

**CREDIT RISK MANAGEMENT PROCESSES AND THE
OPERATIONAL PERFORMANCE OF AGRICULTURAL
COOPERATIVES IN NAIROBI METROPOLITAN AREA:
MODERATED BY FIRM SIZE**

**IBRAHIM MULABI SHIVEKA
ADM 149939**

**A RESEARCH THESIS SUBMITTED TO STRATHMORE BUSINESS SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE DEGREE OF MASTER OF COMMERCE**

**STRATHMORE BUSINESS SCHOOL.
STRATHMORE UNIVERSITY, NAIROBI, KENYA.**

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

© No part of this dissertation may be reproduced without the permission of the author and Strathmore University

Name of Candidate: Ibrahim Mulabi Shiveka

Approval

The dissertation of Ibrahim Mulabi Shiveka was approved by the following:

Name of Supervisor: Dr Albert Abang'a

School/Institute/Faculty: Strathmore University Business School.

Dr. Ceaser Mwangi

Executive Dean

Strathmore University Business School.

Prof. Bernard Shibwabo

Director, Office of Graduate Studies

ABSTRACT

The access to finance for agricultural activities remains a major challenge for farmers, particularly small-scale farmers. Despite agriculture's substantial contribution to Kenya's GDP, lending to the sector remains disproportionately low. Therefore, the study sought to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size. The specific objectives were: to establish the effect of credit risk assessment, credit risk monitoring, credit risk identification and credit risk control on the performance of agricultural cooperatives in Nairobi Metropolitan area. The study is anchored on Credit Risk Theory, Credit Rationing Theory, and Information Asymmetry Theory. The study adopted a positivist research philosophy; the correlational research design was also used. The population of interest in this study was 40 agricultural cooperatives registered and active in the Nairobi Metropolitan Area that features Nairobi, Kiambu, Machakos, Kajiado and Murang'a counties. Primary data was collected from 120 Credit Officers (3 individuals per cooperative). Descriptive statistics was used to examine the quantitative data and provide percentage ratings and frequencies. Credit risk assessment was found to be positively and significantly correlated with performance. The study found that credit risk monitoring was positively and significantly correlated with performance; credit risk identification was positively and significantly correlated with performance; and firm size has a positive and significant moderating effect on the relationship between credit risk management processes and the performance of agricultural cooperatives in Kenya. Since the Odds Ratios for credit assessment and credit risk monitoring are both < 1 , this indicates lower odds of these variables falling into a higher category; whereas given that the ORs for credit risk identification and credit risk control are > 1 , this indicates higher odds of these variables falling into higher category. The p-values for these variables indicated that Credit Risk Assessment and Credit Risk Identification have a significant impact on the likelihood of belonging to a higher category of Performance; whereas Credit Risk Monitoring and Credit Risk Control do not have a significant impact on the likelihood of belonging to a higher category of Performance. The study recommended that the Government should reinforce its credit information sharing policies by involving key stakeholders such as Credit Reference Bureaus as well as all financial institutions including agricultural cooperatives so as to promote more responsible lending. The management of the cooperative should establish robust internal policies and procedures to act as a first line of debt recovery including strict appraisal of loan applications on the basis of the borrower's ability to repay, and having a first lien over a member's shares or deposits that the cooperative can use to recover debts as a way of enhancing credit monitoring and control.

TABLE OF CONTENTS

DECLARATION	i
ABSTRACT.....	ii
TABLE OF CONTENTS	iii
LIST OF FIGURES.....	vii
LIST OF TABLES.....	viii
LIST OF ABBREVIATIONS	ix
DEFINITION OF TERMS	x
CHAPTER ONE	13
INTRODUCTION	13
1.1 Background of the Study.....	13
1.1.1 Performance of Agricultural Cooperatives	17
1.1.2 Credit Risk Management Processes.....	20
1.1.3 Firm Size.....	21
1.1.4 Agricultural Cooperatives in Kenya	23
1.2 Statement of the Problem.....	23
1.3 Research Objectives	24
1.3.1 General objective	25
1.3.2 Specific objective.....	25
1.4 Research Questions	25
1.5 Scope of the study	25
1.6 Significance of the Study	26
1.6.1 Government Agencies	26
1.6.2 Agricultural Cooperatives.....	26
1.6.3 Academicians.....	27
1.7 Chapter Summary	27
CHAPTER TWO	28
LITERATURE REVIEW	28
2.1 Introduction.....	28
2.2 Theoretical Review	28
2.2.1 Credit Risk Theory	28
2.2.2 Credit Rationing Theory	30
2.2.3 Information Asymmetry Theory	31
2.3 Empirical Review.....	33

