INFLUENCE OF FIRM SIZE ON THE RELATIONSHIP BETWEEN CREDIT RISK AND LOAN PERFORMANCE OF DEPOSIT TAKING SACCOS IN KENYA

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To my wife; Linda Wambua, mother; Teresa Muthoni Njiru, Dennis Wambua my brother, Lilian Wambua my sister and my friends

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ABSTRACT

Deposit-taking SACCO (DTS) sector in Kenya is exposed to many risks which present themselves from both the interior and outside ecology in which they operate. SACCO's fiscal feasibility and longstanding sustainability are endangered by credit risk that poses a crucial test in spite of development in the segment. The investigation aimed at exploring the influence of firm size on the relationships amid credit risk and loan performance of deposit taking Saccos in Kenya. The investigation applied a mixed research design that constituted of descriptive research design and non-experimental design. The target populace was the 175 DTSs licensed by SASRA by December 2017. A census was carried out targeting all the deposit taking Saccos regulated by SASRA as at 2017. The data was obtained from audited financial statement submitted to SASRA for five years from 2013 to 2017. Financial ratios were computed using Excel to get the research variables. The secondary data obtained from SASRA was from 135 Saccos yielding a response rate of 77.143% response out of the targeted 175 Saccos. The fixed effect model was tested for a number of essential classical assumptions of homoscedasticity, autocorrelation, normality of the residuals and of cross-sectional independence and multicollinearity of the predictor before the model could be adopted. The assumptions of normality, homoscedasticity and cross-sectional independence were violated thus a generalized least squares (GLS) model was adopted which allowed for the violations. The model showed that credit risks significantly influence loan performance (Chi-square =14.86, p-value=0.001). The coefficients of capital adequacy and loan advance ratio in the model found to be significant at level 0.05 with p-values of 0.002 and 0.007 respectively which are both less than 0.05. The findings from the inferential analysis showed that capital adequacy had a significant relationship with loan performance (β= -0.240, p-value = 0.010). The study also found the loan advance ratio was also found to have a significant relationship with loan performance (β= 0.091, p-value = 0.000). The results showed that credit risks significantly influence loan performance. Further it was realized that capital adequacy had a significant relationship with loan performance. The study also found the loan advance ratio was also found to have a significant relationship with loan performance. The moderating variable, firm size was measured as the natural logarithm of the total assets and was also found to significantly affect loan performance but does not moderate the relationship between loan performance and credit risk. A conclusion was drawn from the study that capital adequacy significantly influences the loan performance of deposits taking Saccos in Kenya. The study also concluded that loan advance ratio (LAR) significantly influence the performance of loans. It was recommended that Deposit Taking Saccos should ensure that they retain high capital adequacy ratios in order to realize good performance of loans. It was also recommended that the SACCOs should establish an optimum loan advance ratio in order to realize better performance of loans.

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ABBREVIATIONS AND ACRONYMS

ACCOSSCA - Africa Confederation of Cooperative Society Savings and Credit

Association

ATMs – Automated Teller Machines

DTS – Deposit Taking Saccos

FOSA – Front Office Services Activity

ICA – International Co-operative Alliance

LAR - Loan and Advance Ratio

NPLs - Non-Performing Loans

SACCOs – Savings and Credit Co-operative Societies

SASRA - Sacco Society Regulatory Authority

WOCCU - World Council of Credit Unions

DEFINITION OF TERMS

Agency Relationship - Contract that arises when one or more individuals (principals) involve another individual (agent) to accomplish certain facilities on their behalf, which may encompass allotting some power to decide to the agent (Jensen & Meckling, 1976).

Credit risk - Is the exposure of banks when a borrower (client) refuses to honor his or her obligations when due or on maturity. It is the probability of losing the due advance mostly or absolutely, because of credit occasions (Coyle, 2000).

Loan Performance - a idiosyncratic measurement of how good a financial institution could utilize resources from its main business source and create incomes (Thisaka, 2017).

Firm Size – workers per institution, staffs per firm, sales volume per company, and value added per company (Cyert & March 1999)

Information asymmetry - A circumstance where entrepreneurs or supervisor find out about the possibilities for and dangers confronting their business, than do banks (PWHC, 2002)

Multicollinearity - Is the presence of a linear relationship among the independent variables, Kumari (2008)

CHAPTER ONE

INTRODUCTION

This chapter entails a background to the study, credit risk in deposit taking Sacco's in Kenya, credit risk on loan performance of Saccos, research problem, general objective inclusive of the specific objectives, research hypothesis, significance and the scope of the study.

1.1 Background of the Study

Saving and Credit Co-operative Societies can be described as independent establishments of people who are joined deliberately to fulfil their regular financial and communal requirements and desires through mutually-owned and representatively-controlled undertakings, which are sorted out and guided by the principles of Co-operatives (ICA, 2014). The Saccos are guided by the standards of self-improvement, trustworthiness, receptiveness, self-obligation, majority rule government, quality, value, solidarity, shared minding, proficiency, straightforwardness and responsibility (ICA, 2014). The principle role of a Sacco is to advance the pecuniary and communal welfare of its individuals by allowing them credits to cover their monetary needs and needs, supporting the soul of activity in agrarian or mechanical work and cautious utilization of the savings established locally. WOCCU (2014) has a Vision 2020 initiative which will provide the worldwide credit union movement with actionable items, facilities resources and steps to participate in targeting 50 million new members of the Co-operatives globally. Through digital platforms and in-person empowerment, credit unions around the globe pledge to expand the financial muscles with their Co-operative values.

As at December 2017, the were 175 Saccos regulated and licensed by the regulator (SASRA) in line with Section 26(1) of the Act had aggregate net assets of Ksh.393 billion as per the unverified monetary declarations, hitting Ksh.301 billion in 2016 (SASRA 2017). This development in the co-operative sector was brought out by member savings, capitals of ownership and reserved incomes. Share capital which is a crucial quantifier of a SACCO's economic soundness increased by more than fifty percent to Ksh.58 billion by the end of December 2017 up from Ksh.33 billion in 2016 (SASRA 2017). The licensed and regulated Saccos were handling a total 3,456, 975 members thus in this extent it clearly means the Saccos that submitted their audited financial statements with the Commissioner for Co-operative movement and Development as a legal requirement, a number of them had their

licenses for deposit-taking activities annulled and failed to be renewed for the pecuniary period ending December 2017 due to continued failure to sort out the rebelliousness issues which put to chance the enthusiasm of part stores and budgetary development of the DT business, as per the SASRA end of year Supervision Report, 2017.

SACCOs are exposed to increased default risk; the peril that members who borrow are incapable of paying or risk of failure to pay in time as well as operational risks (Alfred, 2011). Donald *et al.* (2006) describes credit risk solely as the probability that a financial institution debtor or any other party might not comply with its requirements in line with terms and conditions. The SASRA Supervision report (2017) characterized credit risk as the odds of losing the extraordinary credit facility incompletely or absolutely, because of advance occasions (default risk). The more the introduction of a Co-operative Society to credit risk, the more noteworthy the inclination of the SACCO to encounter monetary troubles and the other way around. Budgetary holds are the Societies' capacity to offer ascent to new assets, from exercises or tasks that occur regularly, over a given timeframe, profitability is dictated by the net gain and money comes back from its exercises.

Loans conceded to debtors might be at peril of evasion with the end goal that while co-operative societies broaden credit on the trust that debtors will refund their advances, a few debtors most times neglect to pay and subsequently, monetary organization salary decline because of the need to accommodate an arrangement for the advances. Where a Co-operative society does not have a basis of what proportion of their borrowers will neglect to pay, returns will fluctuate subsequently presenting the establishment to more danger of changeability of their stores. Each Co-operative society bears a level of risk when the general public loans to business and clients and subsequently encounters some credit misfortunes when some debtors cannot take care of their credits as concurred. The supervision of credit chance is a formalized way to deal with any deficiency as they fall due in co-operative social orders through hazard appraisal, creating ways to deal with overseeing it, and moderation of hazard utilizing administrative assets. The methodologies incorporate disseminating to someone else, maintaining a strategic distance from the hazard, limiting the negative impacts of the hazard, and recognizing a few or the entirety of the cures of a specific hazard. Casual chance the board centers around hazard coming from physical or lawful concerns, for example, catastrophic events or floods, fires, dry spells, mishaps, ephemeral and claims as expressed by Huizinga and Demirgue (2010).

Despite the gradual changes and utilization of largely enlightened apparatuses and replicas to determine the exposition of co-operative societies to this risk associated to credit, the rate of loan default in the Kenyan SACCOs is absolutely huge. Similarly, in the Kenyan monetary sector there has been endangered influence of the worldwide fiscal crisis and fiscal downturn, as individuals and financial institutions are likely to scuffle to repay the liabilities when they fall due, thereby resulting in a decline of the attribute of loan portfolio, and profitability in the fiscal system. Opposed to the popular trust that rate of failure to pay in Co-operative Societies is negligible, the statistical results from the Ministry of Industrialization and Enterprise Development reveals a considerable rise in the cumulative figures defaulted by Co-operative Society members every year. From this background, it is amazing to discern that little is clear regarding the level by which Sacco's seize in the implementation of credit hazard supervision.

1.1.1 Global Perspective of Co-operatives

Co-operatives have declared attractive results; turnover of the largest 300 Co-operatives globally increased by 11.6 percent to $2.2 trillion by 2014, similar to Brazil's GDP. The general revenue of almost 2,000 Co-operatives in the 65 states as studied by the Monitor sums up to $2.6 billion. The main 300 Co-operatives are operational in three significant sectors which are the insurance (41 percent), farming and nourishment (27 percent), wholesale and retail (20 percent). Following the three segments are industry and utilities (5%), banking and monetary administrations (4 percent), wellbeing and social care (1 percent), and others (2 percent). Out of the 1,926 Co-agents found in the screen, 1,313 had a complete turnover of over $100 million and are found crosswise over 50 nations. The World Council of Credit Unions (WOCCU) measurable discoveries for the year 2016, detailed a sum of 57,000 Credit Unions (Saccos), found in 105 nations and 6 in landmasses. The worldwide Credit Union System has an aggregate investment fund of $ 1.5 trillion (US dollars) and an advantage base of $ 1.8 trillion (US dollars) from which $ 1.2 trillion (US dollars) included or made up the advance portfolio. The normal worldwide entrance pace of the Credit Union framework was accounted for at 8.2 percent.

The United Nations proclaimed 2016 the Year of Co-operatives to acknowledge and appreciate the important role they have played, and have continued to play, for the last 170 years of their survival. ICA came up with a Blueprint for a Co-operative decade enterprises where they should be appreciated as the heads in the pecuniary, communal and ecological

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sustainability, the commercial prototypical favored by individuals and the leading developing establishment by 2020. Cobia (2008) suggested that Co-operative efforts have come out all over history where from the former times individuals cooperated with the rest to help unmistakable enormous creatures for endurance thus as to accomplish the fundamental jobs that they could not reach on the off chance that they acted separately. Antiquated results uncover that the Babylonians practiced Co-operative cultivating and that the Chinese made investment funds and credit affiliations that were equivalent to those being used in the contemporary period.

In North America, developing land in view for the planting of crops, sifting beans, and outbuilding expanded all normal Co-operative endeavors and concerns. In the United States, the first proper Co-operative business has been discovered to have been created in 1752, this is right around 25 years before the declaration of autonomy was embraced. In the present society, Co-operative budgetary foundations have an impressive offer in the market, with the IMF appraises that overall financial area resources in creating nations, the piece of the overall industry of Co-usable fund was proportionate to 14% in 2004 as revealed by Hesse and Cihak (2007). Chaddad and Cook, 2004 discoveries detailed that Co-operative funds during an emergency would in general report preferable returns over financial specialists claimed reserve funds and acknowledge organizations, as they seek after progressively preservationist speculation approaches. Somewhat, investigation from the IMF proposed that commercial banks in created nations are more steady than other business banks; especially during times when this next to zero funds, as their venture designs, will, in general, be less theoretical and benefits are consequently less eruptive this was accounted for by Hesse and Cihak (2007).

1.1.2 Regional Perspectives of Saccos

Current studies propose that roughly 7% of the African populace is related to Co-operatives (Pollet, 2009). The discoveries from the exploration showed that while Co-operatives have expanded in number and bolster an organized development, the development endures challenges that are related to the absence of voice or successful portrayal in the public arena. the investigation likewise found that particular social insurance instruments related to Co-operatives in Africa are constrained. Clement (2012) detailed, that the foundation of Saccos in Africa has developed bit by bit to the degree that African nations established a Saccos' association in the mainland, Africa Confederation of Cooperative Society Savings and Credit Association (ACCOSSCA), in 1965. ACCOSSCA was set up with the primary goal of

advancing the Co-employable standards, offer protection administrations to the development, and instruct individuals on Sacco issues (Ng'ombe & Mikwamba, 2004).

According to WOCCU (2017), Saccos possess the potential and chance to serve customers or members in regions considered unattractive to banks, like less developed or economically-deprived regions. This has rendered Saccos quite striking to members, consequently increasingly imbedding themselves in the economic segments of several states worldwide (Munyiri, 2006). There has been enormous fraud of finances by Sacco boards and that delinquency in Co-operative Societies had tremendously increased for instance, Alut Kot Sacco in Lira gave credit out Ugx 841,000,000 since 2002 but had only managed to recover 26 percent of the sum by 2010 (Ojwee, 2010). AMFIU report (2007) affirms that about 2 out of 3 Co-operative Societies formally formed were not operational (either dormant or is non-existence) or for some reasons their operations came to a halt. Alfred (2011) reported that there have been enormous issues of managing liquidity for example Barr Sacco in Lira had lack of enough loan portfolio of Ushs.12, 690,000 as well as low profitability resulting into some Co-operative Societies failure to repay loans granted to them with recovery rate of loans advanced to Sacco members inferior in the Gulu Zone

1.1.3 Local Perspective of Saccos

Saccos are self-governing association of group of persons unified voluntarily to intensify their mutual economic wants and objectives through a jointly and in a constitutionally ordered structure. As per the SASRA report 2016, the development and extension of the Sacco subsector from minute prosperity Co-operative organizations to big, countless branch financial setups is an enough evidence to the significance of Saccos in dissemination of inexpensive pecuniary facilities to members of the Saccos of all divide. With the assertive rivalry evident from banks and the rest of the financial establishments, Co-operative Societies must adjust to provident functioning to pull through this diverse competition. The basic structure of Co-operative Societies is what separates them from commercial banks and other microfinance institutions in that they are financial institutions owned fully and managed by affiliates. Co-operative Societies members typically have a mutual tie based on environmental area, business, communal, industry or other attachment. Saccos have enclosed both municipal and secluded segments of the community and therefore established a much wider and profound market infiltration and they are better placed to carry on the operations or activities of serving the population that do not believe in banking (WOCCU, 2009). This

model Co-operative Societies further suggest that it has encouraged them to mitigate risk, execute lending contracts and ease the transaction costs of granting loans (SASRA, 2017).

WOCCU (2016) estimated that the Kenyan Sacco segment is the biggest in Africa. In 2017, Saccos had an aggregated reserve funds of $ 1.5 trillion US dollars and an advantage base of $ 1.8 trillion US dollars out of which $ 1.2 trillion US dollars defined the advance portfolio. The mean worldwide infiltration pace of the Credit Union framework remained at 8.2%, the Sacco development in Kenya plans a noteworthy figure of around 45 percent of the Kenya's Gross Domestic Product.

SASRA Supervision report 2017 recommended that the augmentation and expansion of the Sacco business from brief welfare organization to enormous, numerous branches monetary outfits are apparent to the criticalness of Sacco social orders in the supply of modest money-related assets to Kenyans from all edges of the republic. The Sacco's have along these lines guaranteed that all Kenyans in spite of their financial status can get to administrations identified with reserve funds and credit in a moral and well-organized way. The Front Office Services Activity (FOSA), was a counter to the expanding requests that other money related establishments required for one to work a record with them in the late 1990s that totally prompted massive conclusion of bank offices in less created zones in Kenya. Exceptional appreciation for this development by Sacco's, the FOSA gave the new plan to a considerable lot of low pay workers who were basically precluded from the financial framework. In 2017, the International Co-operative Alliance (ICA) ordered the Co-operative Sector in Kenya number seven (7) on the planet and one (1) in Africa with respect to the quantity of undertakings, participation, capital and grant to national economy. The absolute enrollment of individuals enlisted as utilizing the money related administrations of DT Saccos was at 3.6 Million individuals in 2017, out of whom a large portion of a million is portrayed to have not been dynamic.

The Kenyan DT Saccos segment stood robust with respect to every quantifier of development execution. The all-out resource base of the DT Saccos expanded in 2017 to reach Kshs 393.49 Billion when contrasted with Kshs 342.84 Billion that was obvious in the year 2015. This comprised a 14.8% year to year development rate and was financed in a perfect world by individuals' stores which likewise expanded by a similar rate to reach Kshs 272.57 Billion by 2017 from Kshs 237.44 Billion obvious in the prior years. The credits and advances cumulated a colossal level of the absolute resources, representing 73.42 percent of the all-out

resources and which remained at Kshs 288.92 Billion out of 2017 up from Kshs 251.08 percent in 2016. This upheld a 15.1 percent year to year development rate. Credits have kept up to be the key resources for DT Saccos supporting 73.42 percent of the all-out resource base. This calls for the thought of the nature of the credit arrangement of DT Saccos, with sufficient shield to accommodate any non-reprobate credits. The absolute advance portfolio at hazard, relentlessly estimated as a proportion of the non-reprobate credits to net advances expanded to 5.23 percent from 5.12 percent apparent in 2016. This was directed essentially by the ascent on the non-reprobate credits from Kshs 13.21 Billion of every 2015 to Kshs 15. 57 Billion In 2017. The proportion is over the WOCCU proposed a limit of 5 percent, and far a lot more noteworthy than the SASRA's recommended limit of 3 percent; along these lines calls for increasingly synergistic endeavors in methodologies to alleviate and oversee credits by DT Saccos.

Non-Performing Loans as of December 2017 remained at 5.23 percent higher than the WOCCU's suggested 5 percent (15. 57 Billion) and the Authority's 3%. Various concerns, for example, the capital ampleness degrees in the DT Sacco framework, the job of rating organizations in money orders and the reasonable worth evaluation of DT Sacco resources are the most discussed incitements. Because of these worries along these lines, notable improvements have been done in the SASRA framework. Nonetheless, rising concerns, for example, absence of hazard delicate proportions of the financial soundness and frail solutions for DT Saccos to develop a more grounded hazard the executive's framework come up as deficiencies (Porvali, 2011). While the above research discoveries and proposals give a reasonable view on proper systems or modalities of overseeing credit by business banks, small scale account establishments and other monetary organizations, there is definitely no perceived examination to the scientist, which has been done because of firm size on the connection between credit hazard and advance execution in Saccos.

1.1.4 Credit Risk and Loan Performance of Saccos

According to Harker and Satvros (1998) credit risk in reserving and non-reserve pecuniary organizations influence the efficiency of microfinance's peril management and is presumed to significantly influence its credit performance. As per Pykhtin (2005) credit peril is an essential role of pecuniary establishments in generating utility for stockholders and for its members. Risk management means enlarging the chances of successfulness, thereby lowering the likelihood of disaster and demining the doubt of the general performance of the financial

institutions. Khan (2013) contended that the goal of hazard the executives is to turn away an establishment from being positioned with torment for any inadmissible misfortune. He proceeded to clarify that "unsatisfactory misfortune" is one which either causes an association incapable to accomplish its destinations or really harms its corporate position. Saccos must watch out for the regularly changing miniaturized scale and macroeconomic condition to analyze the dangers in that and pay special mind to methods for tending to these startling hazards. Credit risk is quite important to maximizing the loan performance of DT Saccos. Acknowledging this significance, this research focused on determining the influence of firm size on credit risk of DTSs operating in Kenya and its relationship with loan performance.

