducted. The diagnostic tests included the autocorrelation test, multicollinearity test, homoscedasticity test, unit root test, and normality test. The Hausman test was also carried out to

determine if the variables have fixed influence overtime or if the variables have varying and random influence over time.

4.4.1 Correlation Analysis

Correlation analysis establishes whether there exists an association between two variables. The association falls between a perfect positive and a strong negative correlation. The study used the Pearson Correlation to examine the presence of a relationship between the variables used in the study. The study envisioned to establish the relationship between each independent variable and financial performance of deposit taking SACCOs. The Pearson correlation coefficient was employed to examine the presence of a relationship between the variables used in the study. The aptness of the variables used in a study can be determined by the correlation analysis (Gosh, 2015). From the results in table 4.2, the market risk ratio is measured by earnings before interest and tax divided by earnings before interest and tax less interest. Market risk has a positive significant correlation with financial performance as revealed by a correlation coefficient of 0.248. The credit risk ratio is determined by dividing Total Delinquent Loans by total loan which illustrates a strong positive and significant correlation with financial performance as shown by a correlation coefficient of 0.822. The liquidity risk ratio shows a weak negative correlation with financial performance with a correlation of -0.180 which was statistically significant while operational risk indicates a strong and significant negative association with financial performance as revealed by coefficient -0.423. There was also association among the independent variables, which are credit risk and market risk with a correlation coefficient of 0.183, between liquidity risk and market risk a correlation coefficient of 0.107, between operational risk and market risk a correlation coefficient of -0.339.

Table 4.2: Correlation Analysis

	ROA	Market risk	Credit Risk	Liquidity risk	Operation risk
ROA	1				
Market risk	0.248**	1			
Credit Risk	0.822***	0.183*	1		
Liquidity risk	-0.180*	0.107	-0.244**	1	
Operation risk	-0.423***	-0.339***	-0.118	0.150	1

* p<0.05, ** p<0.01, *** p<0.001

Source: Author 2020

4.4.2 Diagnostic Tests

Diagnostic tests done in this study included normality tests, homoscedasticity tests, multicollinearity tests, and autocorrelation tests. The normality test was carried out using the Shapiro-Wilk test and the homoscedasticity test was conducted through the Breusch-Pagan test. Test on multicollinearity of data was carried out using Variance Inflation Factors (VIF) while the autocorrelation test was done through the Durbin-Watson statistic. The Hausman test was conducted to determine whether fixed or variable effects panel regression should be conducted.

4.4.2.1 Normality Test

The normality tests for all the variables employed in the study are highlighted in Table 4.13. Shapiro wilts test was used to examine the normality of the variables. From the outcomes displayed on the table, all the variables used in the use in the study were normal. The pertinent outcomes are presented in Tables 4.3 below

Table 4.3: Shapiro-Wilk Test for Normality

```
. swilk ROA Marketrisk CreditRisk Liduidityrisk Oprationalrisk

                    Shapiro-Wilk W test for normal data

    Variable |     Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
         ROA |     160    0.97278       3.348     2.748    0.00299
  Marketrisk |     160    0.87138      15.818     6.281    0.00000
  CreditRisk |     160    0.93055       8.542     4.879    0.00000
Liduidityr~k |     160    0.90465      11.726     5.600    0.00000
Oprational~k |     160    0.73997      31.980     7.882    0.00000
```

Source: Author 2020

4.4.2.2 Test for Multicollinearity

Multicollinearity is said to exist when two or more variables which are predictors are correlated. According to Gujarati (2012), a multicollinearity problem affects the coefficients of the regression model such that estimation cannot be carried out with accuracy and meticulousness due to standard errors. Variance inflation factor was adopted by the study to test the multicollinearity. According to Gujarati & Greene (2012), a VIF value of 1 shows not multicollinearity problem, values between 1 and 5, is an indicator of reasonable multicollinearity problem in predictor variables while a value greater than 5 shows highly correlated variables in the study. From the table below, the variance inflation factor is 1.09, which is a modest level of Multicollinearity problem hence the Multicollinearity was not a great problem in the predictor variables used.

Table 4.5: VIF Multicollinearity Statistics

```
. vif
```

Variable	VIF	1/VIF
Liduidityr~k	1.15	0.870467
Oprational~k	1.14	0.873373
CreditRisk	1.04	0.960105
Marketrisk	1.03	0.968276
Mean VIF	1.09	

Source: Author 2020

4.4.2.3 Unit-Root Test for Panel Stationarity

Harris and Tzavalis (1999) test was adopted by the study to determine the stationarity of the variables used. The null hypothesis for this test is, there is no stationarity if the P-value is greater than 0.05 but if otherwise the null hypothesis is rejected. From results presented in tables 4.5 to 4.10 all the variables used in the study were stationary hence null hypothesis was rejected and concluded that stationarity was presented and no need of de-trending any variable used.

Table 4.6: Stationarity for ROA

```
. xtunitroot ht   roa1

Harris-Tzavalis unit-root test for roa1
------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     32
Ha: Panels are stationary                   Number of periods =      4

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic         z         p-value
------------------------------------------------------------------------------
 rho                  -0.4068       -7.8923       0.0000
------------------------------------------------------------------------------
```

Source: Author 2020

Table 4.7: Stationarity for market risk

```
. xtunitroot ht  marketrisk1

Harris-Tzavalis unit-root test for marketrisk1
------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     32
Ha: Panels are stationary                   Number of periods =      4

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic         z         p-value
------------------------------------------------------------------------------
 rho                  -0.2737       -6.5903       0.0000
------------------------------------------------------------------------------
```

Source: Author 2020

Table 4.8: Stationarity for Credit Risk

```
. xtunitroot ht    creditrisk1

Harris-Tzavalis unit-root test for creditrisk1
------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     32
Ha: Panels are stationary                   Number of periods =      4

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic         z         p-value
------------------------------------------------------------------------------
 rho                  -0.4585       -8.3977       0.0000
------------------------------------------------------------------------------
```

Source: Author 2020

Table 4.9: Stationarity for Liquidity Risk

```
. xtunitroot ht     liquidity1

Harris-Tzavalis unit-root test for liquidity1
------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     32
Ha: Panels are stationary                   Number of periods =      4

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic         z         p-value
------------------------------------------------------------------------------
 rho                  -0.4577       -8.3906       0.0000
------------------------------------------------------------------------------
```