2.3.1	Credit Risk Assessment and Performance	34
2.3.2	Credit Risk Monitoring and Performance.....	37
2.3.3	Credit Risk Identification and Performance	40
2.3.4	Credit Risk Control and Performance.....	44
2.3.5	The Moderating Effect of Firm Size.....	46
2.4	Summary of Literature and Research Gaps	49
2.5	Conceptual Framework	49
2.6	Operationalization of Study Variables	51
2.7	Chapter Summary	52
CHAPTER THREE.....		53
RESEARCH METHODOLOGY		53
3.1	Introduction	53
3.2	Research Philosophy	53
3.3	Research Design.....	53
3.4	Population of the Study.....	54
3.5	Sampling Design	54
3.6	Data Collection Methods	55
3.7	Research Quality	55
3.8	Data Analysis	59
3.8.1	Diagnostic Tests.....	60
3.9	Ethical Considerations	61
3.10	Chapter Summary	62
CHAPTER FOUR		63
PRESENTATION OF RESULTS.....		63
4.1	Introduction.....	63
4.2	Response Rate	63
4.3	Demographic Characteristics of the Respondents	63
4.3.1	Title of Respondents	64
4.3.2	Length of Employment	64
4.3.3	Familiarity with Credit Risk Management Processes.....	65
4.4	Descriptive Analyses.....	66
4.4.1	Credit Risk Assessment and Performance	66
4.4.2	Credit Risk Monitoring and Performance.....	67
4.4.3	Credit Risk Identification and Performance	69

4.4.4	Credit Risk Control and Performance.....	71
4.4.5	The Moderating Effect of Firm Size.....	72
4.4.6	Performance	73
4.5	Pearson Correlation Analysis.....	75
4.6	Diagnostic Test Results.....	77
4.6.1	Multicollinearity Test Results.....	77
4.6.2	Normality Test Results	77
4.6.3	Heteroscedasticity Test Results	79
4.6.4	Linearity Test Results	79
4.7	Multiple Regression Analysis	81
4.7.1	Overall Regression Model	81
4.7.2	Credit Risk Assessment Regression Model.....	83
4.7.3	Credit Risk Monitoring Regression Model.....	84
4.7.4	Credit Risk Identification Regression Model	86
4.7.5	Credit Risk Control Regression Model.....	87
4.7.6	Moderation Effect of Firm Size.....	89
4.8	Chapter Summary	91
CHAPTER FIVE		92
DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS.....		92
5.1	Introduction.....	92
5.2	Summary of the Main Results.....	92
5.3	Discussion of the Results	92
5.3.1	Credit Risk Assessment and Performance	92
5.3.2	Credit Risk Monitoring and Performance.....	93
5.3.3	Credit Risk Identification and Performance	94
5.3.4	Credit Risk Control and Performance.....	95
5.3.5	Moderating Effect of Firm Size.....	95
5.4	Conclusions.....	96
5.5	Recommendations.....	97
5.5.1	Policy Recommendations	97
5.5.2	Managerial Recommendations	97
5.5.3	Contribution to Knowledge	98
5.5.4	Implications for Academia and Research	98
5.6	Limitations of the Study.....	99

5.7	Suggestions for Further Studies	99
REFERENCES		100
APPENDICES		119
APPENDIX I: QUESTIONNAIRE		119
APPENDIX II: BUDGET		127
APPENDIX III: WORK PLAN 2025-2026.....		128
APPENDIX IV: Distribution of Target Population		129
APPENDIX V: Summary of Literature Review Map.....		131
APPENDIX VI: NACOSTI RESEARCH PERMIT.....		144
APPENDIX VII: ETHICAL CLEARANCE		145

LIST OF FIGURES

Figure 2. 1: Conceptual Framework	50
Figure 4. 1: Distribution of Title of Respondents.....	64
Figure 4. 2: Distribution of Length of Employment.....	65
Figure 4. 3: Distribution of Familiarity with Credit Risk Management Processes	66