The corporate account writing has additionally connected the significance of hazard the board with the investor esteem expansion speculation. This demonstrated banking institutions will participate in hazard the executives' practices and arrangements in the event that it upgrades investor worth, Ali and Luft (2002). Hence, fruitful credit chance either in firms that don't work on banking or in Co-operative societies is relied upon to upgrade the centrality of the firm and amplify the investor riches.

Financial establishments ought to embrace credit risk supervisory and operational practices to expand shareholder esteem by improving the estimation of the business firm. Worth upgrade can emerge from the decrease of the expenses of money related trouble, decrease of duties and tending to the decrease of the likelihood that the monetary organizations might be compelled to give up the positive net present esteem ventures since it comes up short on the inside offered to ascend to assets to do as such. In any case, the administrative hazard avoidance hypothesis recommends that hierarchical heads will try to expand their very own prosperity. This unmistakably proposes the hierarchical leaders of the Saccos may now and again take part in credit chance practices without considering the impacts it might truly have on the individuals from the Society. Completely this comes up when the interests of individuals are not impeccably agreed with those of the administrators of the Co-operative Societies or when they pursue hazard the executive's philosophies intended to encase their very own riches from the impacts of changes in loan costs, product costs, or remote money esteems. Fatemi and Glaum (2010) depicted the strategies that might be taken without respect for the outcomes of these goals for investors' worth amplification. It consequently summarizes that paying little heed to whether investor riches boost or administrative hazard avoidance is the main thrust, support in credit chance is to be basically analyzed. One of the

most urgent practices includes the board of credit hazard, especially for money related foundations and different associations in the budgetary administrations' industry. The expanding expansion in the kinds of companion from people to sovereign governments and the consistently extending assortment as responsibilities from auto credits to complex subsidiaries exchanges have discovered that credit hazard had bounced to the bleeding edge of hazard management led by associations in the monetary administrations' industry (Smith, 1998).

1.2 Statement of the Problem

SASRA (2017) suggested that loans have remained to be the key assets for all Deposit Taking Saccos comprising 73.42% of the total asset base where this called for determination and consideration of the quality of the loan portfolio of DT Saccos, with sufficiently adequate safeguards to provide for any loan facilities which are not performing or are in default. The total loan portfolio at risk, measured as a ratio of the non-performing loans to the total or gross loans increased to 5.23 percent from 5.12 percent registered in 2016. This was spearheaded mainly by the rise on the non-performing loans from Kshs 13.21 Billion in 2016 to Kshs 15. 57 Billion in 2017. The ratio is above the WOCCU recommended optimum of 5 percent, and far much higher than the SASRA recommended optimum of 3 percent; and thus, calls for more exerted efforts in credit management strategies by DT Saccos. DT Saccos have moderately low net institutional capital and do not meet the WOCCU regulatory standard of excellence of a minimum of 10 percent net organizational capital.

In Kenya a several investigations have been conducted on credit risk especially in commercial banks and micro finance institutions. Among these includes Kisala (2014) who conducted an investigation on effect of credit risk supervision standards on loan performance in microfinance institutions in Nairobi, Mwangi & Muturi (2016) on effect of credit risk management on loan repayment performance of commercial banks in Kenya, Thisika (2017) on effect of credit risk management on loan performance in Kenyan commercial banks, Kibor, Ngahu, & Kwasira (2015) on influence of credit risk management on loan performance in commercial banks in Nakuru town, Kinyariro (2016) on influence of credit risk management practices on loan delinquency in savings and credit cooperative societies in Meru County, Nyasaka (2017) on link between credit risk management practices and non-performing loans in Kenyan commercial banks, a case study of KCB group limited. Muriithi, Waweru and Muturi (2016) on effect of credit risk on financial performance of commercial

banks in Kenya, Gweyi (2013) on Credit Risk Mitigation Strategies Adopted by Commercial Banks in Kenya, Mumbi (2012) on relationship between credit risk management practices and the performance of loan portfolio of commercial banks in Kenya, Lagat, Mugo, & Otuya (2016) on effect of credit risk management practices on lending portfolio among savings and credit cooperatives in Kenya, Mbucho (2015) on influence of credit management on the loan performance among microfinance institutions in Kenya, Essendi (2013) on effect of credit risk management on loans portfolio among Saccos in Kenya, Wachira (2017) on effect of credit risk management practices on loan performance of commercial banks in Nyeri County and Mwangi & Muturi (2016) on effect of credit supervision standards on loan performance in deposit taking microfinance banks in Kenya.

While the above investigations' outcomes provide a clear insight on credit risk, there were no adequate investigations instigated on the link between credit risk and loan performance in DT Saccos in Kenya since most of the research work concentrated on commercial banks and micro finance institutions, thus it wouldn't be okay to generalize other studies on credit risk and loan performance to DT Saccos thus there is therefore a knowledge research gap that exists because the issue of credit risk and loan performance has not been tackled in DT Saccos. The study aimed to examine the influence of firm size on the relationship between credit risk and loan performance in DTSs in Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of the study was to determine influence of firm size on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

1.3.2 Specific Objectives

1. To determine influence of capital adequacy on the loan performance of deposits taking Saccos' in Kenya.
2. To establish influence of loan advance ratio on the loan performance of deposits taking Saccos' in Kenya.
3. To examine moderating influence of firm size on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

1.4 Research Hypotheses

H01: Capital adequacy has no significant influence on loan performance of deposit taking Saccos' in Kenya.

H02: Loan advance ratio has no significant influence on loan performance of deposit taking Saccos' in Kenya.

H03: Firm size has no significant moderating influence on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

1.5 Significance of the Study

The outcomes of this investigation will be used to assist or help policy makers when revisiting prudential requirements for DTSs. It is also predicted that non-DTSs will be considered and same regulations drafted and formulated for them. Core capital improves or strengthens the DT Saccos by increasing the amount of cash or reserves available for lending to members based on profit retention. The practice or act ensures members of credit facilities at cheap interest rates, effectiveness and efficiency in products or services rendered by the DT Saccos. The savers who are also the main investors will find the study findings particularly useful in examining whether to increase savings in Saccos or to obtain alternative institutions. Consequentially, they will determine if Saccos are the cheapest source of loan facilities or other avenues existed.

The study outcomes will enable other researchers acknowledge the impact of prudential standards on deposit taking institutions and also pursue the areas suggested for further research. The researchers may also need determine if better capital structure for Saccos existed. The study will positively motivate other researchers to do further studies on the influence of firm size on the link amid credit risk and loan performance of deposit taking Saccos and hence enhance future research with pertinent knowledge on Saccos. The SACCO board of directors, management and staff will appreciate the study findings for advocating effective resource utilization in core business of the Co-operative Societies as opposed to aggressive or unnecessary investment in other financial institutions. The rise in revenue to the Sacco is eventually extended to members' in form of interest on members' deposits, bonuses and dividends. The study results and findings will also increase members' confidence and loyalty to the Sacco subsector due to the safety of their members' deposits by establishing adequate institutional capital levels. It will also encourage exemplary management of credit

risks as they are predicted before occurrence by the early realization mechanisms by the Sacco when filling and submitting returns to SASRA or to the Ministry of Co-operative Development.

1.6 Scope of the Study

The investigation was conducted in the DTSs with some consequences on investment, economic growth and also social development. It covered all the 175 licensed Saccos performing deposits taking business by the end of the year 2017. Therefore, the study was a census of all licensed deposit taking Saccos as at December 2017 in Kenya (See Appendix IV). The investigation studies a five-year period of study ranging from 2013 – 2017.

1.7 Limitations of the Study

The target populace of the investigation was all the 175 DTSs in Kenya where the researcher intended to do a census. The researcher only managed to obtain a balanced panel data for 135 DT SACCOs for the five years period ranging from 2013 – 2017 which represented a 77.143 success rate. Emphasis was also given to balanced panels thereby dropping all the DT SACCOs which had incomplete information or data.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter entails the theoretical appraisal of study, the empirical works review, critic of existing literature, outline of literature, conceptual framework and the investigation gap.

2.1 Theoretical Review

This section explored the most appropriate theories that were in-line with the variables influencing the relationship amid loan performance and credit risk in DT Saccos. These theories included the agency theory, adverse selection theory, asymmetric information theory and institutional theory.

2.1.1 Agency Theory

Agency theory is the contract that comes about when one or more persons (principals) take part with another person who is the agent to undertake certain responsibilities or tasks on their sake, that may necessitate allotting some deciding powers to the agent as defined by Jensen and Meckling (1976). Aboagye, Otchere *et al.* (2014) suggested that the basic agency disagreement in modern organizations comes up due to detachment of ownership and management. The theory supposes that managers or agents may not regularly decide in the greatest consideration of owners or principals instead they further their own self interests. This is further exasperated by the incomplete and asymmetric information between the principal and agent (Urquiza*et al.,* 2010). Therefore, this leads to agency costs such as costs of monitoring managers, costs of averting managers from endangering owners' interests and residual loss the difference in wealth due to measures not being carried out by the principals themselves. The owners themselves may endanger the managers by advocating for policies and laws which only build up the shareholding and not employees' interest. This is imputable to membership growth role where more members join the Saccos due to ever growing dividends policy.

The agency theory recognizes the incitements that emerge from the relationship between an agent and principal. Two significant conditions anyway emerge from this standard operator relationship hence framing the premise of this hypothesis. Right off the bat, there is the issue that emerges where the destinations or tendencies of the chief clashes with those of the operator (Bamberg and Spremann, 1987). In such a manner, it turns into a significant issue for the chief to check or decide the exercises of the operator. This is an exemplary model in

the wake of usage of the administrative system. The drawbacks might be utilized by the operator, for this situation the controller, for his own reasons, therefore, restricting the favorable circumstances gathering to the head, in this the DTSs. This may occur while similarly making it a tough undertaking for the chief to execute his exercises. This hypothesis is connected to capital sufficiency variable where the chief may along these lines require the specialist to attempt unsafe duties or jobs, for example, holding fast to liquidity necessities, capital prerequisites, credit provisioning prerequisites, and speculation necessities oblivious of the up and coming risk as far as making loses (Wanyoike, 2013).

2.1.2 Adverse Selection Theory

The model was brought upon by Pagano and Jappelli (1993) it describes an instance where participation in the market is largely influenced by asymmetric information. When buyers and sellers don't have the same information, this is known as a state of asymmetric information, the information sharing leads to an advancement in the amount of borrowers, a decline in defaults rates and therefore low interest rates. However, if DT Saccos operate in a monopolistic way, there is always a decline in lending in some instances. This is brought about by the information exchanged leads to an rise in borrowing to those who seem to be safe borrowers and also those who seem to be risky borrowers yet the rise in the amount of lending to borrowers who seem to be safe cannot address the full compensation for the decline in the number of risky borrowers. In a case where credit markets are competitive, there is a more probability of lending markets to rise. Contests make the capability of financial institutions to remove rent from their customer and so the sharing of information leads to an rise in competition amid the commercial banks and other fiscal establishments (Jappelli & Pagano, 2003). There is also a further insinuation from the mode, in that the sharing of information lowers the rates of defaulting and cumulative interest while a rise in lending is grasped. This is brought by the credit reference bureaus which promote competition through reducing of data on rent or through imposing co-operation from clients. In some other environments the exchange of information may lead to the probability of lending in markets that do not allow extension of credit facilities. In instances like these therefore, the financial institutions have decided to improve their performance through the raising of welfares of their clients accompanied by the profits realized, (Pagano 2001).

Reasoning why there has been a high credit risk in the Saccos is because the relevant theory to this study and it is caused by inadequate exchange of information mutually between the lender and the borrower and this results in the high non-performing loans, consequently affecting the performance of loan in the DT Saccos. This theory is also linked to loan advance ratio an instance whereby a DT Sacco decides to move further and give credit facilities to agents or customer and lack the worthiness.

2.1.3 Asymmetric Information Theory

Information asymmetry alludes to a circumstance where proprietors of business or heads of foundations find out about the possibilities for, and dangers confronting their business, than do moneylenders (PWHC, 2002) referred to in Eppy (2005). Asymmetric data implies that one gathering has more or preferred data over the other party when settling on choices and exchanges. The diverse data causes a lopsidedness of intensity, for example, when you are attempting to arrange your regularly scheduled compensation, you won't know the sum your manager is eager to pay and your boss won't know the sum you will acknowledge consequently. Right and veritable data is basic for sound monetary choices. At the point when a market encounters contrasts in the data passed out, it can prompt market disappointment (Schrand, 2007).

The hypothesis depicts an occasion where all gatherings engaged with any action don't know significant data. Binks and Ennew (1992) reasoned that apparent data asymmetry achieves two issues for the DT Saccos, moral risk (observing client conduct) and antagonistic choice (settling on botches in credit loaning choices). DT Saccos will think that it is hard to get rid of these issues since it isn't affordable to commit a few stores to check where loaning is for the most part little figures. This is on the grounds that the data required to screen advance applications and to screen the clients who are obtaining isn't promptly accessible to the lion's share of the DTSs.

Information Asymmetry hypothesis is tied down to Loan Advance proportion where clients who plan to acquire advances offices and advances typically have better data about the potential dangers and returns related to such venture ventures for which the assets are coordinated to. The establishment loaning then again do not have sufficient data with respect to the borrower of the credit (Edwards & Turnbull, 1994).

2.1.4 Institutional Theory

Jonsson (2007) instituted this hypothesis and accordingly recommended that associations (firms) look to carry on in manners that will make them be seen as various and therefore singled out for analysis subsequently the organizations will turn out to be progressively comparable in conduct and receive ways to deal with organizations that have just been legitimized. Since the thought of business development and a bigger firm is better a littler firm is implanted in the institutional condition of associations the isomorphic weight will constrain firms to agree completely with the institutional condition. He additionally concocted different speculations that improve the comprehension of firm size, for example, the rule – operator hypothesis that proposed that division of corporate proprietorship and control conceivably prompts self-intrigued activities by chiefs who may grow their organizations or associations or less to expand their advantages or returns, for example, better installments, high investment opportunities and even become progressively lofty. Further, he thought of the vital hypothesis that involves Porter's thoughts of nonexclusive systems that firm or associations can use to achieve generally speaking administration, item separation and center-based mastery accordingly this present a valuable beginning stage when concocting key alternatives or choices.

You (1995) devised four methodologies that accentuate on firm size, for example, the regular smaller scale monetary methodology or also called the innovative methodology in which the firm size of a money related foundation is dictated by specialized or distribution productivity. In addition, he thought of the exchange cost approach or institutional methodology in which firm size is controlled by the exchange cost-effectiveness. Besides he thought of the mechanical authoritative methodology in which the firm size and its circulation are controlled by the market control. The last approach is that of the dynamic models of the size circulation of firms, including the stochastic replicas, life cycle models, and the institutional models. The institutional hypothesis is tied down to the firm size which is the directing variable of the investigation and along these lines, it gives and clears knowledge of the association between firm measure and credit hazard and in this way the advance execution of store taking SACCOS.

2.2 Empirical Literature Review

2.2.1. Loan Performance

A loan is termed as performing if it is not in default, or is not about to be defaulted, with a reasonable expectation that the facility will not enter default even though it has not technically defaulted yet is a performing loan. As a general rule, banks and other financial institutions mostly avoid non-performing loans because there is a high chance that they will not be able to recover the initial amount left on the loan to be cleared, let alone the interest which has accumulated. Loan performance alludes to profitability rate or pace of return of an interest in different advance facilities, along these lines comprehensively it takes an appraisal of the number of clients applying for the loans, the amount they are acquiring, reimbursement of portion sums, security offered against the obtained assets, pace of overdue debts recuperation and the quantity of advance offices on the chain. Credit portfolio alludes to the combined measure of cash given out as advances in various items, to the assortment of borrowers. These credit items may contain Salary advances, bunch ensured advances, singular advances and corporate advances (Puxty et al. 1991). It, in this manner, tends to a lot of customers with credit facilities and the aggregate sum acquired (Wester Paul 1993).

Loan Performance was measured by the Non-Performing Loans (NPLs). Greuning *et al.,* (2000) noted that NPLs are those facilities that do not bring back any revenue. NPLs generally alludes to bad obligations whose recovery is immensely far-fetched on the grounds that they are not being overhauled true to form (CBK, 1997). Credit offices have stayed to be the key resources for DT Saccos where they include 73.42 percent of the complete resource base. In this manner, this calls for satisfactory thought of the nature of the advanced arrangement of DT Saccos with shields satisfactorily to accommodate any non-performing advance offices or items. The complete advance portfolio in danger which is estimated as a proportion of the non-performing advances to net advances expanded to 5.23 percent that is from 5.12 percent enrolled in 2015. This was thus realized for the most part by the ascent on the non-performing credits from Kshs 13.21 Billion out of 2015 to Kshs 15. 57 Billion, (SASRA Report 2016). The proportion was consequently over the WOCCU prescribed limit of 5 percent, and substantially far much than the SASRA suggested limit of 3 percent; and along these lines, this calls for increasingly slanted endeavors in methodologies for credit the executives by DT Saccos. Advance Performance will be along these lines being figured as absolute Non-Performing Loans (NPLs) to Gross Loans and Advances.

2.2.2 Capital Adequacy and Loan Performance

DTSs are mandated to meet the accompanying least proportions; Core capital ought not to go below Kshs 10 million, which ought not to be fewer than 10 percent of the aggregate assets, Institutional capital ought not to be fewer than 8 percent of the aggregate capital lastly center capital ought not to be under 8 percent of aggregate member deposits. The constraints of the center capital prerequisite are that various DT Saccos cannot meet the set edge capital necessities and proportions, Some Deposit Taking Saccos have not set aside the capital from part's stores, troubles in the understanding the constitution of the central capital and resulting computation of the capital proportions.

Diamond (2012) stated that the risk of liquidity is the financial institutions ability to realize or rather make an achievement of its major responsibilities mainly the depositors. Financial institutions are said to be financially stable if they are able to transform its assets rapidly at a reasonable cost or has ease access to cash and cash equivalents. Commercial banks liquidity is measured as a ratio of cash maintained at both the banks and the Central Bank to its total assets. According to Dang (2011), the profit level of the financial institutions rightfully relates to its liquidity level. Minute level of liquidity is a ground rightly inability of the Deposit Taking Saccos. This can lead to termination resulting from Saccos run due to failure to meet customers' demands.

Byrd and Hickman (2012) reported that a high liquidity cushions the commercial banks or other financial institutions against possible depositors run which may influence its overall performance. In addition, rise in liquidity level will result in a Saccos lending to other Saccos experiencing financial distress at high return which therefore results in a bettered performance from the returns. Beasley (2012), recommended that there is an indirect association amid the profit level and the liquidity level. This comes about from the transformation in asset size and liability in the institution. Capital adequacy was quantified by core capital to aggregate assets of the DT Saccos and core capital to aggregate deposits of the DT Saccos.

2.2.3 Loan Advance Ratio and Loan performance

The core objective of deposit taking Saccos is using the monies (deposits) from its members efficiently by the method of loaning or granting finances. In conclusion the advance to sum ratio identifies the financial institution's liquidity and the profitability. The ratio was

computed by dividing the entire gross loans, by cumulative quantity of deposits (Michael, 2014). The figure realized or achieved was expressed as a percentage.