Source: Author 2020

Table 4.10: Stationarity for operational Risk

```
. xtunitroot ht      operationalrisk1

Harris-Tzavalis unit-root test for operationalrisk1
------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     32
Ha: Panels are stationary                   Number of periods =      4

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic         z         p-value
------------------------------------------------------------------------------
 rho                  -0.3064       -6.9104       0.0000
------------------------------------------------------------------------------
```

Source: Author 2020

4.4.2.4 Serial correlation

Gujarati (2012) opines that serial correlation is a relationship among the member of a certain series of given certain observations well-ordered in space or in time. The study embraced and employed

the Wooldridge drunker test to check serial correlation from panel data used, from the results presented in tables 4.11 to 4.14, a serial correlation was present. Conversely, serial correlation does not occur in any panel data where the duration of the study is less than 20 years. Wooldridge (2012) opines. The study used panel data for a duration of 5 years henceforth is presumed that serial correlation has an insignificant influence on the data analyzed.

Table 4.11: Serial correlation for ROA

```
. xtserial  ROA

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,      31) =     53.049
           Prob > F =      0.0000
```

From table 4.11 the P-value for ROA is 0.0000 which is less than 0.05, we reject the null hypothesis and conclude that ROA is stationery which is desirable.

Table 4.12: Serial correlation for market risk

```
. xtserial   Marketrisk

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,      31) =      6.712
           Prob > F =      0.0145
```

From table 4.12 the P-value for market risk is 0.0145 which is less than 0.05, we reject the null hypothesis and conclude that market risk is stationery which is desirable.

Table 4.13: Serial correlation for credit risk

```
. xtserial    CreditRisk

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,      31) =     88.452
           Prob > F =      0.0000
```

From table 4.13 the P-value for credit risk is 0.0000 which is less than 0.05, we reject the null hypothesis and conclude that credit risk is stationery which is desirable.

Table 4.14: Serial correlation for liquidity risk

```
. xtserial     Liduidityrisk

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,      31) =     18.465
           Prob > F =      0.0002
```

From table 4.14 the P-value for liquidity risk is 0.0002 which is less than 0.05, we reject the null hypothesis and conclude that liquidity risk is stationery which is desirable.

4.4.5 Pooled OLS Model or Random Effect model

Breusch-Pagan Lagrange multiplier (LM) test is used to determine which model to accept between random effect and Pooled OLS (Bell & Kelvyn, 2015). The null hypothesis for the LM test is that significant differences across the used units do not exist hereafter the inconsistencies are zero and the random effect model is not appropriate, the alternative hypothesis for the test is that the random effect model is suitable. The decision is based on the P-value whereby if the P-value is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis and conclude that random effect is appropriate for the study.

As per the results in table 4.15, the p-value is 0.0000 which is less than 0.05, we reject the null hypothesis and conclude that the random effect model is appropriate for the study.

Table 4.15 Results for Breusch-Pagan LM test

```
Breusch and Pagan Lagrangian multiplier test for random effects

        ROA[SACCOID,t] = Xb + u[SACCOID] + e[SACCOID,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+------------------------------
                     ROA |    .0000217       .0046578
                       e |    2.15e-06       .0014652
                       u |    2.76e-06       .0016624

        Test:   Var(u) = 0
                                chibar2(01) =    82.21
                             Prob > chibar2 =   0.0000
```

4.4.6 Hausman test

Hausman test is carried out to determine whether there is a correlation between unique errors and regressors (Greene, 2012). The null hypothesis for this test is, a random model is appropriate, and the alternative hypothesis state that the fixed effect model is suitable (Warue, 2013). From results obtained in table 4.16, the p-value is 0.1341 which is insignificant since is greater than 0.05 henceforward the null hypothesis is accepted, the random effect model was suitable for this study.

Table 4.16: Hausman Test of Specification

```
. hausman fixed random
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Marketrisk	.0142209	.0074831	.0067379	.034692
CreditRisk	.8667036	.8435302	.0231734	.0316806
Liduidityr~k	-.0844002	-.0547566	-.0296436	.0234859
Oprational~k	-.4962966	-.3963156	-.099981	.064325

```
                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

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        7.03
                Prob>chi2 =      0.1341
```

4.5 Random Effect Model

The random effect model was fitted to determine the relationship between market risk, credit risk, liquidity risk, and operational risk on the financial performance of Deposit Taking SACCOs in Kenya, Nairobi County. The findings are displayed in Table 4.17.

```
. estimates store fixed

. xtreg ROA Marketrisk CreditRisk Liduidityrisk Oprationalrisk, re

Random-effects GLS regression                   Number of obs      =       160
Group variable: SACCOID                         Number of groups   =        32

R-sq:  within  = 0.6672                         Obs per group: min =         5
       between = 0.8099                                        avg =       5.0
       overall = 0.7758                                        max =         5

                                                Wald chi2(4)       =    379.21
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Marketrisk	.0074831	.0486279	0.15	0.878	-.0878259	.102792
CreditRisk	.8435302	.0451744	18.67	0.000	.7549899	.9320704
Liduidityr~k	-.0547566	.0478078	-1.15	0.252	-.1484582	.038945
Oprational~k	-.3963156	.0537351	-7.38	0.000	-.5016344	-.2909968
_cons	.010259	.0015373	6.67	0.000	.0072458	.0132721
sigma_u	.00166236					
sigma_e	.00146519					
rho	.56279399	(fraction of variance due to u_i)				

```
.
```

The overall R^2 indicates deviations in the response variable as a consequence of differences in predictor variables. The overall R^2 value is 0.7758, a discovery that 77.58% of the deviations in the financial performance of deposit taking SACCOs in Nairobi County, Kenya is caused by financial risk. Other factors not incorporated in the model justify for 22.42% of the variations in the financial performance of deposit taking SACCOs in Nairobi County, Kenya.

The null hypothesis is that financial risk does not significantly influence financial performance. The significance value obtained in the study (Prob>F=0.0000) is less than the critical value of 0.05. Consequently, the null hypothesis is rejected. Thus, financial risk significantly affects financial performance. Additionally, financial risk can also significantly predict financial performance.

The null hypothesis was that there was no significant relationship between the various financial risk components and financial performance.