Significantly high loan advance ratio indicates that the financial institution is giving extending more of its reserves in terms of interest-bearing credit facilities and finally that the institutions generates more income. Here the test is the failure to pay the credits in such a case the foundations subject to reimburse the store cash to their individuals, so the proportion is too high puts the money related organization at high hazard. Then again, a very low proportion signifies that the budgetary organizations are at okay, on a similar time the establishments are not using their resources to produce pay. The total advance items constantly appear in the announcement of money related situations for the sake of advances, advances, and financing. It very well may be finished up term advances, Visa receivables, charges receivables, trust receipts, guarantees on clients under acknowledgment attributes, advances or financing to monetary foundations, settling credits and staff advances. All out stores incorporate the two stores from Sacco individuals, stores and situations from the foundations and other money-related organizations. Stores from individuals contain request stores, reserve funds, fixed stores, stores for the extraordinary ventures, stores for currency advertise, stores for debatable instruments and organized stores. As per the Authority's Annual Reports 2017, credits and advances comprised a tremendous extent of the aggregate assets, representing 73.42 percent of the absolute resources and which remained at Kshs 288.92 Billion of every 2017 up from Kshs 251.08 in 2016. This consequently spoken to a 15.1 percent year to year development rate in the store taking Saccos. Hence the examination study considered the advances and stores of the 175 DTSs for the time of five years and figure the proportions where the investigation thought about the measure of credits and stores from the evaluated budget report in the SASRA yearly reports.

2.3 Review of Literature

Kisala (2014) instigated a research on effect of credit risk supervision practices on the performance of loans in microfinance organizations in Nairobi, Kenya. The investigation espoused a descriptive research design which involved an in-depth research on the credit supervision tactics and the connection it has on the performance of loans in the micro finance institution sectors. The investigation utilized primary data gathered using questionnaires and thus it also gathered some secondary data that was gathered from the annual reports for the period ranging 2007 to 2011 of the micro finance institutions. The population of the study was all the nine registered and licensed deposit taking micro finance. These micro finance

institutions are licensed by the central bank of Kenya where the researcher only managed to collect data from five institutions. After the data was collected from the institutions it was therefore analyzed using the multiple regression analysis. The study thus found out that loan performance of micro finance institutions had a momentous association with the credit risk management. In addition, the study revealed that there was a very high variation on the performance of loans that was as a result of the drastic change in the gross domestic product growth rate. It was further realized that the investigation had a negative relationship amid the performance of loans in the micro finance institutions, its interest rate spread and the interest rates that are charged on these loans.

Mwangi & Muturi, (2016) instigated an investigation on impact of credit hazard supervision on repayment performance of the loans of the Kenyan commercial banks. A descriptive research design was adopted since it helped in recitation of the current state of the affairs of its activities or operations as it is currently is at present. The population of the study constituted all the forty-two (42) enlisted business banks working in Kenya where the examination was led at their administrative centers which are altogether situated in the downtown area in Nairobi. The example populace of the investigation was taken from the 42 business banks through a purposive inspecting. The objective populace for the investigation was the representatives working at the 42 business banks in Kenya consequently an example of 54 respondents was drawn utilizing the picked testing procedure. The examination utilized essential information that was gathered utilizing polls. Legitimacy and unwavering quality tests were directed through a pilot study by utilization of a technique by Cronbach Alpha. There after the investigation was done utilizing both subjective and quantitative methodologies and procedures. The gathered information was accordingly investigated utilizing the inferential and elucidating insights. Four study ends were understood that depended on the investigation targets. Right off the bat, the associations credit strategies had a huge beneficial outcome on the reimbursement execution of advance were subsequently the genuine ramifications of this was progressively stringent credit approaches of the associations would have prompted guaranteeing that it's just the credit commendable clients who get advances hence advances execution in to the extent reimbursement is concerned is kept up in an extraordinary and great position. The examination discoveries vanquished with the discoveries of Burns et al (2006) who expressed that credit approaches in associations assume basic jobs in the selection of people and organizations whose bank advance advances to

chance distinguishing proof procedure had a noteworthy impact on the reimbursement execution of advances.

Fredrick (2012) instituted an investigation on determinants of credit hazard supervision on the budgetary exhibition of business banks in Kenya. He consequently endeavored to build up if there existed any connection between the determinants of credit chance administration by utilization of CAMEL model markers and money-related implementation of commercial banks in Kenya. The examination embraced an easygoing exploration plan. The examination utilized auxiliary information that was acquired from the distributions on the banking division overview and the banks' individual fiscal summaries for the period 2006 to 2010. The objective populace of the investigation included all the 42 controlled business banks in Kenya on 31st December 2011. All the business banks which were not inactivity for the expressed period or were under receivership were dropped due to some missing information or the deficiency of the records. After information was gathered, it was dissected dependent on the numerous relapse models and Pearson rank relationship examination. From the discoveries, the examination discovered that there was a solid connection amid the CAMEL parts on the money-linked implementation of business banks in Kenya. The investigation further found out that asset quality, capital adequacy, liquidity and administration competence all had a weak correlation with the financial performance of commercial banks in Kenya. Earnings had a strong correlation with the pecuniary performance of profit-making banks and therefore the investigation settled that CAMEL classical could be utilized as a proxy for the management of credit risk in commercial banks.

Thisika (2017) instigated a study on impact of credit risk supervision on loan performance in business banks in Kenya. The exploration utilized a descriptive research design where the targeted populace was 70 participants drawn from the nine business banks in Bungoma. The targeted populace comprised all the staff in the credit division of the commercial banks which included Co-operative Bank Limited, Kenya Commercial Bank, Barclays Bank, Equity Bank, Standard Chartered Bank, National Bank, Diamond Trust Bank, Bank of Africa and Krep Bank. A Census strategy was in this way utilized with a rundown of all credit division staff at the branch level in the 10 considered business banks in Bungoma. Essential information was gathered utilizing an information assortment poll that had both open and shut finished inquiries. The information was along these lines investigated both subjectively and quantitatively where the topical examination was embraced for the subjective information. It

was subsequently deduced that credit evaluation had a positive and solid connection with non-performing advances. The examination study in this way reasoned business banks ought to have set up composed and endorsed rules on the credit endorsement process. It was additionally settled in the outcomes that the work of a certified credit official since it is significant evaluating the credit value of the clients who acquire accounts. Along these lines, commercial bank staffs ought to be prepared at times to outfit them with applicable and essential abilities since this will go far in decreasing the non-performing credit levels.

Kibor, Ngahu and Kwasira (2015) also carried out a research study on impact of credit risk supervision on the loan performance in banks in Nakuru town, Kenya. The investigation espoused a descriptive research strategy. The target populace of the study comprised of 160 staff working in the credit department from 37 commercial banks with branches. The study utilized primary data gathered by structured surveys to collect data from the respondents. Reliability and validity test were carried out that involved 16 respondents (10% of the respondents') this were aimed at testing the study instruments. After the data was collected it was evaluated applying both inferential and expressive statistics. The investigator established that commercial banks in Nakuru town had effective lending policies that had noteworthy role in credit hazard supervision. It was concluded that commercial banks had competent personnel for appraising prospective borrowers and also that collateral was material in lending policies. Finally, it was also determined that lending policies had notable influence on the presentation of loans in banks. The study concluded commercial banks in Nakuru town adopted credit standards. It was also deduced that putting a bar on the loans advanced to customers in the banking sector could enhance credit risk supervision. The study further concluded that determination of borrowers' credit worthiness is adamant in the management of credit hazards. Finally, credit standards in commercial banks were found to strongly affect their loan performance.

Justus and Kinyariro (2016) carried out a study on impact of credit risk administration practices on advance misconduct in SACCOs in Meru County, Kenya. The exploration utilized a descriptive research structure since it gives an unmistakable knowledge into the examination issue under investigation. The objective populace of the examination was 44 Saccos which have been in presence throughout the previous 5 years and working in Meru County since initiation. The investigation received an evaluation and focused on the credit officials of the selected Saccos. Out of the 44 Saccos each Sacco had a respondent who was

the credit official and subsequently the sum of respondents was 44 which were more than the 30 members in the investigation. Essential information was gathered by utilization of self-managed polls that were given to all respondents. The investigation utilized elucidating insights in the examination of the information gathered where it was coded, altered, and outlined into classes. To connect the connection between advance misconduct and the autonomous factors of the investigation, the scientist utilized a numerous straight relapse model. From the discoveries of the investigation it was uncovered that there existed a solid direct connection between credit hazard controls, assortment strategy and advance wrongdoing in Saccos under examination. In this way, the examination presumed that credit hazard supervision practices altogether impacted advance loans in Saccos in Meru County. The examination suggested that reception of increasingly stringent credit arrangement using a loan hazard the executives' practices in Saccos would be powerful towards obligation recuperation.

Nyasaka (2017) led an investigation on the correlation amid credit advance administration practices and non-performing advances in business banks in Kenya that was a contextual investigation of KCB bunch restricted. The examination design received for the investigation was descriptive. The objective populace of the investigation was 200 credit authorities who were staff at KCB head office and its branches in Kenya. The non-likelihood examining strategy was embraced in the examination in this way the example size utilized in the exploration was the 200 credit officials at the KCB head office and its branches countrywide. The investigation utilized essential information that was accumulated by the utilization of organized polls according to the examination goals in the exploration. Information was examined by the utilization of both subjective and quantitative systems. The examination presumed that business banks ought to think about attributes of the borrower, limit, conditions, and guarantee in credit scoring for either business or corporate advances. The bank under examination had methodologies for allowing credits center around whom, how and what ought to be done at the branch levels and corporate division levels while surveying clients who were acquiring. The investigation presumed that KCB bank had a very much archived strategy on the executives of credit hazard. The investigation likewise inferred that the bank should contact the credit reference authority (CRB) to aid basic leadership to loan their credit clients. Likewise, advance evaluation and resulting endorsements ought to be founded on borrower's ability, character, condition, record as a consumer and guarantee.

Additionally, it was likewise presumed that the bank had a credit manual that archived and expounded the techniques for it to oversee credit offered out to clients.

Muriithi, Waweru, and Muturi (2016) instigated an investigation on the impact of credit advancement on the budgetary presentation of Kenyan business banks. The examination estimated credit hazard by cash-flow to chance weighted resources, resource quality, advance misfortune arrangement, advance development proportions and money related execution by return on value where the investigation secured a time of 2005 to 2014. Explanation of budgetary position parts and money related proportions for 42 directed business banks constantly 2014 were utilized for the investigation. Panel data systems of fixed impacts arbitrary estimation and summed up technique for minutes (GMM) were utilized to cleanse time-invariant invisible establishment and discover the explicit impacts and to control any potential endogeneity issues. The existing connections between factors were done. F-test was utilized to decide the criticalness of the regression model while the coefficient of assurance, inside the organizations and between the organizations R2 were utilized to decide how a lot of variety in the subordinate variable was clarified by autonomous factors. From the examination's discoveries, credit risk had a negative and significant connection with the business banks' productivity. Insufficient resource quality or greater non-performing advances to add up to resource was in this manner identified with worse than average business bank execution both in the short and long run. From the investigation's outcomes, it was additionally deduced that the administrative head of banks should upgrade their ability in breaking down credit hazard and organization of advances of credit.

Gweyi, Olweny, and Oloo (2018) instigated an investigation on the impact of credit risk on the monetary execution of DTSs in Kenya. The econometrics techniques were utilized in the examination and these included evaluating the impact that the chosen autonomous factors like credit advancement and hazardous arrangements had on money-related execution of the Deposit Taking Saccos in Kenya. The targeted populace for the investigation was the 164 permitted and directed DTSs in Kenya and this was for the fiscal year ending December 2016. The investigation received an enumeration and thought about all the enrolled and authorized Saccos for study. Secondary information was gathered from just 135 DTSs reviewed fiscal reports which included over 82.32% of the targeted SACCOs. The secondary information that was gathered from the controller, SASRA was examined utilizing both distinct and inferential insights. The outcome from the investigation demonstrated that credit

risk impacted money-related performance of these DTSs. Moreover, the board advisory groups of the DT Saccos should be increasingly careful in setting up a stringent credit strategy that will not contrarily influence the productivity and liquidity of these DTSs. Finally, the DTSs additionally need to realize how credit arrangement influences their activities along these lines to guarantee powerful and effective usage of stores and expansion of benefit.

Kithinji (2010) directed an investigation on the impact of credit risk that was estimated by the proportion of advances and advances on total resources and the proportion of non-performing advances to net advances and profit for progress on the aggregate resources in Kenyan business banks for the period running 2004 to 2008. The examination discovered that the majority of the surpluses or incomes of business banks was not affected by the measure of credit and non-performing advances. The analyst encouraged that overall the incomes of the business banks rose during the period 2004-2008. Moreover, the benefit of the financial business changed during a similar period however by and large rose hardly during a similar period. The incomes were acknowledged to be commonly low during the investigation time frame. The measure of credit offices reached out to borrowers was moderately high however expected a descending pattern during a similar period. While the degree of advance offices and incomes were generally low and stable, the measure of credit was high and unstable. The outcomes of the investigation suggest that the method of reasoning to consider different factors that could affect the banking industry's execution and furthermore a more drawn out time of the investigation to decide the perfect situation of the banks' presentation.

Nyong'o (2014) did an examination on correlation between the administration of credit chance and non-performing advances in Kenyan business banks. Graphic investigate configuration was embraced for the examination and hence the objective populace of the investigation was all the 43 business banks that were authorized and working in Kenya as at December 2013. This objective populace was suitable for the analyst to address and in this way evaluation was utilized since the populace was effectively open and can be come to in a simple approach. The example size of the examination was all the 43 business banks in Kenya. Essential information for the examination was gathered by utilization of a both open and shut finished poll. Since the investigation utilized both essential and optional information, in this manner the auxiliary information was gotten from the yearly money related reports of the considerable number of banks in Kenya for the time of 5 years from the

year 2009 to 2013. The essential and auxiliary information gathered information was broke down by utilization of both spellbinding and inferential measurements. Measurable Package for Social Sciences (SPSS) form 21 was utilized to examine essential and optional information gathered. From the investigation, it was reasoned that greater part of the business bank had sound frameworks for overseeing credit chance and the senior administration of the business banks ought to create approaches and methods for controlling, checking and recognizing the credit dangers distinguishing. The investigation further inferred that most business banks in Kenya work under a sound credit hazard the executives procedure that diminishes credit default which prompts low non-performing advances. The investigation additionally presumed that business banks should think about potential future changes in monetary conditions while evaluating singular client credits and their credit portfolios.

Njenga (2014) directed an examination on adequacy of credit the executives framework on advance execution of business banks in Kenya. The examination received an elucidating research structure where the investigation further centered around the 9 authorized and directed smaller scale money foundations in Kenya by the national bank. The exploration utilized a registration study whereby the whole populace of the examination was tended to instead of choosing an example. The examination utilized both essential and auxiliary information where the essential information was gathered utilizing organized survey. The information was gathered from optional sources which were the examined monetary reports in the national bank of Kenya which was evaluated for culmination and consistency of the MFIs since the information was quantitative in nature. The investigation discoveries additionally uncovered that albeit most deposit-accepting MFIs executed praise the board rehearses, the complete credit portfolio expanded relentlessly throughout the years. Besides, it was seen that the degree of non-performing advances expanded logically. This pace of this credit default could have been because of poor venture choices by the borrowers because of the absence of expert exhortation by the store taking microfinance foundations on the most proficient method to pick and choose reasonable speculations openings that could yield productivity. The investigation further inferred that some microfinance organizations were somewhat permissive while giving out credit offices to their clients. Furthermore, a portion of the credit official in the foundations had an excess of trust on their clients and in this way neglected to watch all the credit the board rehearses while giving out credit to the clients. This, in any case, prompted ascend in the measure of non-performing advances prompting

poor reimbursement of credit sums by borrowers and hence driving poor monetary execution in the MFIs.

Lagat, Mugo, and Otuya (2016) instigated an investigation on impact of credit hazard the board rehearses on loaning portfolios among SACCOs in Kenya. The investigation embraced an illustrative research plan. The investigation focused on all urban Sacco's which are enlisted under the Ministry of Co-employable Development in Nakuru County. In every one of the Sacco, two administrative positions were legitimately included using a loan the board and explicitly choices on loaning offices specifically these officials were the money administrator and credit supervisor who shaped the key objective respondents for the investigation. A sum of 118 directors in this manner were chosen from the 59 Sacco's working in Nakuru County. In choosing the recognized two members in every one of the Saccos the scientist embraced purposive testing since the back and credit directors were key respondents in every one of the Sacco. Essential information was utilized and was therefore gathered by utilization of a poll which contained 28 inquiries separated into 5 general classifications to get to the executives' practices of credit chance among the Saccos in Nakuru County. The scientist reasoned that larger part of the Saccos had received powerful and productive risk assessment procedures as a method of dealing with their advance or credit portfolio. Besides, a large portion of the Saccos had a few branches and numerous credit items in their loaning portfolio that requires the need to adequately deal with their introduction to credit hazard. It is additionally presumed that hazard recognizable proof was a noteworthy factor to consider because of its positive impact on both the portfolio execution and the choice on the number of advance items to be remembered for the credit portfolio. Hazard examination didn't affect the number of advance items to be remembered for the portfolio in this manner it's a significant determinant of the exhibition of the advance portfolio. It was apparent that hazard observing, and chance moderation were key determinants of both execution of the arrangement of the recognized Saccos and the quantity of advance items in the portfolio. A negative relationship between danger moderation and the presentation of the loaning portfolio was eminent trademark in the examination where it drew out a relationship where more tightly chance alleviation estimates prompted decline in the appropriation of increasingly unsafe advance items and clients or individuals subsequently fundamentally influencing the portfolio consequently.

Murigi (2018) conducted an investigation to ascertain the influence of credit card chance supervision and advance execution in microfinance establishments or banks in Kenya. The investigation embraced an expressive research plan. The objective populace contained 12 miniaturized scale fund foundations considering an example size of 60 respondents made up of 5 respondents from every one of the 12 small scale money banks who were gotten utilizing a purposive inspecting system. The investigation utilized essential information which was gathered utilizing surveys and after it was gathered, it was dissected utilizing an SPSS adaptation 21 where both inferential and unmistakable insights were directed. From the discoveries, the examination found a positive and huge connection between the accompanying factors; credit chance condition, credit evaluation process, credit organization, estimation and checking, inner authority over credit hazard and the advance execution in the MFBs. In addition, the senior administration in the miniaturized scale account banks ought to create stringent arrangements and methods, set up most extreme credit limits, have a framework for observing the state of individual loaning and an autonomous inner control framework for directing the continuous evaluation of the MFBs procedure of the executives of credit hazard.

Kiplimo and Kalio (2017) instigated an examination because of credit chance administration practices on advance execution of microfinance organizations in Baringo County. The exploration received a clear research structure. Target populace of concentrate was 8 supervisors and 87 credit officials in miniaturized scale account establishments. Enumeration system was utilized in light of the fact that all the branch directors and credit officials in the MFIs were straightforwardly connected or associated with this investigation. The examination utilized essential information which was gathered by utilization of a poll which was favored since it's a simple, modest, proficient and successful apparatus to be regulated by the scientist. After the information was gathered it was dissected utilizing clear investigation or insights and condensed through frequencies' and rates and tables, graphs used to show the information for simple comprehension and examination. Relapse and connection investigation which are inferential measurements were utilized to show the affiliation and course of the examination factors affiliation. The examination found that client credit evaluation significantly affected advance execution of MFIs in the County. The investigation further uncovered that a unit increment in one unit of customer evaluation prompted an expansion in advance execution in MFIs in the County demonstrating that there was a positive connection between client credit examination and advance execution in the MFIs.

Along these lines, there was solid positive connection between's client examination and credit execution of MFIs thus customer evaluation altogether had an impact on the advance execution in MFIs in Baringo County.