4.5.1 The Model Equation

The assumed equation of the model is replicated below:

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

β1X1it= Market Risk

β2X2it= Credit Risk

β3X3it= Liquidity Risk

β4X4it= Operational Risk

β0 = constant Intercept

β1, β2, β3, = coefficient of regression model for the independent variable

Fitted equation from random regression model

$Yit = 0\ .010259 + 0.0074831X1_{it} + .8435302X2_{it} - 0.0547566X3_{it} - 0.3963156X4_{it}$

4.5.1 Market Risk and financial performance

The market risk was determined by dividing earnings before interest and tax with earnings before interest and tax less interest (Gatsi et al., 2013 & Muriithi, 2016). The P-value of market risk was 0.878 which is greater than 0.05, hence there was an insignificant correlation between market risk and financial performance of deposit taking Saccos in Nairobi County, Kenya. The coefficient of Market risk, was 0.074831, implying that a unit change in market risk leads to a 0.074831 increase in the financial performance of deposit taking SACCOs in Nairobi County, Kenya. The study showed that there was no significant association between market risks and financial performance this in line with the study conducted by Kassi, Rathnayake, Louembe, and Ding (2019), which was carried out to examine the effect of market risk on the financial performance of 31 non-financial firms quoted in Casablanca Stock Exchange in Morrocco.

4.5.2 Credit risk and financial performance.

The credit risk of a firm displays the extent of loan default a Deposit taking SACCOs is exposed to at different times of the year. Credit risk was determined by dividing total delinquent loans with total loans a DTS were exposed to during the period of the study. As per the results displayed by the random effect model, there was a positive significant correlation between credit risk and financial performance of deposit taking SACCOs in Nairobi County, Kenya, since the p-value is 0.000 which is less than 0.05. This indicates that there is a strong positive correlation between credit risk and financial performance of deposit taking SACCOs in Nairobi County, Kenya. When other factors are held constant, the coefficient of credit risk is 0.451744, connotes that a unit change in credit risk leads to a 0.451744 change in the financial performance of deposit taking SACCOs in Nairobi County Kenya. This result supports finding made by Li and Zou (2014); Luqman (2014) and Mogga (2018) that credit risk influence financial performance of a financial institution.

4.5.2 Liquidity Risk and financial performance

Galai &Mark 2010 opines that liquidity risk is the risk to the earnings of a Sacco due to lack of capability to meet its debts when they fall due. It leads to a loss when a deposit taking SACCOs is unable to invest funds to increase its assets base without incurring losses during its operations. Sacco's liquidity risk was determined by dividing total liquid reserves with total saving deposits. The P-value of the deposit taking SACCOs in Nairobi County was 0.252 which is greater than 0.05 hence insignificant for the study indicating that there was no correlation between liquidity risk and financial performance reported by deposit taking SACCOs in Nairobi County, Kenya. The

coefficient of liquidity risk is -0.0547566 indicating that a unit change in liquidity risk leads to a decrease in the financial performance of deposit taking SACCOs in Nairobi County, Kenya. This study supports what was reported by Waweru and Muriithi (2017) that the liquidity risk of a firm does not have a significant effect on the financial performance of deposit taking SACCOs.

4.5.3 Operational Risk and financial performance

According to Galai &Mark (2010), operational risk is the risk of loss due to weak or collapsed internal processes, persons, and IT systems or from external occurrences. The operational risk ratio was measured by taking total operating expenses divided by total assets of the deposit taking SACCOs. If this ratio is high, it indicates a high rate of operating risk SACCOs are exposed to. From the results of the random effect model, there was a negative significant correlation between operational risk and financial performance of deposit taking SACCOs, since the p-value is 0.000 which is less than 0.05. This indicates that there is a relationship between firm operating risk and financial performance reported by deposit taking Saccos. When other factors are held constant, the coefficient of operational risk is -0.3963156, signifies that the average effects of operational risk on financial performance when operational risk changes across the time and between firms by one unit. This result supports the finding made by Meshack and Mwaura (2016) that operational risk negatively influences the financial performance of a firm but contradicted what was reported by Aganoke, Okeke, and Onuora (2018). Musiega, Clive, and Siminyu (2017) carried out an investigation to ascertain the impact of operational risk on the financial performances of Saccos in Kakamega County. The study established that there exists a strong positive linear association between financial systems and the financial performance of deposit taking SACCOs in Kakamega.

CHAPTER FIVE

SUMMARY, DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This section presents the summary of the study's findings, offered conclusions, and recommendations on the effect of financial risk on the financial performance of licensed deposit taking SACCOs in Nairobi County. Additionally, further research suggestions are also outlined. The main objective of the study was to examine the effect of credit risk, liquidity risk, operational risk, and market risk on the financial performance of deposit taking SACCOs in Kenya. The period of the study was 5 years, from 2014 to 2019.

5.2 Summary of findings

This study purposed to establish the effect of financial risk on the financial performance of licensed deposit taking SACCOs in Nairobi County. The study specifically aimed at examining the magnitude to which credit risk, liquidity risk, operational risk, and market risk impact the financial performance of licensed deposit taking SACCOs in Nairobi County. Thus, the data analysis, presentation, interpretation, and discussion of findings of the study were based on the aforementioned specific objectives. The study employed the use of descriptive, correlation, and regression analysis.

5.2.1 Market risk and financial performance

The study sought to examine the effect of market risk on the financial performance of Deposit SACCOs in Kenya, Nairobi County. The findings obtained show that the null hypothesis which states that there is a correlation between market risk and financial performance was rejected. This finding can be recognized in instances where a financial institution experience changes in

interest rate, foreign exchange rate (current or potential risks to earnings and capital emanating from excess movements in currency exchange rates), or in prices (loss due to unfavorable movements in market prices) tend to adjust their operations and transfer those expenses or risks to final consumers by charging high rates on borrower and offer low rates on deposits to mitigate financial crisis which may adversely affect the liquidity position of deposit taking SACCOs in a certain period of the year. There was no correlation between the market risk and financial performance during the period of the study since DTS was constant and able to control the market risk hence existence of this risk didn't have any effect on financial performance reported by the deposit taking SACCOs. These results are in agreement with other studies.

The correlation analysis findings showcased that market risk does not have a significant association with financial performance. The coefficient obtained indicates that when market risk increases by one-unit, it results in an increase in the financial performance of deposit taking SACCOs in Nairobi County, Kenya.

5.2.2 Credit risk and financial performance.

The study aimed to examine the effects of DT-SACCOs' credit risk on financial performance. The results obtained from the study direct to accept the null hypothesis that credit risk affects financial performance reported by deposit taking SACCOs in Nairobi County, Kenya. The high level of credit risk ratio greatly negatively affected the level of financial performance as reported by deposit taking SACCOs. This could be attributed to the fact that if a financial institution invests in high risky ventures or lend money to an individual considered as high-risk borrowers chances of making huge losses are inevitable since borrowers may end not paying at all or delay unreasonably to honor their obligations of repaying their loans. In most cases, a high rate of delinquent loans may have a negative implication on the liquidity position of deposit taking

SACCOs to care and a thorough review of borrowers should be done to prevent those loans from becoming bad debt which may cripple the liquidity position of the lender at a given time. These results are in agreement with other studies arguing that credit risk influences financial performance reported by Deposit-taking SACCOs in Kenya.

5.2.3 Liquidity Risk and financial performance.

The study sought to examine the relationship between liquidity risk and financial performance of deposit taking SACCOs in Kenya, Nairobi County. From the results obtained, the ratio of liquidity risk was determined by dividing total liquid reserves with total saving deposits which were not significant for this study since the p-value obtained was insignificant to show any correlation. This means that most deposit taking SACCOs were able to maintain the minimum prescribed level of liquidity as expected hence there was no correlation between liquidity risk ratio and financial performance. The ratio of liquidity risk from the examined deposit taking SACCOs was found to be irrelevant and not correlated to the reported high level of financial performance this can be attributed to the reason that for deposit taking SACCOs to lend will depend on the liquidity position in existence provided members' deposits are available when the need for a loan arises and prescribed level of liquidity is maintained at all time. This indicated DT-SACCOS were having the ability to meet the demand for new loans and cater to unexpected savings withdrawals at the lowest cost and also had the capacity to meet its debts as they fall due hence no influence on financial performance. These results are in agreement with other studies arguing that liquidity risk does not influence financial performance reported by Deposit taking SACCOs.

5.2.4 Operational Risk and financial performance

The objective of the study was to determine the effects of operational risk on the financial performance of deposit taking SACCOs. The results found obliged the study to accept the null

hypothesis that operational risk affect the level of financial performance reported by deposit taking SACCOs. The high level of operational risk ratio attracted a high level of financial performance as reported by deposit taking SACCOs. This could be attributed to the fact that if a financial institution has a high level of expenses that are directly related to the operation and investment of the DT-SACCOs high rates of returns are attained. If a DT-SACCOS hires competent and qualified personnel and embraces the latest technology in its operations it may be expensive but high rates of returns are guaranteed in most cases.

5.3 Discussion of Findings

5.3.1 Financial Risk and Financial Performance

The study established that financial risk has a statistically significant effect on financial performance. This is in line with the assertions by Dimitropoulos et al, (2010) and Tafri et al., (2009) that financial risk is the unanticipated volatility of financial performance. It is also in tandem with the statement by Holton (2004) that financial risk includes credit, market, and liquidity risks, which cumulatively result in the volatility of returns. Finally, the finding is congruent to Demirguc-Kunt and Huzinga's (2000) statement that financial risk results in poor financial performance if poorly managed.

The study findings are congruent to study findings by Dhanini et al. (2007) which stated that when a business enterprise is exposed to financial markets, the odds are suffering a loss but there are also avenues for attaining profit because exposure to the financial market may provide strategic benefits. The study further asserted that the benefits of proper management of financial risk are as important as those of implementation of a risk management policy since financial risks are a component of the firm's risks. The study concluded that one of the fundamental prejudice is to reduce the changes in earnings as a result of financial risks.

The study findings are similar to findings of a study conducted by Mogga (2018) which established that majority of the banks considered identification of risks as a process in the credit risk management which influenced financial performance and that risk identification has a negligible effect on the bank's financial performance while risk analysis influenced commercial bank's financial performance to a small extent, risk monitoring influenced financial performance to a large extent while credit approval was a strong factor impacting commercial banks' performance.

5.3.2 Credit Risk and Financial Performance

The study established that credit risk has neither a significant association nor a significant impact on financial performance. The current study findings go against a study by Mogga (2018) on the effect of credit risk management on the financial performance of commercial banks in Juba, South Sudan. The study established that credit approval was a strong factor impacting commercial banks' performance.

Luqman (2014) undertook an investigation on the effect of credit risk on Nigerian commercial banks' performance. The survey showed that the loan ratio plus advances to total deposits negatively influences profitability although insignificant while the ratio of NPLs to loans and advances negatively influences profitability. The investigation also showed that there exists a strong linkage between performance interims of CRM and profitability with regards to loan performance. The study findings are not congruent to the current study findings

Li and Zou (2014) executed a survey on the influence of credit risk management on the profitability of a commercial bank in Europe. The findings revealed that there is a negative association between CRM and commercial banks' profitability. Between the two credit risk management proxies, and NPLs ratio has a strong impact on both ROA and ROE while Capital Adequacy Ratio has a

negligible impact on both ROA and ROE. The study findings are not parallel to the current study findings.

Kolapo et al. (2012) delved into the effect of credit risk on profitability in Nigeria. The study results indicated that the effect of credit risk on the performance of the bank as measured using ROA of banks exhibit a cross-sectional invariant trend. The same results were established by other researchers as Tenguh and Achou (2008) and Musyoki and Kerubo (2011). The current study findings are not similar to those study findings.

Poudel (2012) carried out an investigation to examine the impact of credit risks on the profitability of commercial banks in the case of Nepal. The study results revealed that all the indicators have an opposite effect on the financial performance of commercial banks. This study's findings are not congruent with the current study findings.

Essendi (2013) examined the effect of credit risk management on the loan portfolio among SACCOs licensed by SASRA, a case of Nairobi County. The study findings indicated that all SACCOs had adopted a management policy concerning loan risks and it was evident from all the studied SACCOs that they had incorporated various contributions from different stakeholders during the process of formulation of appropriate credit policies. The study findings are not congruent with the current study findings.