Marshal and Onyekachi (2014) did an observational examination on the impact of credit hazard and execution of banks in Nigeria for time of multi-year extending from 1997 to 2011. The investigation considered 5 financial organizations that were chosen from the 20 existing store cash banks in Nigeria during the predetermined examination time frame. The examination utilized critical testing strategies. Auxiliary information was utilized in the examination which was gathered from the yearly fiscal summaries and reports of the enlisted and authorized store cash banks in the example. This auxiliary information comprised both cross-sectional and time arrangement information which was united into a board set of information and further assessed by utilization of board information relapse strategies of examination. From the investigation the examination discoveries result detailed that there was a positive direct connection between the proportion of non-performing credits to net advance and advances (Log of NPL) and banks execution (Log of ROA). The examination further demonstrated that store cash banks should direct an insignificant degree of non-performing advances in their acknowledge portfolio and accordingly this doesn't adjust to their desires. What's more, the scientist likewise found that there existed a positive direct connection between the proportion of complete credit and advances to add up to reserve (Log of L &A) and banks execution (Log of ROA). The investigation end was that an expansion in one unit of credit and advances expands banks execution through premium pay created from the gross advances and advances. The examination didn't perceive the impact of different factors such credit misfortune arrangement which are theoretically known to influence benefit of banks and other monetary establishments.

Mbucho (2015) completed an exploration study on impact of credit the executives on the advance execution among microfinance establishments in Kenya. A graphic look into overview configuration was utilized or embraced. The investigation target populace was taken from 6 chose MFIs which were situated in Nairobi by 2014. The investigation inspected the credit officials of these chose small scale fund organizations utilizing a stratified arbitrary testing strategy. Essential information was utilized and this was gathered utilizing an organized poll after which a pilot review was directed in the MFIs in Kiambu County. After the information was gathered then it was examined utilizing both relapse

investigation and graphic insights. The introduction of the examination discoveries was readied utilizing tables and graphs. The investigation presumed that hazard the board significantly affected the advance execution to an extremely high degree. It was further apparent from the examination that most MFIs had perceived the requirement for powerful and proficient risks the executives rehearse and taken up the perfect measures to advance and realize it. Furthermore, some MFIs had created techniques on the most proficient method to check the impacts of dangers related with liquidity, credit, outside trade, financing costs and venture portfolio. The investigation discoveries likewise reasoned that the financing cost charged on the credit fundamentally influenced the advance execution at a high rate among the chose factors which were utilized in this examination.

Essendi (2013) completed an investigation on impact of credit chance administration on advances portfolio among the store taking Saccos in Kenya. The examination utilized an illustrative overview investigate plan. The populace comprised of all SACCOs authorized and directed by the administrative Authority, SASRA as at December 2012. As per the Authority there were 164 authorized stores taking Sacco. The examination took an example of 35 Saccos was chosen from the entire populace establishing 33% of the whole populace. The investigation test period was from 2009-2012. The investigation utilized essential information which was gathered utilizing both organized and semi-organized surveys with both open finished and shut finished inquiries. The investigation additionally utilized optional information which was gathered from the SASRA productions and the particular Sacco's credit approach records and their budget summaries. Quantitative information was dissected utilizing both Pearson connection investigation and various relapse models. The specialist inferred that most DT Saccos in Kenya had advance hazard relief approaches set up. These approaches were extremely vital in giving rules on the best way to deal with the different risks that these establishments went over in their credit loaning activities. Plan of the credit strategy was to a great extent did by the individuals from the establishments and the guideline with negligible inclusion of the SACCO workers and the directorate. The current SACCO credit arrangement was the essential record whereupon detailing of the new advances strategy was based. The individuals responsible for credit approach plan ought to consistently consider the patterns of borrowers and overhead costs related with the definition procedure. CAMEL rating framework assumed an incredible job in the appraisal of the adequacy of the organizations. The significant motivation behind why hazard distinguishing proof is significant in all DT Saccos is to empower them practice viable and proficient hazard the

board in the whole foundations hence advancing practices related with viable hazard the executives. Resource quality, capital ampleness, profit, liquidity and the board were found to have altogether positive coefficients in connection to credit distributions while resource quality was found to have a negative huge coefficient.

Wachira (2017) instigated an examination of the effect of credit risk administration practices on advance extension by profit-making banks in Nyeri County. The investigation utilized an descriptive exploratory structure. The investigation considered all the business banks that were working inside the area. An enumeration study was in this manner directed where in every one of the nine banks a populace of 85 respondents was focused on that established of credit administrators, credit officials and branch chiefs. The investigation utilized essential information that was gathered utilizing shut finished surveys that were self-managed by the respondents' utilizing the strategy for dropping and picking sometime in the not too distant future technique. The essential information gathered was a while later broke down by utilization of engaging measurements technique. The scientist presumed that hazard estimation and distinguishing proof had been demonstrated to be the most pivotal parts of the administration of credit and in this way extra exertion and time ought to be placed as a main priority to concentrate on setting up the degree where danger of borrowers could bring to the credit portfolio. Somewhat chiefs of these foundations ought to evaluate precisely the capacity of credit reimbursement. Controlling dangers has a great deal of noteworthiness also however institutional directors should find some kind of harmony between either getting a client, cost of the probability of default and lose of intrigue salary on the clients would have achieved.

Muturi (2016) conducted an investigation on effect of credit supervision practices on loan performance in DT MF banks in Kenya. The investigative structure adopted was a descriptive. The study target population constituted of 9 registered and licensed MFIs by the central bank were the staff or employees who included top, middle and lower level of the DT MFBs that were sampled. From the target population the study employed primary data which was gathered using designed questionnaires. In addition, the study additionally utilized secondary data which was obtained from annual checked monetary reports of micro finance institutions, Central Bank of Kenya final reports were all this collected data was revised for wholeness and constancy to undertake the statistical analysis. The collected primary data was analyzed using a statistical descriptive analysis of mean and standard deviation. Further

inferential statistics by use of multiple linear regression models was employed or used. The study therefore concluded that management of credit was one of the most crucial activities in any institution or organization and cannot be undermined by any economic enterprise engaged in credit practices irrespective of its nature of business. Comprehensive debt administration practice and activities should be a requirement for all pecuniary establishments' stability and continued liquidity and profitability. From the investigation's finding and study conclusions, the deposit taking microfinance institutions should always ensure that a very great extent of credit terms, collection policies, credit policies and credit standards should be adopted in these institutions.

Hassan and El-Ansary (2015) did an examination on the impact capital sufficiency proportion in the Egyptian business banks. The investigation embraced an elucidating research configuration further covering all the 35 enrolled and managed business banks for the period running 2004 – 2013. The specialist inspected the connection between the capital sufficiency proportion as the reliant variable and acquiring resources proportion, liquidity, benefit as the free factors, advance shortfall arrangement was the proportion of credit hazard, net intrigue development edge, firm size, advances to resources proportion and stores to resources proportion. Before the year's over 2008 the outcomes uncovered that firm size, gainfulness and resource quality were the most noteworthy factors of the investigation. Before the year's over 2009 the outcomes uncovered that liquidity, the board quality, resource quality, and credit dangers were the most critical factors of the examination that clarified the change of the capital ampleness proportion of the Egyptian business banks.

Gabriel and Gary (2016) did an investigation on the effect of the BASEL capital prerequisites on the exhibition of European bank. A few creators accepted that the size of the European banks may have been a significant determinant of their general execution. Moreover, greater banks may profit by the economies of scale, decreasing the operational expenses of preparing and assembling the fundamental data. Nonetheless, the investigation aftereffects of the relapse altogether show that the presentation was not affected at all by the size of the banks. While there was further no understanding in the writing on the ideal size of budgetary foundations, a specific number of research researchers found that past a generally low degree of benefits, it is not fascinating to arrive at a moderately bigger size in the market (Gropper, Ivey, and Rutherford, 2005).

Lotto (2016) instituted an investigation on productivity of capital sufficiency prerequisites in diminishing risk-taking practices of profit-making Tanzanian banks. From the examination's discoveries it was revealed that there existed a noteworthy significant association amid regulatory pressure and capital ampleness where this positive relationship shows that huge business banks in Tanzanian were moving toward the base set capital prerequisites edge and was slanted to improve their capital base so as to address the charges came about because of the inability to meet the lawful necessities of keeping least capital proportion. The investigation further uncovered that there existed a noteworthy and significant relationship in the midst of gainfulness and bank capital ampleness inferring that as the benefit of banks expanded, they regularly held more profit to raise the degrees of their capital sufficiency. Besides, it was presumed that improvement in banks productivity and liquidity causes them increment their capital proportions and keep them from punishments related with powerlessness to meet the set least capital prerequisites limits.

Barrios and Blanco, (2000) did an investigation on viability of bank capital ampleness prerequisites utilizing a hypothetical and observational methodology of every single Spanish saving bank. The fundamental target of the examination was to analyze how investment funds banks set their capital proportions to be exact the pace of value capital over their benefits. The investigation results found were that a higher change speed to the ideal capital proportion was seen in the market in Spain banks model than in the administrative one. Determinants of the ideal market capital proportion that is the market model and the administrative wanted capital proportion which is the administrative model were commonly critical and they all had signs concurred with those anticipated in the hypothetical model. Then again, produced information demonstrated that Spanish investment funds banks were influenced by guideline and would need to set a capital pad over the managed least limit. It was accordingly presumed that the administrative imperative was one of the most significant elements of capital enlargements in sparing banks yet not alone.

Poudel (2012) investigated different parameters relevant to credit chance administration and its impact on Napel banks budgetary execution. Parameters canvassed in his examination were cost per credit resources, capital sufficiency proportion and default rates. The investigation utilized auxiliary information that was gathered from the inspected money related reports of the 31 banks were the information for a long time from 2001 to 2011. This was finished by contrasting the productivity proportion with default rate, cost of per advance

resources and capital ampleness proportion which was exhibited in clear measurements. The information was examined utilizing connection and relapse models. The examination discoveries uncovered that all these set parameters inversy affected banks monetary execution. Perception of t-test showed that there was fundamentally negative connection between return on resources and free factors which were the default rate and capital sufficiency proportion. Be that as it may, the default rate was the most indicator of Napel banks money related execution. At long last poudel suggested that money related organizations, banks should plan and detail stringent procedures that won't just decrease the presentation of the banks to credit hazard however will improve its productivity and liquidity levels.

2.4. Critique of Existing Literature

A critical survey of past investigations uncovers that few theoretical and relevant study gaps existed in the investigations completed. For example, in the investigations completed by Thisika (2017) directed an investigation on the impact of credit hazard management on advance execution in business banks in Kenya. The exploration embraced an expressive research structure where the objective populace was 70 participants drawn from the nine business banks in Bungoma. The objective populace involved all the staff in the credit division of the business banks which included Co-usable Bank Limited, Kenya Commercial Bank, Barclays Bank, Equity Bank, Standard Chartered Bank, National Bank, Diamond Trust Bank, Bank of Africa and Krep Bank. A Census procedure was accordingly utilized with a rundown of all credit office staff at the branch level in the 10 considered business banks in Bungoma. Essential information was gathered utilizing an information assortment poll that had both open and shut finished inquiries. The information was in this manner examined both subjectively and quantitatively where topical examination was received for the subjective information. It was in this way presumed credit evaluation had a positive and solid relationship with non-performing advances. The exploration study in this way reasoned business banks ought to have set up composed and endorsed rules on the credit endorsement process. It was additionally settled in the investigation discoveries that the work of a certified credit official since its significant evaluating the credit value of the clients who acquire funds. Along these lines business bank staffs ought to be prepared sporadically to furnish them with applicable and essential abilities since this will go far in decreasing the non-performing credit levels. To this regard, there is an inclination that the analysts end and suggestion was not

adequate enough since intermittent preparing doesn't require securing of important abilities that guide to powerful credit hazard the executives in business banks.

Mwangi and Muturi, (2016) directed an examination of the impacts of credit chance administration on reimbursement execution of the advances of the Kenyan business banks. An unmistakable research configuration was embraced since it helped in depicting the ebb and flow condition of the issues of its exercises or tasks as it is as of now is at present. The number of inhabitants in the examination comprised all the forty-two (42) enrolled business banks working in Kenya where the investigation was led at their administrative centers which are altogether situated in the downtown area in Nairobi. The example populace of the investigation was taken from the 42 business banks through a purposive sampling. The objective populace for the investigation was the representatives working at the 42 business banks in Kenya along these lines an example of 54 respondents was drawn utilizing the picked testing system. The examination utilized essential information that was gathered utilizing surveys. Legitimacy and unwavering quality tests were directed through a pilot review by utilization of a technique by Cronbach Alpha. There after the investigation was done utilizing both subjective and quantitative methodologies and systems. The gathered information was hence examined utilizing the inferential and graphic measurements. Four study ends were understood that depended on the investigation destinations. Right off the bat, the associations credit arrangements had a noteworthy beneficial outcome on the reimbursement execution of advance were subsequently the genuine ramifications of this was progressively stringent credit approaches of the associations would have prompted guaranteeing that it's just the credit commendable clients who get advances consequently advances execution in to the extent reimbursement is concerned is kept up in an extraordinary and great position. The investigation discoveries vanquished with the discoveries of Burns et al (2006) who expressed that credit arrangements in associations assume basic jobs in the selection of people and organizations whose bank advance advances to hazard recognizable proof procedure had a constructive huge impact on the reimbursement execution of advances and thusly inferring that they ought to be adequately embraced doesn't require viable credit the executives practice in a monetary foundation and in this way this structures a premise of further research.

Gisemba (2010) likewise completed an examination on effect of credit chance administration rehearses on money related execution among the Saccos. The analyst inspected 41 Saccos and inferred that Saccos required stringent administration of credit hazard to keep it from flopping in its commitment and meeting its target, limit advance defaulters, money misfortune and guarantees the association performs better expanding the arrival on resources and helps the association in achieving most extreme monetary returns. The examination further reasoned that there was a positive noteworthy connection between credit hazard the executives rehearses and the money related execution of Saccos, delineating the connection between credit chance administration rehearses and monetary execution in associations. In this way, it is essential for all Saccos to have set up complete hazard the executives practices and detailing procedure to gauge, distinguish, oversee, screen, control and report dangers related with credit. Proficient and powerful credit chance the executives rehearses have been very basic in permitting the remarkable development in SACCOs.

Murigi (2018) directed an examination on layaway hazard the executives and credit execution in microfinance foundations or banks in Kenya. The investigation received an unmistakable research structure. The objective populace included 12 smaller scale money organizations considering an example size of 60 respondents made up of 5 respondents from every one of the 12 miniaturized scale fund banks who were gotten utilizing a purposive examining method. The investigation utilized essential information which was gathered utilizing surveys and after it was gathered, it was examined utilizing a SPSS rendition 21 where both inferential and elucidating measurements was led. From the discoveries, the examination found a positive and huge connection between the accompanying factors; credit hazard condition, credit evaluation process, credit organization, estimation and checking, inside power over credit chance and the advance execution in the MFBs. Besides, the senior administration in the smaller scale account banks ought to create stringent arrangements and strategies, set up most extreme credit limits, have a framework for checking the state of individual loaning and an autonomous inside control framework for directing progressing evaluation of the MFBs procedure of the board of credit hazard. The analyst ought to have received credit examination, checking, investigation and alleviation procedures instead of credit hazard condition, credit evaluation process, credit organization. Likewise, the analyst had no econometric model thus it was unrealistic to check the type of connection among needy and free factors.

2.5 Conceptual Framework

A conceptual framework is a succinct portrayal of the phenomena being investigated accompanied by the realistic or visual delineation of the significant variables of an investigation (Mugenda, 2008). Ravitch and Regan (2012) characterized a reasonable system is an explanatory instrument with a few varieties and settings. It is utilized to make theoretical qualifications and compose thoughts where a description of this framework contributes to an elaborate research in the following two ways; identifying research variables and still clarifies relationships among the variables. Linkage with the statement of the research problem, the conceptual framework sets out the stage for presentation of the specific research questions that drives the investigation being reported. From the analysis of the literature, the conceptual framework of the study was presented as shown in figure 2.1.

Independent Variables   **Moderating Variable**   **Dependent Variable**

Credit Risk   Firm Size   Loan Performance
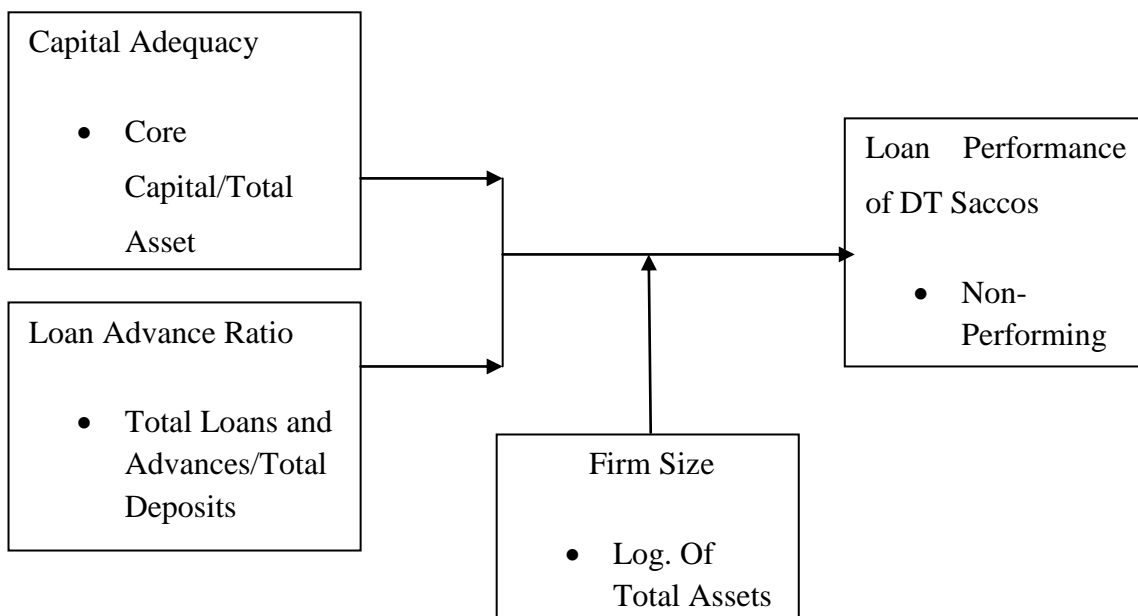
Figure 2.1: **Conceptual framework on influence of firm size on the relationship between credit risk and loan performance of deposit taking Saccos in Kenya**

2.6 Research Gaps

From the above review of pertinent investigative literary works, it was clearly noticed that exploration in the region of the connection between credit risks and credit performance of DTSs in Kenya has not been adequately addressed in a thorough methodology. The vast majority of the literature evaluated demonstrated that past investigators just focused using a loan hazard management practices and its impact on budgetary execution forgetting about the connection between credit hazard and credit execution. The present examination had a more extensive degree by tending to and covering extra significant factors of capital adequacy, credit advance proportion and a moderating variable which was firm size that were overlooked by past investigations. This consequently, made the examination progressively exhaustive. From study of important noting that it was discovered that there are no investigations explicit to Kenya on the connection between credit risk and loan execution of DTSs and they excluded directing factors. This examination in this manner planned to fill this appropriate hole in writing by considering the influence of firm size on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter entails the philosophy of the investigation, its design, target populace, data gathering, data gathering instruments, data collection procedure, data processing and analysis.