Ndwiga (2010) explored the effect of credit risk management practices on the financial performance of Kenyan licensed microfinance institutions. The study concluded that Kenyan MFIs have adopted different CRM practices such as risk monitoring, identification of risk, risk analysis, and risk assessment and the outcome was that there is a positive association between credit risk management and financial performance of Kenyan MFIs. The study findings are not in line with the current study findings.

5.3.3 Liquidity Risk and Financial Performance

The study established that liquidity risks have a positive significant association with financial performance but they do not have a statistically significant effect on financial performance. This study finding is in line with a study conducted by Hakimi and Zaghdoudi (2017), which explored the impact of liquidity risk on bank performances in Tunisia. Prior findings guiding the study had revealed that liquidity risk impedes banks' performance to a large extent. The study findings revealed that inflation and the international financial crisis have a negative impact on the bank's performance. However, the influence of the other bank elements for instance; capital adequacy ratio, liquidity ratio, size, and credit risk are insignificant.

Waweru and Muriithi (2017) assessed the effect of liquidity risk on the financial performance of Kenyan commercial banks. The study used a liquidity coverage ratio over the net stable funding ratio for the measurement of liquidity risk while ROE was used as the parameter for financial performance. The study findings indicated that the net funding ratio is negatively related to the profitability of the bank both in the short run and long run while liquidity coverage ratios have no impact on the financial performances of Kenyan commercial banks short-term and in the long term. This study finding is congruent with the current study finding.

A study conducted by Sohaimi (2013), undertook an exploration to analyze liquidity risks and disclosures and to establish the association between liquidity risks and financial performance of banking systems in Malaysia. The Financial performance indicators are deposits, liquidity gaps, cash, and NPLs. The study concluded that liquidity risk influences the banks' capital reserve to a large extent, with NPLs aggravating the liquidity risk. The study findings were not in tandem with the current study finding.

Sohaimi (2013) undertook an exploration to analyze liquidity risks and disclosures and to establish the association between liquidity risks and financial performance of banking systems in Malaysia. Financial performance indicators were deposits, liquidity gaps, cash, and NPLs. The study concluded that liquidity risk influences the banks' capital reserve to a large extent, with NPLs as the aggravating the liquidity risk. The study findings were not in tandem to the current study findings.

5.3.4 Operational Risk and Financial Performance

The study revealed that there was no significant association between operational risks and financial performance but on the other hand, revealed that there was a significant positive relationship between them. This is contrary to the study by Okeke, Aganoke, and Onuora (2018), which examined operational risk management and firm performance using chosen banks in Edo estate, Nigeria. The survey aimed at investigating the impact of process risk, people risk technology, and system risk, and the external risk variables on organization performance. The survey established that an individual's risk variable had a negative significant effect on performance in the region. The process risk variable had a negative impact on performance, technology, and system risk had a strong negative impact on banks' performance. Similarly, the external risk variable had a positive insignificant influence on banks' performance in Edo state. It was inferred from the study that there exists a strong negative impact between operational risk management and bank performance in Edo state.

However, the current study findings are in line with the study conducted by Meshack and Mwaura (2016), which sought to establish how operational risk management practices influenced Tanzanian commercial bank financial performance. The outcome inferred that the insolvency risk, operational efficiency, and credit risk had an impact on the financial performance during the time

frame. Musiega, Clive, and Siminyu (2017) carried out an investigation to ascertain the impact of operational risk on the financial performances of Saccos in Kakamega County. The study established that there exists a strong positive linear association between financial systems and the financial performance of deposit taking SACCOs in Kakamega.

.

5.3.5 Market Risk and Financial Performance

The study revealed that there was no significant association between market risks and financial performance but on the other hand, revealed that there was a significant negative relationship between them. This in line with the study conducted by Kassi, Rathnayake, Louembe, and Ding (2019), which was carried out to examine the effect of market risk on the financial performance of 31 non-financial firms quoted in Casablanca Stock Exchange in Morrocco. ROE, Profit margin, and ROA were used as the parameters of measuring financial performance. The extent of financial leverage, gearing ratio, and book to market value was used to measure the market risk. The findings revealed that various market risk measures have a strong negative impact on firms' financial performances.

A study by Kolapo and Fapetu (2015) delved into interest rate risk and performance of Nigerian deposit money banks (DMBs). ROA was used to measure performance while interest rate risk indexed was measured using average lending ratio and interest rate diversity. The study findings revealed that each measure of interest rate risk has an insignificant effect on bank performance. This is in tandem with the current study findings.

Zainol and Kassim (2010) studied the impact of changes in the interest rate on the return rate of Islamic banks and the level of deposits in the traditional Malaysian Islamic banks. The study

findings showed that the return rate of Islamic banks and traditional interest rates of the bank exhibit long-run equilibrium and possess some bi-directional causality among them. Again, the deposits and rate of return of Islamic banks respond strongly to variations in the traditional interest rates implying that when the interest rates of conventional banks increase, there will be a transfer of funds to traditional banks from Islamic banks. This study finding is in agreement with the current study finding.

Muriithi, Muturi, and Waweru (2016) surveyed to explore the impact of market risk on financial performances of Kenyan commercial banks. The indicators of market risk included financial leverage, foreign exchange, and interest rates vulnerability while measures such as ROE were utilized to assess financial performance. The study used financial ratios and balance sheets components for the 43 registered Kenyan commercial banks. The findings revealed that there exists a negative link between financial leverage and foreign exchange on bank profitability.

5.4 Conclusions

The study sought to determine the effects of financial risks on the financial performance of deposit taking SACCOs in Kenya. The market risk was found to have a positive insignificant correlation with the financial performance which indicates there was no effect of market risk on the financial performance of deposit taking SACCOs in Nairobi County, Kenya. Credit risk has a positive strong significant correlation with the financial performance of deposit taking SACCOs which indicates that an increase of credit risk by one unit leads to an increase in financial performance when market risk, liquidity risk, and operational risk are held constant. Liquidity risk reported an insignificant relationship with the financial performance of deposit taking SACCOs in Nairobi County, Kenya, this implies that decrease or increase of this variable does not have any effect level on the financial performance of deposit taking Saccos in Kenya, Nairobi County, during the period of the study.

The operational risk presented a significant negative correlation with the financial performance of deposit taking SACCOs which implied that an increase of operational risk leads to a decrease in the financial performance of deposit taking SACCOs. The various diagnostic test carries out show the data used was suitable for the analysis and selected random effect model as suitable to explain the relationship between the variables used in the study.

The entire random regression model was significant for the study since the p-Value was significant and this shows that the model used and variables analyzed were appropriate to explain the association between financial risks and financial performance. However, deposit taking SACCOs should examine the relationship between financial performance and other variables not used in this study to mitigate the declining rate of financial performance experienced.

5.5 Recommendations

It is imperative that this problem of financial risks ought to be addressed to ensure that deposit taking SACCOs have their investment protected and receive worthy dividends for the members and consequently for a country to achieve a recommendable economic growth. From the results obtained, it is recommended that the board of management of deposit taking SACCOs should boost their capacity in credit analysis and loan review procedures. Establish Perfect credit policies and lending guidelines to be adhered to. Management should also oblige to make sure that the lending terms and conditions followed during loan approval. Established and documented lending policies should be approved by credit management and made aware of all employees. This eventual will reduce the loss of non-performing loans and improve the asset quality management which raises deposit taking SACCOs expenses and therefore increase financial performances. It is also acclaimed that the deposit taking SACCOS should monitor the loan and advances to total deposits ratio regularly which may negatively influence SACCOS' profitability.

Operational risk has reported a significant influence on financial performance, from the finding is it recommended that Deposit taking SACCOs should mold a permanent and improve its risk mitigation techniques and is also indispensable to make all staff aware of risk issues they are exposed to. The techniques and methodology accepted and adopted should be in line with the regulations of SASRA, that SACCOS are required to provide capital for operational risk. DT-SACCOs are bidding to cultivate practicable internal control approaches for the determination of operational risks exposed to at a given time and also put credible and dependable control processes, which should be tailored to cover and be in support to the implementation and reviewing of operational risks method adopted. DT-SACCOS's internal audit group is mandated to conduct consistent reviews of the operational risk management involvement of the board of management and senior portfolio managers of DT-SACCOs are expected to participate in risk management. Therefore any guideline and measures established by the SASRA on operational risks mitigations and management should be wholly followed to ensure all risks are well alleviated and this will lead to an increase in DT-SACCOs financial performance reported.

5.6 Limitation of the study

The study was restricted to only four variables that influence the financial performance of deposit taking SACCOs in Kenya, Nairobi County. Other factors can be used to measure financial risks and were not all examined in this study. Hence the interpretation of the results obtained is only applicable to the four variables used in this study. The period in which this study covered was 5 years only. This short period is not sufficient for the study to draw long term inferences.

Another limitation of this study is that cannot be generalized to all SACCOS since it only covers deposited taking SACCOs in Nairobi county even though other SACCOs in different part of the

country offer similar services and also exposed to financial risk problems hence the finding for this study is only limited to Deposit taking SACCOS located only in Nairobi county.

5.7 Recommendations for Further Study

Exploring the effect of financial risk on financial performance is of great importance to the policymakers at SASSRA, SACCO practitioners, and consultants. However, the current study was carried out in the SACCO context, and the same study could be carried out across other financial institutions to establish if the study findings will hold. The study was only carried out in Nairobi, further studies can be conducted out of the Kenyan context, they can be conducted in the African or global jurisdictions to establish whether the study findings would hold.

The study only considered the financial risk aspects of credit risk, liquidity risk, operational risk, and marketing risk. A study can be conducted to ascertain if there are other financial risk aspects. Additionally, further studies can be conducted to ascertain if there are factors that moderating the relationship between financial risk and financial performance.

This study only used secondary data sources, a subsequent research should be undertaken applying primary data from various financial institutions. This can either complement or criticize the finding of this study. Multiple linear regression and correlation analysis were applied in the study; other analysis techniques for example cluster analysis, discriminant analysis, Granger causality, and factors should be incorporated in the subsequent research.

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APPENDICES

Appendix I: Secondary Data Collection Sheet

Name of DTS:

Year of Registration:

			Years				
Variable	**Proxy**	**Measurement**	2014	2015	2016	2017	2018
Financial Performance	ROE	PBT *100 / Total Assets					
Credit Risk	Loan Delinquency	Total Delinquent Loans/Total Loans *100					
Liquidity Risk	Liquidity Reserves	Total Liquid Reserve/Total Saving Deposits*100					
Market Risk	Financial Leverage	EBIT/EBIT-Interest *100					
Operational Risk	Operating Expense Ratio	Operating Expense/Total Assets*100					

Appendix II: Authorization Letter

The Data Manager,

Sacco Societies Regulatory Authority,

P.O Box 25089-100

Nairobi,

Dear Sir/Madam,

RE: DATA COLLECTION

I am a student at KCA University pursuing a Master of Science in Finance and investment, carrying out academic research on the effects of financial risk on the financial performance of deposit Taking SACCOs in Nairobi County, Kenya. I am seeking permission to be able to access data at SASRA database for the DT- SACCOs for the period beginning January 2014 to December 2018.

My research will be focusing on credit risk, liquidity risk, operational risk, and market risk. I wish to you that the information provided will remain confidential.

I look forward to your support.

Thank you.

Yours Sincerely,

Mwikoma Judith Achieng'

Appendix III: List of DT-SACCOs in Nairobi County, Kenya

1	Afya Sacco Society Ltd
2	Ardhi Sacco Society Ltd
3	Asili Sacco Society Ltd
4	Chai Sacco Society Ltd
5	Chuna Sacco Society Ltd
6	Elimu Sacco Society Ltd
7	Fundilima Sacco Society Ltd
8	Harambee Sacco Society Ltd
9	Hazina Sacco Society Ltd
10	Jamii Sacco Society Ltd
11	Kenpipe Sacco Society Ltd
12	Kenversity Sacco Society Ltd
13	Kenya Bankers Sacco Society Ltd
14	Kenya Police Sacco Society Ltd
15	Kingdom Sacco Society Ltd
16	Magereza Sacco Society Ltd
17	Maisha Bora Sacco Society Ltd
18	Metropolitan National Sacco Society Ltd
19	Mwalimu National Sacco Society Ltd