3.1 Research Philosophy

Research philosophy is the establishment of information on which fundamental methods of reasoning of any examination is based. The choice of a study philosophy in any examination decides the degree to which research configuration will be received. The two philosophical customs that guided this social science investigation were positivism and social constructionism. Positivism is a way of thinking that looks for genuine realities of social phenomena that are unsurprising, nonpartisan and goal with little respect for the subjectivity of people. The scientist simply created thoughts through acceptance and was a member spectator, and attempted to comprehend what was going on and explored little examples inside and out over a given span of time. An investigation by Saunders *et al.* 2007, the specialist embraced the metaphysics of objectivism depicting the position that social elements exist as a general rule to social on-screen characters worried about their reality. The examination mirrored the way of thinking of positivism which was a methodology that looks for realities or reasons for social, financial or business marvels, with only next to no respect to the emotional condition of the person. Considering the primary target of this exploration study, the sort of assessment, the degree of analyst contribution in the investigation, the timeframe over which information was gathered and the kind of examination embraced, the philosophical establishment managing this exploration work was a positivism inquire about way of thinking on the grounds that the in all regard the scientist was free based on what was being watched. It is typically contended that exploration approaches are constantly connected to various research ways of thinking led (Saunders et al., 2007). By receiving a positivism see, this examination concentrated significantly on hypothesis testing wherein hypothesis was first embraced as the structure for creating and testing theories. This accordingly stressed the deductive direction the investigation embraced.

3.2 Research Design

The investigator applied a descriptive research design. Time Series Cross Sectional (TSCS) data got utilized in examining the influence of the firm size on the relationship credit risk and loan performance of deposit taking Saccos in Kenya. The research design involved panel data estimation because the design allowed for individual specific variable therefore providing for heterogeneity that is normally related to individual DT Saccos. Panel design is an amalgamation of time series cross sectional observations and due to this it was considered one of the most effective designs in the study of causation, other than pure random experiment (Stimson, 1985). As stated by Lempert (1966) it was a par excellence research other than detecting causal relationships, it also offered a number of distinct merits. It gave data which was more informative, less collinearity amid variables, with a greater degree of variability, more efficiency and more degrees of freedom. To some extent, panel data minimizes the bias that can result from individual institutions being aggregated. Empirical analysis can also be enriched in a manner that may not be possible if either only cross-sectional data or time series data was applied (Ogboi and Unuafe, 2013). This design was used to describe, analyze and measure the influence of the firm size on the relationship between credit risk and loan performance of DTSs in Kenya.

3.3 Target Population

The target populace for the investigation was all the DTSs in Kenya licensed and regulated by SASRA. As at 31st December, 2017, there were 175 deposit taking Sacco societies permitted to carry out deposit-taking activities in Kenya for the fiscal year ending December 2017 (Sacco Supervision Report, 2017). A census was carried out targeting all the 175 DTSs regulated by SASRA as at December, 2017. A census technique considers inclusion of all the elements in the sampling frame into the study which eliminates any sampling bias. A census is considered in cases where taking smaller samples of the population would not be cost effective. The study used secondary data that was gathered from SASRA for all the SACCOs being studied thus a census was considered adequate and adopted without any additional costs.

3.4 Data Collection

The Secondary material got drawn from checked fiscal statement and reports submitted to the regulator by the deposit taking Saccos after they have been registered by the Commissioner for Co-operative Development. The data was collected to cover a period of 5-year ranging

from 2013 -2017. Panel data was collected because it would help to investigate the conduct of each deposit taking Sacco with time and crossways (Baltagi, 2005 & Gujarati, 2003).

The panel data estimation method was embraced in light of the fact that it deals with heterogeneity related to individual DT SACCOs by taking into consideration singular explicit impacts. Likewise, by consolidating time arrangement of cross-sectional perceptions the board information gave progressively instructive information with greater fluctuation, less collinearity among factors, more degrees of opportunity and more proficiency and adequacy. Board information additionally limited any predisposition that could have been because of if individual DT Saccos are totaled. It additionally enhanced the exact examination so that might not have been conceivable if either just time arrangement measurable information or cross-sectional factual information was utilized (Ogboi and Unuafe, 2013).

3.5 Data Collection Instrument

The researcher utilized secondary data which was taken from reviewed fiscal statements and reports submitted to SASRA by all the deposit taking Saccos after they have all been registered by the commissioner for Co-operative Development. The data was collected for a 5-year period ranging from 2013 - 2017. A secondary data gathering tool got employed in collecting the statistics (See Appendix I).

3.6 Data Collection Procedure

The investigator wrote to SASRA the regulator, to request for admittance for the yearly fiscal statements and reports for five years period ranging from 2013 to 2017. DT Sacco's supervisory departments availed the printed statements which the investigator utilized in extracting data employing the desk search methods. The gathered material was input into an MS Excel data gathering piece where it was cleaned up and saved for analysis.

Panel data was utilized in light of the fact that it helped study the conduct of each monetary organization, DT Sacco after some time and crosswise over space (Baltagi, 2005 and Gujarati, 2003). Polit and Beck (2010) likewise showed that auxiliary examination of existing information was proficient and conservative since information assortment is normally the most tedious and costly piece of any exploration work.

3.7 Data Processing and Analysis

This part examined the procedures that were utilized to break down information and test the factors. The information was sorted out and money related proportions figured utilizing Excel program so as to acquire the investigation factors. The panel data gathered was scrutinized quantitatively utilizing regression conditions, which were completed utilizing the measurable instrument STATA, form 13.

3.7.1 Measurement of Variables

The espoused loan performance was the dependent variable. Capital adequacy and loan advance ratio constituted the explanatory variables for the investigation. The moderating variable of the examination was firm size. This part gives subtleties of how every one of the examination factors was estimated and operationalized.

3.7.1.1 Measurement of Capital Adequacy

The ratio of Core Capital to Total Assets is a risk sensitive measure of capital that was used (Nasieku *et al.,* 2013). The ratio measured the amount of DT Sacco's capital adequacy in relation to the amount of its credit exposures or risk. The risk takes into account the relative riskiness of various types of credit exposures that the DT Saccos have, and incorporates the effect of off-statement of financial position contracts on credit risk. Therefore, the higher the ratios a Saccos has, the greater the level of unexpected losses it can absorb before becoming insolvent or having inadequate capital. The ratio was computed as;

$$Capital\ Adequacy = \frac{Core\ Capital}{Total\ Assets}$$

3.7.1.2 Measure of Loan Advance Ratio

Loan and Advance Ration (LAR) is a proportion between the Sacco's absolute credits and advances to add up to stores. On the off chance that the proportion is lower than one, the SACCO will depend alone stores to give credits to its individuals, with no requirement for outside obtaining. On the off chance that, then again, the proportion of advances and advances is more noteworthy than one, the Saccos will get more cash which it relined at higher financing costs, instead of depending altogether alone stores. Saccos may not be winning an ideal return if the proportion is excessively low. In the event that the proportion is excessively high, the Saccos probably won't have enough liquidity or money to cover any unanticipated financing necessities or monetary emergencies. The DTSs should utilize advance and advances to store

proportion. The proportion showed the capacity of Saccos' to withstand reserve withdrawals and eagerness of the Saccos to fulfill advance or credit need by diminishing their money resources. At the point when the Saccos are progressively fluid, they can decrease danger of any bankruptcy.

$$Loan\ Advance\ Ratio = \frac{Total\ loan\ and\ advances}{Total\ Deposits}$$

3.7.1.3 Measure of Loan Performance

Loan performance was measured using non-performing loans (NPLs). The efficiency of the loans in the deposit taking Saccos was assessed through application of NPLs, because it exposed that Saccos invest back their incomes to create upcoming revenues. The development of NPLs also depends on the capital bases of the DTSs and the Saccos' operational revenue margins. This measure gives a somewhat pessimistic picture of the loan performance (Serwa, 2013). An increase in the ratio has an implication of an increase in loans or dredit at risk of the non-performing loans in the Saccos.

$$Loan\ Performance = \frac{Total\ NPLs}{Gross\ Loans}$$

3.7.1.4 Measure of Firm Size

The size of the firm was quantified by the ordinary logarithm of the aggregate assets Smirlock (1985). It was the moderating variable used to ascertain the relationship between credit risk and loan performance of the DTSs in Kenya. Firm size was signified by natural logarithm of total asset.

$$Firm\ Size = Log(Total\ Assets)$$

3.7.2 Operationalization Table

Table 3. 1: Operationalization Table of Variables

S/NO	VARIABLE	OPERATIONAL DEFINATION	MEASUREMENT	HYPOTHESIZED DIRECTION
1	Capital Adequacy	According to Fatima (2014), it ensures the financial soundness of financial institutions in absorbing a reasonable amount of loss hence protects this institutions against excess leverage and insolvency.	Core Capital/Total Asset Core Capital/Total Deposits	Capital Adequacy has a positive influence on loan performance
2	Loan Advance Ratio	It's the measures financial institutions' liquidity as well as profitability of the institutions', calculated by dividing the total amount of loans, by total amount of deposits (Michael Taillard, 2014)	Total Loans and Advances/Total Deposits	Loan advance ratio has a positive influence on loan performance
3	Loan Performance	It's a subjective measure of how well a financial institution can use its assets from its primary mode of business operations and generate revenues or profits. (Thisaka, 2017).	Non-performing Loans/Total Loans and Advances	Loan performance has a negative influence
4	Firm Size	Its employees per establishment, employees per company, sales per firm, and value added per firm. (Business Dictionary, 2016).	Log. Of Total Assets	

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3.7.3 Model Specification and Diagnostic Tests

By utilizing Panel information, it was conceivable to incorporate time impacts just as control for singular heterogeneity, which was caught by firm explicit fixed or arbitrary impacts segments, that prompts one-sided results when ignored in cross-area or time arrangement estimations (Baltagi, 1995). To appraise the aftereffects of the impact of firm size on the relationship between the credit risk and loan performance of deposit taking Saccos in Kenya, the study fitted panel model regressions estimates. Panel data structures were multilevel with 2 levels of analysis (entity and time). Panel data model specification in this study was based on the existence of heterogeneity and whether existing heterogeneity is correlated to the model predictors. Model specification tests were undertaken to ascertain the degree of heterogeneity and to inform the appropriate model. A pooled model also referred to as the population averaged model assumes that that latent heterogeneity has been averaged out as individual effects are not persistent across entities and thus panel effects do not exist. A Lagrange-Multiplier Breusch-Pagan test was utilized in determining the specification amid a pooled model and a random effect model (Greene, 2010).

In the event of data exhibiting panel effects, A Haussmann test was undertaken to find specification between either random or fixed effects model. A random effect model is considered to have latent heterogeneity individual that persistent but are uncorrelated to the predictor variables and are thus ignorable Hajivassiliou (2011). In a fixed effect model instead, individual effects (latent heterogeneity) are assumed to be persistent across entities and also correlated to the predictors. The Haussmann test was thus used to assess this phenomenon and conclude on the appropriate model specification between fixed and random effect.

Model 1

The first objective was to determine whether capital adequacy influences the loan performance of the DTSs in Kenya. Non-performing Loans were regarded as a measure for credit execution and in this way, were utilized as the needy variable though capital sufficiency and advance development proportion was considered as autonomous factors. The investigation accepted that the free factors and the reliant variable have a general multiplicative Cobb Douglas utilitarian relationship appeared in condition 3.1.

L.P = f (C.A) (3.1)

Upon linearization and parametization the possible models were specified as

$$Y_{it} = \beta_0 + \beta_1 X_{it}^1 + \varepsilon_{it}\ldots\ldots \text{ Fixed effect model}$$ (3.2a)

or

$$Y_{it} = \beta_0 + \beta_1 X_{it}^1 + \mu_{it} + \varepsilon_{it}\ \ldots..\text{Random effect model}$$ (3.2b)

In which Y_{it} represents the loan performance of Sacco i at time t, β_0 stands for the model constant or intercept, β_1 stands for the coefficient of the predictor Capital Adequacy. X_{it}^1 stands for capital adequacy ratio of Saccos i at time t. μ_{it} It's the Sacco (entity) specific effect that was presumed to be normally dispersed with a persistent variance and ε_{it} was the idiosyncratic error term which was presumed to have a normal distribution.

Model 2

The second objective was to find out whether loan advance ratio influences the loan performance of the deposit taking Saccos in Kenya. The investigation presumed that the autonomous variables and the reliant variable had a general multiplicative Cobb Douglas functional relationship as shown in equations below

L.P = f (L.A.R) (3.3)

Upon linearization and parametization the possible models were specified as

$$Y_{it} = \beta_0 + \beta_1 X_{it}^2 + \varepsilon_{it}\ldots\ldots \text{ Fixed effect model}$$ (3.3a)

or

$$Y_{it} = \beta_0 + \beta_1 X_{it}^2 + \mu_{it} + \varepsilon_{it}\ \ldots..\text{Random effect model}$$ (3.3b)

In which Y_{it} represents the loan performance of Sacco i at time t, β_0 stands for the model constant or intercept, β_1 stands for the coefficient of the predictor loan advance ratio. X_{it}^1

stands for loan advance ratio of Saccos i at time t. μ_{it} It's the Sacco (entity) specific effect that is assumed to be normally distributed with a constant variance and ε_{it} is the idiosyncratic error term which was assumed to have a normal distribution.

Model 3

The third objective was to establish the influence of firm size on the relationship between the credit risk and loan performance of deposit taking Saccos in Kenya. The investigation utilized Keppel and Zedeck (1989) analysis procedure to test whether firm size influences the relationship between the credit risk and loan performance of deposit taking Saccos in Kenya. Keppel and Zedeck (1989) suggested that the perceived moderator have to be established as an explanatory variable and thereafter used to generate an interaction term as a cross-product between the perceived moderator and the other model predictors. A moderated hierarchical regression was carried out based on a joint (multiple) regression model. The hierarchical regression model was carried out in stages where a multiple regression model was first fitted including the 2 independent predictors in a joint effect model. The model structure was then adjusted in stage 2 to include the moderating variable firm size and in stage 2 the interaction terms between the predictors and the moderator also added to the model and the overall effect of each structural change in the model assessed. The influence of firm size on the relationship between credit risks and loan performance was tested as an attribute to a significant change (improvement) to the model due to addition of the interaction terms in the third model. The panel effect models based on the third model including the interaction terms is given by the equation below;

$$Y_{it} = \beta_0 + \beta_1 X_{it}^1 + \beta_2 X_{it}^2 + \beta_M Z_{it} + \beta_{1M} Z_{it} * X_{it}^1 + \beta_{2M} Z_{it} * X_{it}^1 + \varepsilon_{it} \qquad (3.3a)$$

Or

$$Y_{it} = \beta_0 + \beta_1 X_{it}^1 + \beta_2 X_{it}^2 + \beta_M Z_{it} + \beta_{1M} Z_{it} * X_{it}^1 + \beta_{2M} Z_{it} * X_{it}^1 + \mu_{it} + \varepsilon_{it} \qquad (3.3b)$$

Where:

Y_{it} = Loan Performance

β_0 = Constant term

β_j = Coefficients of the explanatory variables and interactive terms

X_{it}^K = Credit risk variables

$Z_{it} * X_{it}^1$ = interaction terms between firm size and credit risks

ε_{it} = Error term (the time-varying disturbance term will be serially uncorrelated with mean zero and constant variance)

3.7.4 Diagnostic Test

Before the administration of multiple regression analysis a number of essential assumptions will be checked so as to avoid type I and type II errors that occur during the interpretation stages of the model (Cohen, West & Aiken, 2013). These assumptions include testing for homoscedasticity, non-autocorrelation, multivariate normality, non-multicollinearity and cross-sectional independence (Cohen *et al.,* 2013; Mason & Perreault Jr, 1991). Upon violation of the homoscedasticity, non-serial correlation and or cross-sectional independence, a generalized least squares model was considered which incorporated the autocorrelation coefficient and allowed for robust heteroscedastic residuals with cross-sectional dependence. In case of violation of the normality assumption on the other hand, a bootstrap is carried out as a resampling technique to cater for the violation.

3.7.4.1 Testing for Normality

The trial of significance, for example, the standard errors and t-tests are secured on the supposition that the mistake term is ordinarily dispersed and has steady difference. In this manner, the investigation needed to set up from the earlier that the single direction mistake segment models were in the board informational indexes and were ordinarily dispersed and had steady fluctuation. The expansion of the Bera-Jarque typicality test by Galvao, Montes-Rojas, Sosa-Escudero and Wang (2013) made the ordinariness trial of the lingering a standard test that can be performed preceding the estimation of the model or considerably after the estimation of the model. The test has an invalid theory that the segments of the blunder term are regularly conveyed. Dismissal of the invalid theory infers that t tests and standard mistakes from the models can't be utilized to test the essentialness of coefficients in the models.

3.7.4.2 Testing for Heteroscedasticity

Heteroscedasticity refers to disturbances of regression which have non constant variances across observations (Greene, 2008). Heteroscedasticity leads to findings being inefficient as it arises in multiple applications, in both time series and cross- data (Baltagi, 2005). This study applied the Lagrange-Multiplier test for panel heteroscedasticity. The null hypothesis stated that the model residuals exhibit panel homoscedasticity. Therefore at 95% of level of confidence, the null hypothesis is rejected if the Chi-square statistic has a p-value that is less than 0.05 to imply existence of panel heteroscedasticity. Stock and Watson (2003) suggested two ways of dealing with heteroscedasticity, by use of weighted least squares or heteroscedasticity-robust standard errors. This study applied heteroscedasticity-robust standard errors, so as to solve the heteroscedasticity problem if found present.

3.7.4.3 Testing for Autocorrelation

Across periods time-series data regularly displays serial correlation or autocorrelation of disturbances (Greene, 2008). The presence of panel autocorrelation is problematic to panel data models that are linear. This is because it makes consistent the estimated regression coefficients however they are left inefficient. Moreover, the presence of serial correlation makes standard errors biased (Drukker, 2003; Baltagi, 2005). Breusch-Godfrey/Wooldridge test for serial correlation was adopted. The test involved the generation of f-statistic with a p-value which was used as the rejection criteria. A p-value which is greater than 0.05 implied that there was a non-serial correlation.

3.7.4.4 Testing for Multicollinearity

Kumari (2008) defines multicollinearity as the presence of a linear relationship among the independent variables of the study. Multicollinearity can lead to a forecasting error that is large and increase the difficulty in assessing the relative significance of variables independently in the model. This study applied both the tolerance test and its reciprocal also known as Variance Inflation Factor (VIF) so as to test for multicollinearity. The tolerance statistics values that are less than 0.10 (1/vif < 0.10) or Variance Inflation Factor greater than 10 (vif> 10) will indicate a multicollinearity problem (Oscar, 2007). VIF shows the magnitude of inflation of the variance of the coefficient estimate as a result of multicollinearity effect.

3.7.4.5 Testing for Cross Sectional Dependence

Panel information models likewise presume cross-sectional freedom of the model residuals. As indicated by Greene (2010), almost certainly, the more significant issue for the proper estimation of the asymptotic covariance lattice is the connection crosswise over perceptions, not heteroscedasticity. The Pesaran Friedman test for cross-sectional reliance was conveyed where a Z-statistic was created and a p-value under 0.05 inferring nearness of cross-sectional connection of the residuals.

3.8 Reliability and Validity Tests

The investigator gathered secondary info utilizing a data collection sheet to measure the independent and dependent variables of the study. Considering the secondary data used a pilot study and tests for reliability and validity was not necessary as done for primary data. Validity and reliability of secondary data depends on the credibility of the source of the information collected and is referred to as external validity (Dale et al., 1988; Glaser, 1962; Smith, 2008). Since someone else already tested for reliability and validity and collected the data, the researcher does not have to devote to the processes of primary data collection. Concerns should however be made to ensure that the sources of secondary data being used are credible. Secondary data used in this study was collected and kept by SASRA a regulatory authority whose data was considered to exhibit adequate external validity and credibility considering the reasons for its establishment within the Kenyan administration's reform process in the monetary sector.