20	Mwito Sacco Society Ltd
21	Nacico Sacco Society Ltd
22	Nafaka Sacco Society Ltd
23	NSSF Sacco Society Ltd
24	Nation Sacco Society Ltd
25	Safaricom Sacco Society Ltd
26	Sheria Sacco Society Ltd
27	Stima Sacco Society Ltd
28	Tembo Sacco Society Ltd
29	Ufanisi Sacco Society Ltd
30	Ukiristo na Ufanisi wa Anglicana Sacco Society Ltd
31	Ukulima Sacco Society Ltd
32	Unitas Sacco Society Ltd
33	United Nations Sacco Society Ltd
34	Wana-Anga Sacco Society Ltd
35	Wanandege Sacco Society Ltd
36	Waumini Sacco Society Ltd

Appendix IV: Data Analysis Sheet

SACCO	Year	ROA	Credit risk	Liquidity Risk	Operating Risk	Market risk
1	2014	0.001304	0.035	0.012599	0.010699	7.279904
1	2015	0.001965	0.035	0.021845	0.008808	7.055046
1	2016	0.001348	0.035	0.021902	0.006626	3.762813
1	2017	0.001434	0.035	0.022319	0.006184	5.232609
1	2018	0.001448	0.035	0.021815	0.005053	4.421462
2	2014	0.006587	0.0254	0.020524	0.010409	1.020637
2	2015	0.007678	0.0254	0.020918	0.010029	1.012955
2	2016	0.008951	0.0254	0.02082	0.012469	1.121273
2	2017	0.010761	0.0254	0.02046	0.01101	1.110929
2	2018	0.01	0.0254	0.021441	0.00945	1.325214
3	2014	0.010926	0.000776	0.023722	0.042585	8.652858
3	2015	0.019141	0.001233	0.004512	0.081516	5.07072
3	2016	0.015902	0.004693	0.00357	0.093131	6.5848
3	2017	0.034574	0.005684	0.028545	0.047511	3.210021
3	2018	0.021908	0.006732	0.033468	0.049503	4.389381
4	2014	0.045459	0.075312	0.01753	0.027981	2.428968
4	2015	0.039475	0.113664	0.029906	0.019352	3.062502
4	2016	0.023966	0.111561	0.033257	0.017132	4.256578
4	2017	0.021449	0.111172	0.031958	0.028777	4.046731
4	2018	0.025574	0.103392	0.031052	0.03377	3.644231
5	2014	0.179328	0.004772	0.046123	0.127302	1.12966
5	2015	0.086149	0.004578	0.105344	0.084642	1.2925
5	2016	0.119003	0.00308	0.069712	0.093116	1.114241
5	2017	0.029768	0.003969	0.055215	0.081476	1.43308
5	2018	0.03559	0.000263	0.063155	0.08323	1.323541
6	2014	0.03617	0.003778	0.007098	0.021702	1.5
6	2015	0.036907	0.007895	0.0067	0.016717	1.588235

6	2016	0.050124	0.007968	0.013564	0.020852	1.906
6	2017	0.050464	0.006778	0.018988	0.021494	1.164815
6	2018	0.04025	0.007444	0.015589	0.01288	1.1
7	2014	0.013208	0.06	0.082168	0.07925	1.000008
7	2015	0.020892	0.06	0.138703	0.125352	1.000007
7	2016	0.021637	0.06	0.142667	0.129822	1.000006
7	2017	0.02235	0.06	0.14747	0.134101	1.000005
7	2018	0.024956	0.06	0.161471	0.149738	1.000004
8	2014	0.728065	0.06	0.082168	0.043684	1.000015
8	2015	0.506228	0.06	0.138703	0.030374	1.00003
8	2016	0.711859	0.06	0.142667	0.042712	1.000018
8	2017	0.252116	0.06	0.14747	0.015127	1.000046
8	2018	0.370492	0.06	0.161471	0.02223	1.00003
9	2014	0.534797	0.06	0.075521	0.032088	1.000016
9	2015	0.480872	0.06	0.172537	0.028852	1.000032
9	2016	0.422496	0.06	0.164974	0.02535	1.000025
9	2017	0.533168	0.06	0.175639	0.03199	1.00002
9	2018	0.54902	0.06	0.174857	0.032941	1.000015
10	2014	0.000455	0.0412	0.005539	0.003565	13.81371
10	2015	0.000477	0.0412	0.01127	0.003736	13.81371
10	2016	0.000493	0.0412	0.011773	0.003866	13.81371
10	2017	0.000292	0.0412	0.017497	0.0055	7.998099
10	2018	0.000292	0.0412	0.0174	0.005499	7.998099
11	2014	0.012308	0.0454	0.036953	0.022857	8.928571
11	2015	0.01072	0.0454	0.035531	0.015757	8.630539
11	2016	0.009292	0.0454	0.033964	0.012705	9.804112
11	2017	0.010093	0.0454	0.035786	0.020275	8.237621
11	2018	0.002198	0.0454	0.036953	0.014498	28.70553
12	2014	0.044928	0.001548	0.00972	0.026138	2.922292

12	2015	0.019426	0.002465	0.007245	0.02084	4.543243
12	2016	0.02004	0.002573	0.007351	0.021499	4.543243
12	2017	0.029841	0.001027	0.005982	0.017361	2.922292
12	2018	0.052749	0.001023	0.020204	0.021112	1.854321
13	2014	0.05137	0.06	0.0132	0.038813	3.733333
13	2015	0.063209	0.06	0.01248	0.034846	2.717949
13	2016	0.04739	0.06	0.016268	0.019231	2.652174
13	2017	0.034345	0.058661	0.008218	0.060502	3.067643
13	2018	0.0302	0.014251	0.005438	0.052166	2.945684
14	2014	0.03	0.008182	0.033333	0.1	1.166667
14	2015	0.029319	0.006696	0.05083	0.08954	1.162162
14	2016	0.025586	0.020873	0.045709	0.095949	1.194444
14	2017	0.028308	0.025647	0.100355	0.042791	1.186047
14	2018	0.021965	0.028079	0.106716	0.047977	1.342105
15	2014	0.024558	0.05654	0.123514	0.185509	8.634151
15	2015	0.026349	0.084004	0.129164	0.171009	8.827869
15	2016	0.027356	0.114983	0.127272	0.160404	7.749364
15	2017	0.025266	0.077057	0.124261	0.16692	7.105601
15	2018	0.02785	0.071102	0.135657	0.173436	6.883196
16	2014	0.016975	0.0454	0.030463	0.031525	8.928571
16	2015	0.01567	0.0454	0.026666	0.023031	8.630539
16	2016	0.012856	0.0454	0.028794	0.017578	9.804112
16	2017	0.013991	0.0454	0.029194	0.028105	8.237621
16	2018	0.002511	0.0454	0.030463	0.016561	28.70553
17	2014	0.022176	0.247875	0.015428	0.044203	2.577683
17	2015	0.021593	0.02907	0.02029	0.045513	3.008772
17	2016	0.027792	0.023833	0.025361	0.04317	2.767674
17	2017	0.037798	0.038754	0.032161	0.045643	2.079626
17	2018	0.033654	0.033192	0.036825	0.105116	2.489405

18	2014	0.019824	0.031878	0.128838	0.041559	4.573655
18	2015	0.011524	0.097414	0.190211	0.038113	7.237084
18	2016	0.078766	0.000619	0.171427	0.044187	1.136607
18	2017	0.01124	0.086078	0.165596	0.03675	7.87517
18	2018	0.015589	0.079543	0.152586	0.03796	5.792913
19	2014	0.006263	0.0554	0.036082	0.127788	8.928571
19	2015	0.005474	0.0554	0.059668	0.111647	8.630539
19	2016	0.00372	0.0554	0.069537	0.091745	9.804112
19	2017	0.00358	0.0554	0.062208	0.056741	8.237621
19	2018	0.000866	0.0554	0.015381	0.090769	28.70553
20	2014	0.024278	0.03956	0.071875	0.042775	6.02381
20	2015	0.022517	0.03956	0.109288	0.03698	5.487177
20	2016	0.028111	0.02	0.086646	0.017082	3.930404
20	2017	0.02563	0.02	0.080585	0.015575	3.930404
20	2018	0.01651	0.052	0.083655	0.027115	5.487177
21	2014	0.012153	0.0454	0.02442	0.022569	8.928571
21	2015	0.014151	0.0454	0.061056	0.0208	8.630539
21	2016	0.011889	0.0454	0.046031	0.016255	9.804112
21	2017	0.0109	0.0454	0.07264	0.021896	8.237621
21	2018	0.002215	0.0454	0.079973	0.014607	28.70553
22	2014	0.03447	0.0526	0.036082	0.075835	2.3
22	2015	0.028292	0.0526	0.059668	0.061565	2.336371
22	2016	0.032402	0.0526	0.069537	0.054992	2.20655
22	2017	0.029447	0.0526	0.062208	0.059881	2.206699
22	2018	3.55E-02	5.26E-02	1.54E-02	0.05263	2.058834
23	2014	2.33E-05	4.93E-05	1.80E-05	2.33E-05	4.285838
23	2015	2.65E-05	5.69E-05	3.32E-05	2.81E-05	4.126657
23	2016	4.05E-05	2.13E-05	3.84E-05	3.27E-05	2.885957
23	2017	6.35E-05	1.36E-05	5.11E-05	3.46E-05	1.984155

23	2018	6.08E-05	1.06E-05	6.17E-05	1.75E-05	2.002366
24	2014	0.007594	0.067461	0.07365	0.043995	8.928571
24	2015	0.006981	0.091761	0.101639	0.042893	8.630539
24	2016	0.006056	0.061904	0.113245	0.054696	9.804112
24	2017	0.006776	0.067134	0.121628	0.050662	8.237621
24	2018	0.00156	0.069336	0.083363	0.0541	28.70553
25	2014	0.03021	0.00021	0.039752	0.009295	2.948718
25	2015	0.029268	0.000609	0.047606	0.027967	2.977778
25	2016	0.030369	0.000623	0.043093	0.01309	3.068966
25	2017	0.032212	0.000511	0.037941	0.038995	3.418653
25	2018	0.014362	0.000318	0.035803	0.053501	6.464038
26	2014	0.058073	0.001911	0.015172	0.007445	1.051282
26	2015	0.045778	0.003405	0.011433	0.005466	1.119403
26	2016	0.063379	0.001604	0.035448	0.003803	1.06
26	2017	0.071854	0.000728	0.052974	0.004666	1.006911
26	2018	0.072363	0.001929	0.058035	0.005106	1.003882
27	2014	0.003312	0.0554	0.019102	0.067573	8.928571
27	2015	0.003294	0.0554	0.018944	0.067185	8.630539
27	2016	0.002764	0.0554	0.035195	0.068149	9.804112
27	2017	0.003083	0.0554	0.035316	0.048866	8.237621
27	2018	0.000673	0.0554	0.008143	0.070558	28.70553
28	2014	0.00989	0.0456	0.0456	0.105495	3.333333
28	2015	0.012833	0.052	0.0472	0.101678	2.846154
28	2016	0.016315	0.0576	0.036	0.104607	2.588235
28	2017	0.009606	0.0467	0.0327	0.117195	4.1
28	2018	0.012739	0.0523	0.0329	0.126479	3.714286
29	2014	0.011945	0.107125	0.035152	0.100233	5.086957
29	2015	0.014355	0.113093	0.04339	0.096942	4.312469
29	2016	0.000379	0.106251	0.037296	0.095487	92.04742

29	2017	-0.00053	0.131764	0.039663	0.007607	-52.1321
29	2018	-0.00117	0.081395	0.042684	0.009201	-11.3124
30	2014	0.001255	0.107125	0.11453	0.108106	38.09256
30	2015	0.00054	0.113093	0.167097	0.110077	88.81383
30	2016	0.006361	0.106251	0.160492	0.106166	8.187144
30	2017	-0.05579	0.131764	0.146707	0.097146	0.25013
30	2018	0.031249	0.081395	0.134917	0.050259	2.41469
31	2014	0.03367	0.001683	0.025979	0.043785	3.415574
31	2015	0.030463	0.002522	0.036457	0.039615	3.415574
31	2016	0.030731	0.002653	0.037398	0.039963	3.415574
31	2017	0.00341	0.000276	0.03984	0.032147	21.97127
31	2018	0.003377	0.000256	0.039446	0.031844	21.97127
32	2014	0.062648	0.1232	0.065	0.057329	1.603774
32	2015	0.049409	0.1048	0.072	0.05478	1.75
32	2016	0.041369	0.1134	0.066	0.053115	1.888889
32	2017	0.026481	0.084	0.0935	0.055206	2.440678
32	2018	0.015705	0.0732	0.0942	0.050085	3.297297