3.9 Ethical Consideration

The main ethical concern being privacy, confidentiality, researcher responsibility and anonymity, the researcher wrote a letter to the SASRA seeking for permission to access the secondary data. After receiving a positive feedback, the researcher took time to explain to the regulator the objectives of the study and that the purpose of it was purely for academic. The researcher thus observed impartiality throughout the period of study with most respect of the volume data given.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter entails the description of the study findings and a discussion of the results. This includes describing the processing and analysis of the gathered data and how inferences were made from the analysis to draw conclusions on the objectives of the investigation.

4.2 Response Rate

The investigation sought to carry out a census by collecting data from all the 175 DTSs in Kenya regulated by SASRA as at 2017. This investigation utilized secondary data that was drawn from reviewed financial statement submitted to SASRA by the deposit taking SACCOs after they have been registered by the Commissioner for Co-operative Development. The secondary data obtained from SASRA was from 135 DT SACCOs yielding a response rate of 77.143% response rate considering the targeted 175 Saccos. This rate of 77.143% was considered adequate basing on recommendations by Babbie (1990) proposed a response rate of 50% as adequate and Bailey (1987) who set the adequacy threshold to 75%.

Table 4. 1: Response Rate

DT Saccos	Population	Response	Rate
Total	175	135	77.143%

4.2.1 Missing Data

The data cases collected from SASRA were assessment for completeness of the considering both the time series and cross-sectional levels of the data. The assessment involved looking for missing information, reporting the magnitude of missing information and dealing the missing information among the variables across the entities over the 5 year period. As shown in figure 4.1, there were no elements of missing information on the raw data variables collected implying that information was gotten from all the 6 variables. All the 675 cases considering the 135 entities over 5 years had information resulting to 100% complete information from all the 4,050 required responses for 6 variables in all the 675 cases.
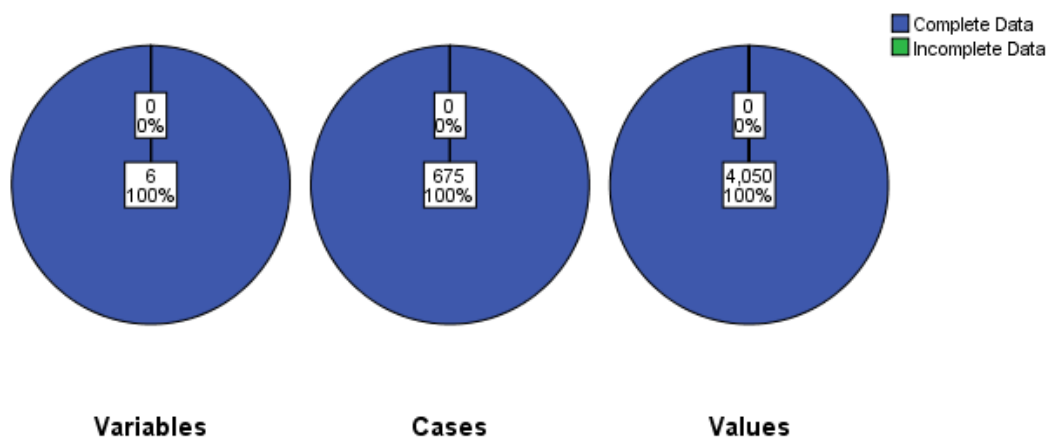
Figure 4. 1: Missing data Summary

4.3 Descriptive Analysis of Study Variables

The secondary data collected were on indicators measurements of the variables. Summary statistics (means over the years) of all the indicators; Core Capital, Total Assets, Total Loans, Total Deposits and Non-Performing loans as shown in table 4.2. Both the mean core capital and mean total assets were found to have some increasing trends over time. The mean core capital in the industry in year 2013 was 264 million which increased over the years to 601 million in the year 2017. The total assets also increased from 179 million in 2013 to 374 million in 2017. The results generally tend to show growth in the industry in general as the industry had increasing mean growth which tended to more homogeneous with time implying that all the entities seemed to have growth with none left behind.

Total loans and total deposits for the entities were noted to increase over time. The mean total loans issued in the industry in year 2013 were 1.44 billion which was seen to be on an increasing trend over the years to 5.02 billion in the year 2017. The total deposits also increased from 1.28 billion in 2013 to 2.85 billion in 2017. The annual average non-performing loans for the industry were noted to also have an increasing trend over time with the total loans and all the indicators assessed earlier. The overall mean non-performing loans in 2013 amounted to 65 million Kenya shillings which increased annually to 128 million Kenya shilling in 2017.

Table 4. 2: Core Capital and Total Assets

Year	Obs	Core Capital	Total Assets	Total Loans	Total Deposits	Non-Performing loans
2013	135	264,000,000	1,790,000,000	1,440,000,000	1,280,000,000	65,100,000
2014	135	329,000,000	2,030,000,000	2,420,000,000	1,520,000,000	74,600,000
2015	135	379,000,000	2,240,000,000	3,050,000,000	1,830,000,000	69,200,000
2016	135	558,000,000	3,690,000,000	4,760,000,000	2,790,000,000	129,000,000
2017	135	601,000,000	3,740,000,000	5,020,000,000	2,850,000,000	128,000,000

Table 4.2 indicates the overall summary data for the study variables. The data collected for the indicators were used to calculate the study variables based on formulas suggested from theoretical and empirical studies. The proportion of core capital to aggregate assets was used as a risk sensitive measure of capital was used as the measure of capital adequacy. The overall mean capital adequacy ratio was found to be 0.261 with a standard deviation of 0.303. This mean ratio being less than 1 implies that on average, the core capitals for the DT SACCOs are less than their total assets. Loan and advance ratio (LAR) was calculated as a ratio of the Sacco's total loans and advances to the total deposits. Loan performance was the dependent variable of the investigation that was also computed for each entity from the total non-performing loans and the aggregate advances. Loan advance ratio had a mean ratio with a mean of 1.563 and a standard deviation of 1.059. The average loan advance ratio was greater than one implying that on average, the DT SACCOs tend to give loans in total amount to more than the deposits collected.

The measure of loan performance was taken as a ratio of non-performing advances to aggregate loans. The efficiency of the loans in the DTSs was assessed by employing NPLs, because it indicates that DT SACCOs invest back their earnings to make future income. The ratio was calculated by dividing the NPLs by the total loans. This ratio of performance calculated considering the NPLs as a numerator however tend to have pessimistic (reverse) implication of performance. The higher this ratio is implies that the firm is faced with a challenge of more non-performing loans in consideration with the aggregate loans with is an implication of poor performance. If low, the ratio indicates that the firm has fewer non-performing loans in relation to the total loans thus an implication of goo performance. The mean loan performance ratio was found to be 0.127 with a standard deviation of 0.659. Firm size was used in the study as a moderating variable of the relationship amid the independent variables and loan performance. The data collected on aggregate assets was utilized as the quantifier of firm size after normalizing to scale considering the ratio scales of the dependent

and independent variables of the investigation. This was achieved by generating the natural logarithms of the total assets. Firm size was found to have a mean of 21.09 with a standard deviation of 1.26. All the variables except firm size tend to have skewness statistics greater than 0 and kurtoses that are greater than 3. This gave a possible indication that these variables do not follow a normal distribution thus models fitted may violate the assumptions of normality. A normal distribution is characterized by a skewness of 0 and a kurtosis of 3.

Table 4. 3: Summary Statistics for all Variables

	Capital adequacy	Loan advance ratio	Loan performance	Firm size (Log assets)
Mean	0.261	1.563	0.127	21.09
Std dev.	0.303	1.059	0.659	1.26
Skewness	5.049	5.485	17.896	-0.51
Kurtosis	43.122	53.608	384.883	2.52
Minimum	-0.392	0.163	0.000	17.21
Maximum	3.875	14.861	14.93	24.12

Table 4.3 shows a summary statistics table for the study variables considering the panel structure of the data by decomposing the measure of variation (standard deviation) into components reflecting variation within entities (over time) and that between entities (cross-sectional). The overall mean ratio of capital adequacy was found to be 0.261 across all observations. The overall standard deviation was found to be 0.302 which shows the dispersion/ variation of the capital adequacy ratio. It was also noted that the standard deviation of core capital within groups was larger than that between groups. This shows that the industry is less heterogeneous across the entities as there are more changes in the capital adequacy over time (within groups) than across the industry (between groups).

The measure of loan advance ratio was calculated by dividing the total loans issued by the total assets. As shown, the overall loan advance ratio was found to be 1.563. The standard deviation of the loan advance ratio was found to be 1.059. This variation when decomposed to the components of the panel data levels was found to depict higher variation within groups (over time within the entities) than between groups (cross-sectional).

The overall mean loan performance ratio of 0.127 had a standard deviation of 0.659. It was also noted that the standard deviation of loan performance within groups was larger than that between groups. This shows that the industry is less heterogeneous across the entities compared to the changes over time. The overall mean of the firm size measure was 21.094

with a standard deviation of 1.258. The variation within the entities is also seen to be slightly greater than the cross-sectional variation between the entities as was the case with the other variables.

Table 4. 4 Capital Adequacy Summary Statistics

		Mean	Std. Dev.	Min	Max	Observations		
Capital adequacy	overall	0.261	0.303	-0.392	3.875	N	=	675
	between		0.159	0.086	0.989	n	=	135
	within		0.258	-0.604	3.147	T	=	5
Loan advance ratio	overall	1.563	1.059	0.163	14.861	N	=	675
	between		0.652	0.827	6.190	n	=	135
	within		0.836	-3.152	10.234	T	=	5
Loan performance	overall	0.127	0.659	0.000	14.928	N	=	675
	between		0.352	0.005	3.535	n	=	135
	within		0.557	-3.380	11.520	T	=	5
Firm size (Log assets)	overall	21.094	1.258	17.214	24.120	N	=	675
	between		0.821	19.008	23.245	n	=	135
	within		0.955	19.300	23.843	T	=	5

Figure 4.2 shows a spaghetti/ profile plot of loan performance as the panel variable with 2 levels of analysis. Each line plot represents the performance of one of the 135 DT SACCOs over a profile of time periods. The figure depicts the trends showing high heterogeneity across the DT SACCOs in the earlier years 2013 and 2014 which had a lot of varying loan performance ratio across the entities. Over time, this cross-entity heterogeneity reduces to a more homogeneous industry in the years 2016 and 2017.
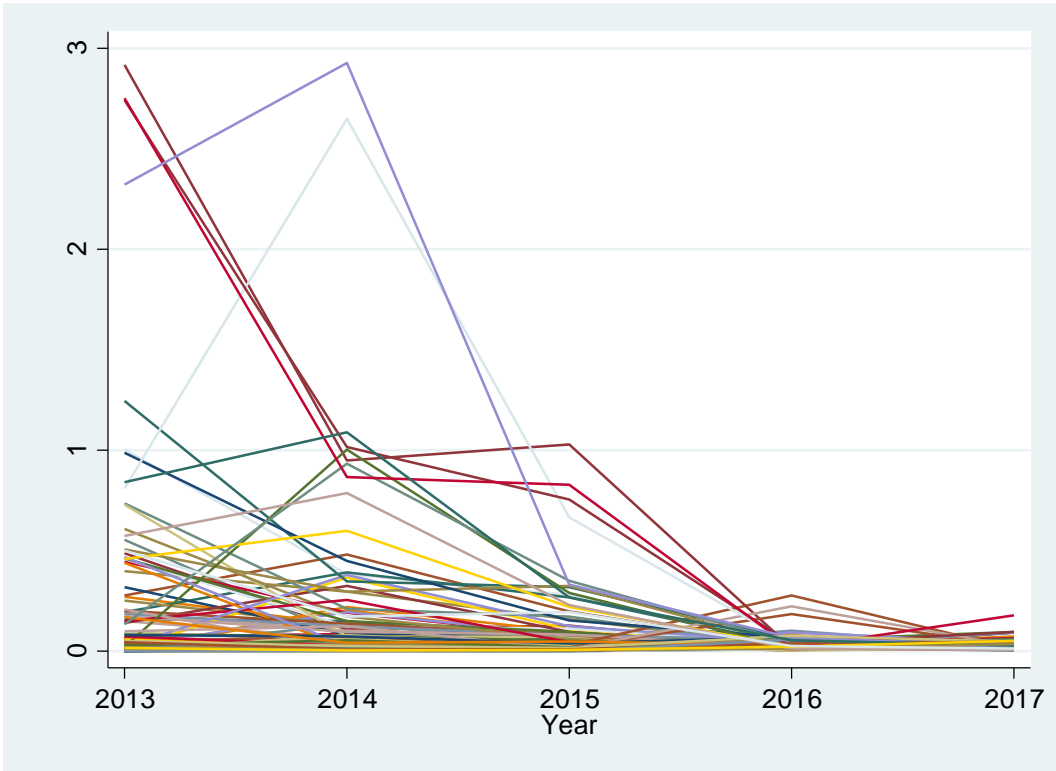
Figure 4. 2: Profile plot of Loan performance ratio over time

The trend is also confirmed by the confidence interval Figure 4.3 shows a spaghetti/ profile plot of loan performance as the panel variable with 2 levels of analysis. The graph shows the average annual loan performance ratios for each year with a confidence interval plot showing the level of variance performance at 95% confidence. The results show a reduction in the ratio with time and also a reduction in the confidence interval with time. This generally shows that with time, the industry averagely had a commonality in loan operations that yielded in the long run also yielded a general reduction in the loan performance ratio for the better as the ratio of non-performing loans to the total loans issued was on the decrease.
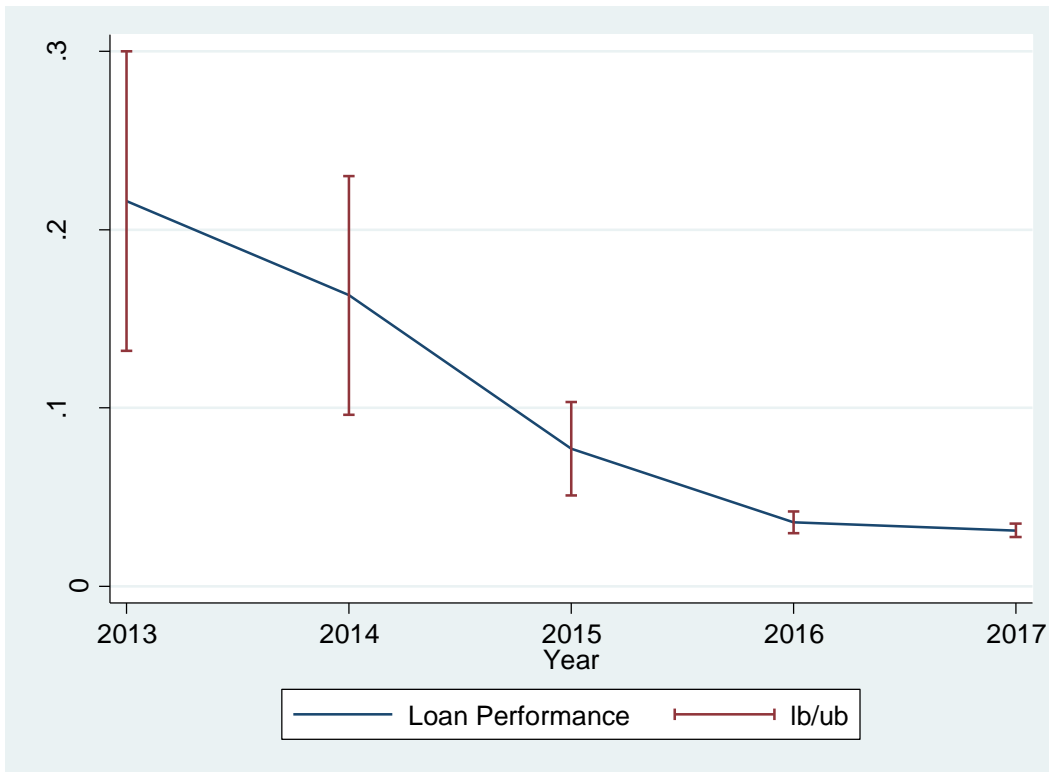
Figure 4. 3: Summary panel graph of loan performance with CI plots

4.4 Statistical Modelling and Hypothesis Testing

In order to draw conclusions on the study objectives by testing the hypotheses, the researcher fitted regression models from the data collected. Considering the panel structure of the data collected, the models fitted were based on panel data model specifications as presented in this section. Panel data such the dataset used in this study has a structure with groups of time series data in each of the entities. The data was found to exhibit a strong balanced panel characteristic as all entities had equal number of 5 time periods (years). Bivariate models were fitted which considering each independent variable and the dependent variable followed by a joint effect model which assessed the joint effect of capital adequacy and loan advance ratio on loan performance.

4.4.1 Test for Panel Stationarity

Panel data being longitudinal with a time level requires a test for stationarity before regression models are fitted. Stationarity is considered for data with a time series component as a stochastic procedure whose unrestricted joint prospect dispersal does not vary over time. In time series data, stationarity is portrayed by fitting and assessing autocorrelation function curves and partial autocorrelation function curves and tested with statistical significance

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using the Augmented Dickey Fuller (ADF) test. Panel data being groups of time series data are tested using techniques that considers and assesses stationarity across all the time series panels. This study used the Hadri Lagrange multiplier (Hadri LM) stationarity test to assess the stationarity of the dataset. This test investigates the null hypothesis that all panels exhibit stationarity which is rejected if the p-value of the Hadri LM statistic is less than 0.05. As shown in table 4.5, the p-values of the statistic are all greater than 0.05 thus the investigator failed to reject the hypothesis of panel stationarity and concluded that the panel dataset exhibited panel stationarity.

Table 4. 5: Unit Root Test for Panel stationarity

Hadri LM test for stationarity		
Ho: All panels are stationary	Number of panels = 135	
Ha: Some panels contain unit roots	Avg. number of periods = 5	
	Statistic	**p-value**
Capital_Adequacy	-4.1828	1.0000
Loan_advance_ratio	1.1774	0.1193
Loan_Performance	1.263	0.1033

4.4.2 Bivariate Analysis of Capital Adequacy Ratio and Loan Performance

The investigation aimed to ascertain the influence of capital adequacy on the loan performance of deposit taking SACCOs in Kenya. A bivariate regression was fitted with capital adequacy as the predictor variable to explore the direct influence. Considering the panel data collected, a test of model specification was undertaken and the outcomes presented in table 4.6. The outcomes of the Haussmann test chi-square statistic was found to have a p-value of 0.000 which is smaller than 0.05 favoring the fixed effect model to the random effect model for this one predictor model.

Table 4. 6: Bivariate Model Haussmann Specification; Capital Adequacy as predictor

	(b) **fixed**	**(B)** **random**	**(b-B)** **diff**	**sqrt(diag(V_b-V_B)) S.E.**	**Chi2(1)**	**Prob>chi2**
Capital_adequacy	-0.240	0.095	-0.335	0.039	72.59	0.000

The fixed effect model results for the bivariate model on the effect of capital adequacy on loan performance are as shown in table 4.7. The results are based on 675 observations from 135 entities. The R-square statistics show that the variation explained by capital adequacy within entities due to variations over time only constitutes of 1.23% of variance in loan performance. However due the cross entity differences, up to 26.96% of the variation in loan

performance is explained by capital adequacy. The Anova F-statistic has a p-value of 0.0098 which is less than 0.05 implying a general significance of the fixed effect model. The Coefficient of Capital adequacy on the model was also found to be a significant estimate of -0.240 with a p-value of 0.01 which is less than 0.05 to imply significance at level 5%. The test of the fixed entity effect shown by the footer F-statistic with a p-value of 0.000 which is also less than 0.05 indicates the existence of significant fixed entity effect.

Table 4. 7: Bivariate Model; Capital Adequacy as predictor

Fixed-effects (within) regression					Group variable: entity code	
	R-square					
within	between	Overall	F(1,539)	Prob > F	corr(u_i, Xb)	
0.012	0.270	0.004	6.730	0.010	-0.310	

Loan performance	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
capital_adequacy	-0.240	0.092	-2.590	0.010	-0.421	-0.058
_cons	0.190	0.034	5.580	0.000	0.123	0.256
				F test that all u_i=0:		
sigma_u		0.373		F(134, 539)		1.64
sigma_e		0.619		Prob > F		0.0001
rho		0.266	(fraction of variance due to u_i)			

The overall implication of the results of this bivariate fixed effect model was that capital adequacy had a momentous direct consequence on loan performance across entities. The equation generated from the model is given below;

$$\hat{Y}_{it} = 0.190 - 0.240X_{it}$$

The influence was negative to mean that snowballing capital sufficiency ratio by a unit would lead to a decrease in the loan performance ratio by 0.240. However, the measure of loan performance being on the reverse with a numerator of non-performance of loans, a further implication was that a cross entity increase in capital adequacy would directly lead to a decline in the ratio of non-performance of loans to the aggregate loans issued.

4.4.3 Bivariate Analysis of Loan Advance Ratio and Loan Performance

The study also aimed to determine the impact of Loan advance ratio on the loan performance of DTSs in Kenya. A bivariate regression was therefore fitted with Loan advance ratio as the predictor variable to explore the direct influence. A model specification test was conducted

and the outcomes presented in table 4.8. The results of the Haussmann test chi-square statistic was found to have a p-value of 0.0638 which was larger than 0.05 favouring the random effect model to the random effect model for this one predictor model.

Table 4. 8: Bivariate Model Haussmann Specification; Loan Advance Ratio as predictor

	(b) fixed	(B) random	(b-B) diff	sqrt(diag(V_b-V_B)) S.E.	Chi2(1)	Prob>chi2
Loan advance ratio	0.118	0.091	0.026	0.015	3.32	0.0683

The random effect model results for the bivariate model on the effect of Loan advance ratio on loan performance are as shown in table 4.9. The R-square statistics show that from the variance component within the SACCOs, up to 3.7% of the disparity in loan performance is explained by Loan advance ratio. The disparity explained by loan advance ratio due to cross entity differences explains only 0.1% of the variance in loan performance. The Wald chi-square statistic had a p-value of 0.000 which was smaller than 0.05 implying a general significance of the random effect model. The Coefficient of Loan advance ratio on the model was also found to be a significant estimate of 0.091 with a p-value of 0.044 that is smaller than 0.05.

Table 4. 9: Bivariate Model; Loan Advance Ratio as predictor

Random-effects					Group variable: entity code	
	R-square					
within	between	Overall	F(1,539)	Prob > F	corr(u_i, Xb)	
0.031	0.001	0.017	14.17	0.000	-0.2445	

Loan performance	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
loan_advance_ratio	0.091	0.024	3.760	0.000	0.044	0.139
_cons	-0.016	0.049	-0.320	0.747	-0.111	0.080
sigma_u	0.223					
sigma_e	0.613					
rho	0.116	(fraction of variance due to u_i)				

The constant term for this model was found to be irrelevant as shown by the p-value which was bigger than 0.05 implying a linear equation through the origin. The general implication of the results of this bivariate fixed effect model was that Loan advance ratio has a significant

direct effect on loan performance across entities. The equation generated from the model is given below;

$$\hat{Y}_{it} = 0.091X_{it}$$

The influence was positive to imply that increasing Loan advance ratio by a unit could result in an upsurge in the loan performance ratio by 0.091. Increasing the loan advance ratio by either increasing the total loans or reducing the deposits taken could result in an upsurge in the ratio of non-performance of loans to the aggregate loans issued. The findings were consistent with a study carried out by Gweyi, Olweny and Oloo (2018).

4.4.4 Joint Effect of Credit Risks on Loan Performance

The joint effect model of credit risks was fitted to assess the combine upshot of both capital sufficiency and loan advance ratio on loan performance jointly. For model specification, the Lagrange Multiplier (LM-BP) confirmed existence of panel effects while the Haussmann test favoured the fixed effect model.

The Lagrange Multiplier, Breusch-Pagan (LM-BP) test was for model specification to guide on the choice between the random effect model and the pooled model. The random effect model in this context implies existence of panel effects while the pooled model implies that there are no panel effects that population averaging would yield reliable results without considering the multi-level aspect of the panel data. The P-value of the LM-BP chi-square statistic was less than 0.05 implying that the test favours a random effect model and a significant existence of panel effects.

Table 4. 10: LM-BP Model Specification Test; Joint Effect Model

Var	sd	sd = sqrt (Var)	Test: Var(u) = 0		
Loan performance	0.434	0.659	chibar2(01)	=	13.28
e	0.371	0.609	Prob > chibar2	=	0.000
u	0.017	0.130			

Further to the LM-BP test, the investigation conducted a Haussmann test to guide on the choice between the random effect and a fixed effect model. The Haussmann test results as shown in table 4.10 favors the fixed effect for the joint model. The test chi-square statistic was found to have a p-value of 0.000 which is small than 0.05 favoring the fixed effect model to the random effect model for this one predictor model. The fixed effect model was thus

taken and presented as the appropriate specification of the joint influence of credit risks on loan performance.

Table 4. 11: Haussman Specification Test for the Joint Effect Model

	(b) fixed	(B) random	(b-B) diff	sqrt(diag(V_b-V_B)) S.E.	Chi2(1)	Prob>chi2
capital_adequacy	-0.266	0.056	-0.322	0.036		
loan_advance_ratio	0.123	0.083	0.040	0.014	90.55	0.000

The results of the joint fixed effect model are shown table 4.11. The overall R-square was found to be 0.184 while the R-squares within entities and that between entities were 0.065 and 0.163 respectively. This decomposed R-square show that on 6.5% of the variation in loan performance was clarified by variation of the predictors within entities due to changes over time while the variation in the model predictors due to differences across entities explain up to 16.63% of the variation in loan performance. The ANOVA F-statistic had a p-value of 0.000 which was less than 0.05 implying that the fixed effect model was generally significant and at least one of the model parameters is not equal to zero.

Table 4. 12: Joint Effect of Credit Risks on Loan Performance

Fixed-effects (within) regression					**Group variable: entity code**	
	R-square					
within	**between**	**Overall**	**F(1,539)**	**Prob > F**	**corr(u_i, Xb)**	
0.065	0.163	0.184	13.07	0.000	-0.2445	

Loan performance	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf. Interval]**	
capital_adequacy	-0.266	0.091	-2.920	0.004	-0.446	-0.087
loan_advance_ratio	0.123	0.028	4.380	0.000	0.068	0.178
_cons	0.004	0.054	0.070	0.941	-0.102	0.110

				F test that all u_i=0:	
sigma_u	0.380			F(134, 538)	1.75
sigma_e	0.609			Prob > F	0.0001
rho	0.280	(fraction of variance due to u_i)			

The coefficient estimates of the predictors; capital adequacy and loan advance ratio were both found to be significant as shown by the t-tests that indicate p-value of 0.004 and 0.000 for the variables respectively. Both p-values being less than 0.05 implies significant coefficient estimates for both capital adequacy and loan advance ratio.

4.4.4.1 Model Diagnostics

The model fitted was diagnosed for model assumptions. Like other linear regression models, the fixed effect model for panel data is also based on the classical assumptions of model estimation. The study thus carried out diagnostic tests on the joint effect model fitted to justify its use for hypothesis testing. The assumptions of normality, non-serial correlation, cross-sectional dependence and homoscedasticity of the model residuals and that of multicollinearity of the predictors were carried out and results presented in table 4.13.

On serial correlation, the study used the Wooldridge test. The results showed that the assumption of non-serial correlation of the residuals was not violated as signified by the F-statistic from the test which had a p-value greater than 0.05. Another Assumption that was not violated was that of non-multicollinearity of the model predictors which was based on the variance inflation factors (VIF) the VIF statistics for both predictors and the overall VIF were all less than 2 implying non-multicollinearity.

The assumptions of panel homoscedasticity, normality and that to cross-sectional dependence were all less violated. The chi-square statistic of the LM test for panel heteroscedasticity had a p-value of 0.000 which is less than 0.05 implying heteroscedastic residuals thus a violation of the panel homoscedasticity assumption. Normality was assessed based on the Bera-Jarque (JB) test for both the overall residuals (e) and the panel level residuals (u). Both the e and the u components of the residuals were found to violate the assumption of normality as shown by the JB chi-square statistics for both components that were all less than 0.05. The assumption of non-cross-sectional dependence was assessed using the Pesaran-Friedman test which also showed a violation of the assumption as depicted by the Pesaran Z-statistic that has a p-value less than 0.05.

Table 4. 13: Summary of Regression Assumptions Diagnostic Tests

Test	Assumption/ Purpose	Test statistic	P-value	Conclusion
Breusch-Godfrey/Wooldridge	Non-Serial correlation	$F(1, 134) = 0.226$	0.6351	Assumption not violated
Lagrange Multiplier (LM)	Panel Homoscedasticity	$Chi2(135) = 2.4e+08$	0.000	Assumption violated
Bera-Jarque (JB)	Normality on e	$chi2(2) = 6.11$	0.047	Assumption violated
Bera-Jarque (JB)	Normality on u	$chi2(2) = 1.6e+10$	0.000	Assumption violated
Pesaran Friedman test	Non Cross-sectional dependence	Pesaran's Z $= 19.157$	0.000	Assumption violated
Multicollinearity	Non multicollinearity	Mean VIF $= 1.01$		Assumption not violated

4.4.4.2 Generalized Least Square Joint Effect Model

Due to the violation of some of the assumptions, the fixed effect model fitted was not deemed adequate for testing study hypotheses. A generalized least squares (GLS) model was fitted which allowed for robust heteroscedastic residuals and cross-sectional dependence. On fitting the GLS model, bootstrapping was also carried out due to the violation of the normality assumption. The assumption surrounding serial correlation was not violated thus no autocorrelation lags were fitted and both predictors were retained without omission as they did not exhibit multicollinearity.

The results of the GLS model fitted were presented in table 4.14. The model was found to be generally significant as shown by the Wald Chi-square statistic of 14.86 with a p-value of 0.001. Unlike OLS models, GLS model are based on maximum likelihood. The R-squared statistic generated from the GLS sums of squares is not necessarily bounded between zero and one and thus may not truly reflect the percentage of the total variation in the dependent variable that is accounted for by the model. The analysis however included computation of Pseudo R-squares and Pseudo adjusted R-squares using on McFadden's Pseudo R-square formula which is based on the log likelihood statistics. McFadden's Pseudo R-square was adopted as the log likelihood statistics used in the formula also form the basis of parameter estimation in maximum likelihood techniques adopted in GLS models. Unlike other Pseudo R-squares, McFadden's technique also includes possibility of calculating the Adjusted R-

square that takes into account the number of predictors in the model. Both predictors were found to be significant at level 5% as shown by their respective Z-statistics that both had p-values less than 0.05. The constant term for this model was found to be insignificant as shown by the p-value which was greater than 0.05 implying a linear effect through the origin. The resulting model was thus given by the equation below.

$$\hat{\bar{Y}}_{it} = 0.061\bar{X}_{it}^1 + 0.018\bar{X}_{it}^2$$

This equation generated from the model does not include the constant term which was found to be insignificant. This implied that when the predictors; capital adequacy and Loan advance ratio are both at 0, no performance (non-performing loans to total loans) are expected.

Table 4. 14: Regression Results for Credit Risks on Loan Performance

Coefficients: generalized least squares				
Panels: heteroscedastic with cross-sectional correlation				
Correlation: no autocorrelation				
Pseudo R-square	**Adjusted R-square**	**Log likelihood**	Wald chi2(3)	Prob > chi2
0.002	0.005	592.3073	14.86	0.001
	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
capital_adequacy	0.061	0.023	2.680	0.007
loan_advance_ratio	0.018	0.006	3.030	0.002
_cons	0.009	0.011	0.840	0.402

The results for this joint effect model was used to test the suppositions and get deductions on the first 2 aims of the study regarding the influence of credit risks on the loan performance of deposit DTSs in Kenya.

H$_{01}$: Capital adequacy has no significant influence on the loan performance of DTSs in Kenya.

From the joint effect GLS model, the coefficient estimate of capital adequacy was found to have a p-value of 0.007 which was less than 0.05. The null hypothesis was thus rejected and a conclusion drawn that capital adequacy had a significant influence on the loan performance of DTSs in Kenya.

H$_{02}$: Loan advance ratio has no significant influence the loan performance of DTSs in Kenya.

From the joint effect GLS model, the coefficient estimate of loan advance ratio was found to have a p-value of 0.002. This p-value was less than 0.05 thus the null hypothesis was rejected and a conclusion drawn that Loan advance ratio had a notable impact on the loan performance of DTSs in Kenya.

4.4.5 Moderating Effect of Firm Size

The study considered firm size as a possible moderating variable that influence the relationship between credit risks and loan performance. To assess the moderating effect of firm size which was measured by the natural logged total assets, hierarchical regression modelling was carried out based on the GLS fitted model. In this technique, the structure of the model was amended in hierarchies by addition of the variable firm size to the model in model 2 and inclusion of interaction terms between firm size and each of the predictors in model 3. Likelihood ratio tests were then carried out to assess the hierarchical structural changes at each between the models.

Table 4.15 shows the likelihood ratio test to assess the structural change due from model 1 to model 2 due to the addition firm size in model 2. The change in the Likelihood ratio (LR) chi-square statistic due to this addition was found to be 107.46 with a p-value of 0.000 which is less than 0.05. The Akaike's information criterion (AIC) and Bayesian information criterion (BIC) statistics show lower statistics for model 2 than model 1. A model with a lower AIC and BIC so considered as a better model. The Likelihood ratio test statistics thus show that the addition firm size significantly changes the structure of the model for the better as it results into a significantly improved model.

Table 4. 15: Likelihood Ratio Test between Model 1 and Model 2

Likelihood-ratio test			LR chi2(1)	=	107.46
(Assumption: Model 1 nested in Model 2)			Prob > chi2	=	0.000
Akaike's information and Bayesian information criterion					

Model	Obs	ll(null)	ll(model)	Df	AIC	BIC
1	675	.	592.307	138	-908.615	-285.584
2	675	.	646.039	139	-1014.077	-386.532

The mere significance of firm size in the model does not confirm it as a moderating variable with an effect on the relationship between credit risks and loan performance. To appropriately test the moderating effect of firm size, interaction terms between firm size and the predictors;

capital adequacy and loan advance ratio were generated and added to the model as model 3 and the effect of the change tested.

The likelihood ratio test on the result of the structural change from model 2 to model 3 is presented in table 4.16. The change in the LR chi-square statistic was found to be insignificant with a p-value of 1 which is greater than 0.05. Both the AIC and BIC statistics of model 2 model were found to be less than the corresponding values for model 3 implying that model 2 is a better model in comparison to model 3. This Likelihood ratio test thus confirms that the structural change due to addition of the interaction terms are of no significant improvement to the model and thus no significant moderating effect on the relationship between credit risks and loan performance.

Table 4. 16: Likelihood Ratio Test between Model 2 and Model 3

Likelihood-ratio test				**LR chi2(1)**	**=**	**-266.70**
(Assumption: Model 2 nested in Model 3)				Prob > chi2	=	1.0000
Akaike's information and Bayesian information criterion						
Model	**Obs**	**ll(null)**	**ll(model)**	**Df**	**AIC**	**BIC**
2	675	.	646.039	139	-1014.077	-386.532
3	675	.	512.687	141	-743.375	-106.800

Table 4.17 shows a summary table of the hierarchical GLS regression model where model 1 represents the coefficient estimates before inclusion of firm size as a predictor, model 2 presents the coefficients of the 3 predictors including firm size and model 3 included the interaction terms. In model 1, both capital adequacy and loan advance ratio were noted to have had significant influence on loan performance. In model 2 the added variable (firm size) was found to also have a significant influence on loan performance as shown by the p-value of this coefficient estimate (β =-0.020, Z= -4.830, p-value = 0.000) which was less than 0.05. The coefficient of capital adequacy in model 2 was however noted to become insignificant. In model 3 it was noted that one of the interaction terms between firm size and loan advance ratio was seen to have a p-value that was less than 0.05. However as earlier shown by the LR test, the additions do not show significant improvement.

Table 4. 17: Summary Moderating Effect of Firm Size

Coefficients: generalized least squares

| Panels: heteroskedastic with cross-sectional correlation | | Wald chi2(5)- M 3 | = | 29.71 |

Correlation: no autocorrelation — Prob > chi2 - M 3 = 0.000

Model	Predictors	Coeff	Bootstrap Std. Err.	Z	P>/z/
1	capital_adequacy	0.061	0.023	2.680	0.007
	loan_advance_ratio	0.018	0.006	3.030	0.002
	_cons	0.009	0.011	0.840	0.402
	Capital_adequacy	0.009	0.028	0.320	0.746
2	Loan_advance_ratio	0.016	0.006	2.580	0.010
	Firm size	-0.020	0.004	-4.830	0.000
	_cons	0.447	0.090	4.970	0.000
	capital_adequacy	0.480	0.434	1.110	0.269
	loan_advance_ratio	-0.210	0.116	-1.810	0.071
3	Firm size	-0.030	0.011	-2.700	0.007
	capital_adequacy interaction Firm size	-0.022	0.022	-1.010	0.311
	loan_advance_ratio interaction Firm size	0.011	0.006	1.970	0.049
	_cons	0.642	0.232	2.770	0.006

The results of the hierarchical regression model were used to test the third hypothesis and draw conclusions on the third objective of the study. Specifically, the change in LR statistic from model 2 to 3 was used as the rejection criteria as this was the step in which the interaction terms that determine moderation effects were added.

H$_{03}$: Firm size has no significant influence on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

The P-value of the LR change chi-square statistic due to the addition of the interaction terms between firm size and credit risks components was found to be 1.000 which was greater than 0.05. The investigator thus failed to discard the null hypothesis and concluded that. Firm size had no significant influence on the moderating connection amid credit risk and loan performance of deposit taking SACCOs in Kenya. However, model 2 in the hierarchical regression analysis showed that on addition of firm size as a predictor to the previous model1, the coefficient of capital adequacy a component of credit risks was rendered insignificant. This second model with a significant influence by firm size and insignificant influence of capital adequacy was however also shown to be a significant improvement to model 1. The change of the influence of the coefficient of capital adequacy from significance to

insignificance due to inclusion of firm size was a possible indication of a mediation effect rather than that of a moderation effect. A study could therefore be carried out to explore the mediation effect of firm size in relation to credit risks and loan performance.

Table 4. 18: Summary of Hypothesis Tests

Hypothesis	Results	Conclusion
$H_{01:}$ Capital adequacy has no significant influence on the loan performance of deposit taking SACCOs in Kenya.	Significant coefficient estimate (β =0.061, Z= 2.680, p-value = 0.007). The p-value is less than 0.05 implying a significant effect.	Reject H_{01}
$H_{02:}$ Loan advance ratio has no significant influence the loan performance of deposit taking SACCOs in Kenya.	Significant coefficient estimate (β =0.018, Z= 3.030, p-value = 0.002). The p-value is less than 0.05 implying a significant effect.	Reject H_{02}
$H_{03:}$ Firm size has no significant influence on the moderating relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.	A change in LR Chi-square statistic of -266.70 from model 2 to model 3 with a p-value of 1.000 which is greater than 0.05. This shows that there is no significant change in the likelihood ratio from model 2 to 3 upon addition of the interaction terms.	Fail to reject H_{03}

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

In this chapter, a summary of the study findings and the resulting conclusions drawn and recommendations from of the findings are presented. The chapter also further provides suggestions on areas to be further studied in line with the findings, conclusions and shortcomings. The conclusions were drawn and discussed aligned to each specific objective and their corresponding hypothesis.

5.1 Discussion of Findings

The investigation aimed to determine influence of firm size on the relationship credit risk and loan performance of deposit taking Saccos' in Kenya. Secondary data corresponding to the specific objectives of the study was collected and analyzed. Analysis involved descriptive analysis of each study variable and the indicators used to measure them. Inferential analysis was then undertaken to assess the causal association amid the investigation's variables. The indicators used to measure the study variables were core capital, total assets, total loans, total deposits and non-performing loans. All these variables were noted to increase over time. This generally showed a tendency of growth in the industry which also tended to more homogeneous with time implying that all the entities reported varying levels of growth. The mean core capital in the industry in year 2013 was 264 million which increased over the years to 601 million in the year 2017. The total assets also increased from 179 million in 2013 to 374 million in 2017. The mean total loans issued in the industry in year 2013 were 1.44 billion which was seen to be on an increasing trend over the years to 5.02 billion in the year 2017. The total deposits also increased from 1.28 billion in 2013 to 2.85 billion in 2017. The overall mean non-performing loans in 2013 amounted to 65 million Kenya shillings which increased annually to 128 million Kenya shilling in 2017. Kisala (2014) undertook an investigation on the effect of credit risk supervision rehearsals on loan performance in microfinance institutions in Kenya. The investigation found that there was strong relationship between loan performance of microfinance institutions with credit risk management, the investigation also revealed that there existed greater variation on loan performance of microfinance as results of change in GDP growth rate, the study further revealed that there was a significant relationship between loan performance of MFIs, interest spread and interest rate charged on loans.

5.2.1 Influence of Capital Adequacy on the Loan Performance of Deposits Taking Saccos' in Kenya.

The ratio of observed variables core capital of the SACCO to the total assets was utilized in quantifying capital adequacy of the DT SACCOs while loan performance was quantified as a ratio of non-performing advances to the aggregate loans. The mean loan performance ratio was found to be 0.127 with a standard deviation of 0.659. The standard deviation of loan performance within groups was larger than that between groups which showed that the industry was less heterogeneous across the entities compared to the changes over time. The overall mean capital adequacy ratio was found to be 0.261 with a standard deviation of 0.303. It was also noted that the standard deviation of core capital within groups was larger than that between groups. This showed less heterogeneity across the entities as there are more changes in the capital adequacy over time (within groups) than across the industry (between groups).

The outcomes of the inferential examination showed that capital sufficiency had a noteworthy association with loan performance. The coefficient of capital adequacy in the bivariate regression model was found to be significant ($\beta= -0.240$, p-value = 0.010). The results suggested that a percentage increase ratio of capital adequacy was associated with 2.4% upsurge in the ratio of non-performance of loans. It is expected that with time the entities experience growth in terms of asset base. Growth in assets if experienced alongside further growth in core capital would result into increased capital adequacy which would result into decreased non-performance of loan. Otherwise, entities that only grow their assets without considering increasing their core capital would have a decrease in their capital adequacy ratio resulting into increased non-performance of loans. The findings were consistent with a study carried out by Essendi (2013) on the impact of credit risk supervision on credit portfolio amid Saccos in Kenya. The researcher concluded that most Savings and Credit Co-operatives in Kenya have an advance risk supervision strategy the set up. This strategy would be extremely important in giving rules on the best way to deal with the different dangers these associations experience in their part loaning exercises. It was additionally reasoned that CAMEL rating framework assumes a basic focal job in the appraisal of the adequacy of the associations. Capital sufficiency, the executive's quality, income and liquidity were altogether found to have positive coefficients in connection to advance portions in Saccos while resource quality was found to have a negative coefficient.

5.2.2 Influence of Loan Advance Ratio on the Loan Performance of Deposits Taking Saccos' in Kenya.

Loan advance ratio which was also an independent variable in this study was measured as a ratio of the observed aggregate loans and advances to the total deposits of the SACCOs. The mean Loan advance ratio was 1.563 with a standard deviation of 1.059. The average being greater than one implying that on average, the DT SACCOs tend to give loans and advances that exceed the deposits collected. The variation in the loan advance ratio when decomposed to the components of the panel data levels was found to depict higher variation within groups (over time within the entities) than between groups (cross-sectional).

The study also found the loan advance ratio had a noteworthy correlation with the performance of loans (β= 0.091, p-value = 0.000). The outcomes showed that increasing the ratio of loan advancement to the total deposits was associated with a positive effect on the ratio of loan non-performance to the total loans. The trends in both deposits and total loans issued were seen to be increasing over time with fewer differences between the firms. This shows that the industry was still bound to experience growth in both deposits and total loans, however, the growth in total loans had been observed to grow faster over the years compared to the growth in deposits resulting to an increase in loan advance ratio. In relation to the performance of loans, this ratio was seen to increase the ratio of non-performance of loans. It is thus expected that should the trend of higher increase in loans than deposits persist, the DT SACCOs will experience increased poor performance in loans issued. The findings were consistent with a study carried out by Gweyi, Olweny, & Oloko (2018) on the influence of financial risk on the financial performance of DTSs in Kenya. The investigators gave recommendations which included putting up a clear acclaim strategy that will not adversely impact profitability and also, they would desire to ascertain how acclaim strategy affect the functioning of their DTSs to guarantee cautious exploitation of deposits and intensification of profit. Deposit Taking Saccos should manage liquidity risk by reinforcing its own resources since depositors could at any time and under unexpected reasons withdraw their deposits from the Sacco to seek investment elsewhere with higher returns. Deposit Taking Saccos in Kenya should also ensure that they adopt and implement a sound operational risk management practice.

5.2.3 Influence of Firm Size on the Relationship between Credit Risk and Loan Performance of Deposit Taking Saccos' in Kenya.

The moderating variable firm size in the study was measured as the normal logarithm of the aggregate assets. The overall mean of the firm size measure was 21.094 with a standard deviation of 1.258. The variation within the entities (over time) was found to be slightly greater than the cross-sectional variation between the entities as was the case with the other variables. To assess impact of firm size on the relationship between credit risks and performance of loans, a hierarchical model was fitted where firm size and interactions between firm size and credit risks were added to the model. The first model was a multiple regression which showed a significant joint influence of the components of credit risks (capital adequacy and loan advance ratio) on loan performance. On including firm size, the change in the Likelihood ratio (LR) chi-square statistic due to this addition was found to be 107.46 with a p-value of 0.000 which was less than 0.05. The Akaike's information criterion (AIC) and Bayesian information criterion (BIC) statistics also decreased with this additional variable for the second model. On inclusion of the interaction terms between firm size and the components of credit risks, the change in the LR chi-square statistic was found to be insignificant with a p-value of 1 which was greater than 0.05. The AIC and BIC statistics of the second model were found to be less than the corresponding values for third model. These results implied that the second model with firm size was a better model in comparison to the third model and the first joint model without firm size. The findings were consistent with a study carried out by Gweyi, Olweny, & Oloko (2018) on the influence of financial risk on the fiscal performance of Deposit Taking Saccos in Kenya. The study concluded that firm size had a controlling influence on the association amid financial risk and fiscal performance of deposit taking Saccos in Kenya.

5.2 Conclusions of the Study

The study increased knowledge by assessing influence of firm size on the relationship between credit risk and loan performance of DTSs in Kenya. The investigation generally concluded that credit risks significantly influenced the performance of loans of DTSs in Kenya.

5.2.1 Influence of capital adequacy on the loan performance of deposits taking Saccos' in Kenya.

The hypothesis formulated for this objective was tested based on the findings from the estimated models. The findings resulted into a rejection of the null hypothesis and a deduction that capital adequacy significantly influence the loan performance of deposits taking Saccos' in Kenya. The direct influence of capital adequacy showed a negative effect on the ratio of non-performance of loans to aggregate loans. This shows that by increasing capital adequacy would result into a reduction in this non-performance ratio which is an implication of increased performance of the loans. Increasing capital adequacy would increase the total loans being issued in comparison to the non-performing loans thus an indication of better performance.

5.2.2 Influence of loan advance ratio on the loan performance of deposit taking Saccos' in Kenya.

From the investigation's findings, the null hypothesis linked to this objective was rejected and a deduction drawn that LAR significantly influences the performance of loans in the deposits taking Saccos' in Kenya. The direct effect of loan advance ratio showed a positive influence on the ratio of non-performance of loans to aggregate loans. This shows that by increasing LAR would result in an upsurge in this ratio of non-performance which was an implication of reduced performance of the loans. Issuing more loans and advances in excess of the DT SACCOs total deposits would result into reduced performance of loans.

5.2.3 Influence of firm size on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

In relation to this objective, the investigator failed to reject the null hypothesis and concluded that firm size quantified in terms of the aggregate assets has no significant controlling influence on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya. Firm size was however found to significantly influence the ratio of non-performing loans to aggregate loans negatively. This implied that a larger firms' in terms of assets is bound to have a reduced level of the non-performance and thus a better performance of loans. However, increasing the firm's assets would not influence how credit risks relate to performance.

5.3 Recommendations of the Study

Following the conclusions drawn from the study the following recommendations were made;

5.3.1 Influence of capital adequacy on the loan performance of deposits taking Saccos' in Kenya.

Deposit Taking SACCOs need to ensure they retain high capital adequacy ratios in order to realize good performance of loans. The study concluded that increasing capital adequacy results into better performance of loans. As the Deposit Taking SACCOs strive to increase their assets, it is vital that they ensure the core capital is also relatively increased otherwise the increase in assets would be associated to increased liabilities which would in the long-run be characterized by inadequate capital (a reduction in capital adequacy ratio) resulting to a reduction in the performance of loans.

5.3.2 Influence of loan advance ratio on the loan performance of deposits taking Saccos' in Kenya.

It is also recommended that the Deposit Taking SACCOs should maintain low loan advance ratios in order to realize better performance of loans. The study concluded that high loan advance ratios increases the ratio of non-performance of loans to total loans. In the event of working towards increasing sales of loan products and advances, Deposit Taking SACCOs should ensure that the amounts of loans issued are kept in check relative to the total deposits to keep the loan advance ratio low. To increase volumes of loans and advances issued, the Deposit Taking SACCOs should strive for more member deposits to raise the sales volumes without increasing the loan advance ratio and result into poor performance of loans issued.

5.3.3 Influence of firm size on the relationship between credit risk and loan performance of deposit taking Saccos' in Kenya.

The study failed to reject the null hypothesis and recommended that firm size measured in terms of the total assets has no significant influence on the relationship between credit risk and loan presentation of deposit taking Saccos' in Kenya. It was also noted that firm size could act as a mediating variable of credit risks and loan performance rather than a moderating variable. Assessing the mediating effect was beyond the methodological scope of this study.

5.4 Areas for Further Research

It was found and concluded that firm size measured in terms of asset volumes influence the performance of loans but does not moderate the relationship between credit risks and loan performance. Other studies can be carried out exploring a change in the conceptual measurement model of firm to consider other plausible observable indicators (measurements) of firm size such as number of registered members.

It was also noted that firm size could act as a mediating variable of credit risks and loan performance rather than a moderating variable. Assessing the mediating effect was beyond the methodological scope of this study. It is therefore suggested that other studies be carried out considering an objective that covers assessment of the mediating effect of firm size (measured in terms of asset volumes) on the relationship credit risks and loan performance in the methodology.

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APPENDICES

Appendix I: Secondary Data Collection Tool

VARIABLE	DESCRIPTION	2013	2014	2015	2016	2017
Capital Adequacy	Core Capital					
	Total Asset					
Loan Advance Ratio	Total Loans and Advances					
	Total Deposits					
Firm Size	Log. Of Total Assets					
Loan Performance	Non-performing Loans					
	Total Loans and Advances					

Appendix II: Sasra Licensed Deposit Taking Saccos in Kenya – 2017

1. Yetu Sacco Society Limited

2. Winas Sacco Society Limited

3. Wevarsity Sacco Society Limited

4. Waumini Sacco Society Limited

5. Washa Sacco Society Limited

6. Wanandege Sacco Society Limited

7. Wananchi Sacco Society Limited

8. Wanaanga Sacco Society Limited

9. Wakulima Commercial Sacco Society Limited

10. Wakenya Pamoja Sacco Society Limited

11. Vision Point Sacco Society Limited

12. Vision Afrika Sacco Society Limited

13. Victas Sacco Society Limited

14. Vihiga County Sacco Society Limited

15. Universal Traders Sacco Society Limited

16. Un-Sacco Society Limited

17. Unison Sacco Society Limited

89. Mombasa Port Sacco Society Limited

90. Moi University Sacco Society Limited

91. Miliki Sacco Society Limited

92. Metropolitan National Sacco Society Ltd

93. Mentor Sacco Society Limited

94. Maisha Bora Sacco Society Limited

95. Magereza Sacco Society Limited

96. Magadi Sacco Society Limited

97. Mafanikio Sacco Society Limited

98. Lengo Sacco Society Limited

99. Lamu Teachers Sacco Society Limited

100. Lainisha Sacco Society Limited

101. Kwetu Sacco Society Limited

102. K- Unity Sacco Society Limited

103. Koru Sacco Society Limited

104. K-Pillar

105. Sacco Society Limited

106. Kolenge Sacco Society Limited

18. Uni-County Sacco Society Limited	107. Kmfri Sacco Society Limited
19. Unaitas Sacco Society Limited	108. Kitui Teachers Sacco Society Limited
20. Ukulima Sacco Society Limited	109. Kite Sacco Society Limited
21. Ukristo Na Ufanisi Wa Anglicana Sacco Society Limited	110. Kipsigis Edis Sacco Society Limited
22. Ufanisi Sacco Society Limited	111. Kingdom Sacco Society Limited
23. Uchongaji Sacco Society Limited	112. Kimbilio Daima Sacco Society Limited
24. Trans-National Times Sacco Society Ltd	113. Joinas Sacco Society Limited
25. Trans-Elite Sacco Society Limited	114. Kenya Police Sacco Society Limited
26. Trans-Counties Sacco Society Limited	115. Kenya Midlands Sacco Limited
27. Trans Nation Sacco Society	116. Kenya Highlands Sacco Society Limited
28. Tower Teachers Sacco Society Ltd	117. Kenya Bankers Sacco Society Limited
29. Times- U Sacco Society Limited	118. Kenya Achievas Sacco Society Limited
30. Thamani Growers Sacco Society Ltd	
31. Tenhos Sacco Society Limited	119. Kenversity Sacco Society Limited
32. Tembo Sacco Society Limited	120. Kenpipe Sacco Society Limited
33. Telepost Sacco Society Limited	121. Kathera Sacco Society Limited
34. Taraji Sacco Society Limited	122. Ig Sacco Society Ltd
35. Tabasamu Sacco Society Limited	123. Kaimosi Sacco Society Limited
36. Taqwa Sacco Society Ltd	124. Jumuika Sacco Society Limited
37. Taifa Sacco Society Limited	125. Jitegemee Sacco Society Limited

38. Tai Sacco Society Limited	126. Jamii Sacco Society Limited
39. Supa Sacco Society Limited	127. Jacaranda Sacco Society Limited
40. Sukari Sacco Society Limited	128. Imenti Sacco Society Limited
41. Suba Teachers Sacco Society Limited	129. Imarisha Sacco Society Limited
42. Stima Sacco Society Limited	130. Imarika Sacco Society Limited
43. Stake Kenya Sacco Society Limited	131. Ilkisonko Sacco Society Limited
44. Southern Star Sacco Society Limited	132. Hazina Sacco Society Limited
45. Sotico Sacco Society Limited	133. Harambee Sacco Society Limited
46. Solution Sacco Society Limited	134. Gusii Mwalimu Sacco Society Limited
47. Smart Life Sacco Society Limited	135. Goodway Sacco Society Limited
48. Smart Champion Sacco Society Limited	136. Good Hope Sacco Society Limited
49. Skyline Sacco Society Limited	137. Good Faith Sacco Society Limited
50. Siraji Sacco Society Limited	138. Githunguri Dairy Sacco Society Limited
51. Simba Chai Sacco Society Limited	139. Fundilima Sacco Society Limited
52. Shoppers Sacco Society Limited	140. Fortune Sacco Society Limited
53. Shirika Sacco Society Limited	141. Fariji Sacco Society Limited
54. Sheria Sacco Society Limited	142. Faridi Sacco Society Limited
55. Safaricom Sacco Society Limited	143. Enea Sacco Society Limited
56. Rachuonyo Teachers Sacco Society Ltd	144. Elimu Sacco Society Limited
57. Qwetu Sacco Society	145. Elgon Teachers Sacco Society Limited

58. Puan Sacco Society Limited	146. Egerton Sacco Society Limited
59. Prime-Time Sacco Society Limited	147. Eco-Pillar Sacco Society Limited
60. Patnas Sacco Society Limited	148. Dumisha Sacco Society Limited
61. Orient Sacco Society Limited	149. Dimkes Sacco Society Limited
62. Ollin Sacco Society Limited	150. Dhabiti Sacco Society Limited
63. Nyati Sacco Society Limited	151. Daima Sacco Society Limited
64. New Fortis Sacco Society Limited	152. County Sacco Society Limited
65. Nyamira Tea Farmers Sacco Society Ltd	153. Cosmopolitan Teachers Sacco Society Ltd
66. Nyambene Arimi Sacco Society Limited	154. Comoco Sacco Society Limited
67. Nyala Vision Sacco Society Limited	155. Chuna Sacco Society Limited
68. Nufaika Sacco Society Limited	156. Chai Sacco Society Limited
69. Noble Sacco Society	157. Centenary Sacco Society Limited
70. Nrs Sacco Society Limited	158. Capital Sacco Society Limited
71. Nitunze Sacco Society Limited	159. Boresha Sacco Society Limited
72. Ng'arisha Sacco Society Limited	160. Bingwa Sacco Society Limited
73. Nanyuki Equator Sacco Society Limited	161. Biashara Sacco Society Limited
	162. Bi-High Sacco Society Limited
74. Ndosha Sacco Society Limited	163. Baraton University Sacco Society Limited
75. Ndege Chai Sacco Society Limited	164. Baraka Sacco Society Limited
76. Nawiri Sacco Society Limited	165. Bandari Sacco Society Limited

77. Nation Sacco Society Limited	166. Azima Sacco Society Limited
78. Nassefu Sacco Society Limited	167. Asili Sacco Society Limited
79. Nandi Hekima Sacco Society Limited	168. Ardhi Sacco Society Limited
80. Nandi Farmers Sacco Society Limited	169. Amica Sacco Society Limited
81. Nafaka Sacco Society Limited	170. All Churches Sacco Society Limited
82. Nacico Sacco Society Limited	171. Airports Sacco Society Limited
83. Mwito Sacco Society Limited	172. Ainabkoi Sacco Society Limited
84. Mwingi Mwalimu Sacco Society Limited	173. Agro-Chem Sacco Society Limited
85. Mwietheri Sacco Society Limited	174. Afya Sacco Society Limited 2nk Sacco Society Limited
86. Mwalimu National Sacco Society Ltd	175. 2nk Sacco Society Limited
87. Muki Sacco Society Limited	
88. Mudete Tea Growers Sacco Society Ltd	