LIST OF TABLES

Table 2. 1: Operationalization of Variables.....	51
Table 3. 1: Distribution of Target Population.....	129
Table 4. 1: Response Rate.....	63
Table 4. 2: Descriptive Results of Credit Risk Assessment.....	67
Table 4. 3: Descriptive Results of Credit Risk Monitoring.....	69
Table 4. 4: Descriptive Results of Credit Risk Identification	70
Table 4. 5: Descriptive Results of Credit Risk Control.....	72
Table 4. 6: Descriptive Results of Firm Size	73
Table 4. 7: Descriptive Results of Performance.....	75
Table 4. 8: Multicollinearity Test Results	77
Table 4. 9: Normality Test Results	78
Table 4. 10: Heteroscedasticity Test Results	79
Table 4. 11: Linearity Test Results	80
Table 4. 12: Pearson Correlation Analysis.....	76
Table 4. 13: Model Fitting Information – Overall Regression Model	82
Table 4. 14: Goodness of Fit – Overall Regression Model.....	82
Table 4. 15: Pseudo R-Square – Overall Regression Model.....	82
Table 4. 16: Parameter Estimates.....	82
Table 4. 17: Model Fitting Information – Credit Risk Assessment Regression Model	83
Table 4. 18: Goodness-of-Fit – Credit Risk Assessment Regression Model	84
Table 4. 19: Pseudo R-Square – Credit Risk Assessment Regression Model.....	84
Table 4. 20: Parameter Estimates for Credit Risk Assessment	84
Table 4. 21: Model Fitting Information – Credit Risk Monitoring Regression Model.....	85
Table 4. 22: Goodness-of-Fit – Credit Risk Monitoring Regression Model.....	85
Table 4. 23: Pseudo R-Square: Credit Risk Monitoring Regression Model	85
Table 4. 24: Parameter Estimates for Credit Risk Monitoring.....	86
Table 4. 25: Model Fitting Information – Credit Risk Identification Regression Model.....	86
Table 4. 26: Goodness-of-Fit – Credit Risk Identification Regression Model.....	87
Table 4. 27: Pseudo R-Square – Credit Risk Identification Regression Model	87
Table 4. 28: Parameter Estimates for Credit Risk Identification	87
Table 4. 29: Model Fitting Information – Credit Risk Control Regression Model.....	88
Table 4. 30: Goodness-of-Fit – Credit Risk Control Regression Model.....	88
Table 4. 31: Pseudo R-Square – Credit Risk Control Regression Model	88
Table 4. 32: Parameter Estimates for Credit Risk Control.....	89
Table 4. 33: Parameter Estimates for Moderation Effect of Firm Size.....	91

LIST OF ABBREVIATIONS

AGRA	Alliance for Green Revolution in Africa
CBA	Commercial Bank of Africa
CBK	Central Bank of Kenya
FI	Financial Institutions
FRM	Financial risk management
FSP	Financial Service Providers
GDP	Gross Domestic Product
ICT	Information and Communication Technology
KBA	Kenya Bankers Association
KNBS	Kenya National Bureau of Standards
NPL	Non-Performing Loans
SDG	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
USA	United states of America

DEFINITION OF TERMS

Commercial Banks; Financial organizations provide a comprehensive array of financial services to people, enterprises, and governmental entities. They generally concentrate on receiving deposits, extending loans, and delivering financial services (Kumar et al., 2020).

Credit Risk Assessment; The assessment of individual borrowing ability to settle the borrowed funds as well as determining likelihood of default, the assessment minimizes losses and makes informed lending decisions (Sudarsono, 2024).

Credit Risk Control; the process through which financial institutions install systems, procedures and processes that ensure the promptness of loan repayments from clients (Aluonzi et al., 2024).

Credit Risk Identification; This refers to the process through which organisations are able to determine the extent of risk exposures, the nature of the risks, and the risks associated with losses (Yanenkova et al., 2021).

Credit Risk Monitoring; This refers to the process through which financial institutions continuously evaluate the risks pertaining to the provision of loans to individuals, businesses or entities (Koulouridi et al., 2020).

Credit Risk Practices; The strategies, policies, and procedures that financial institutions use to identify, measure, mitigate, and manage the risk of borrower default which help banks, microfinance institutions, and lenders maintain financial stability (Meyer et al., 2023).

Firm Size; a relative classification of the scale and operating capacity of an organisation using metrics such as market capitalisation, total assets, number of employees, and total sales (Hashmi et al., 2020).

Performance; This refers to the determination of degree to which it is able to attain its goals and objectives, measured by evaluating the differences between the actual results and the anticipated outputs (Conțu, 2020).

Risk Management; It is a process designed to detect, analyse, and prioritize risks, followed by coordinated measures to minimize, monitor, and control the probability or repercussions of bad outcomes occurrences (Hamilton, 2020).

Risk-Based Pricing; Is a lending strategy where financial institutions, such as banks and credit providers, establish interest rates and loan conditions according to the evaluated risk profile of a borrower (Brahmaiah, 2022).

DEDICATION

I would like to dedicate this thesis to Almighty God my father, my strong pillar, my source of wisdom, knowledge and understanding throughout this academic journey. To my family, thank you for your unwavering support, encouragement, sacrifices and prayers that continually inspired me to persevere despite the challenges encountered along the way. Special appreciation goes to my supervisors, lecturers, and friends whose guidance, advice, and encouragement contributed greatly to the completion of this study. My wife Sharon, whose encouragement has made sure that I give it all to finish what I started. To my children Ella, Akim, and Isaac who have been affected in every way possible by this quest – Thank you. My love for you all cannot be quantified.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture plays a significant development role in a country's growth economy; it creates employment opportunities for the growing population, eradicates poverty and provides raw material to manufacturing industries (Jahira et al., 2021). An adept comprehension of the dynamics of performance of this sector is critical to unlocking its potential and one way in which this is possible is through the enhancement of operational performance (Mabeta, 2025). Organisational performance refers to a determination of degree to which it is able to attain its goals and objectives, measured by evaluating the differences between the actual results and the anticipated outputs (Conțu, 2020). It can also be referred to as an organisation's ability to achieve its goals and objectives efficiently and effectively (Sinnaiah et al., 2023).

An off-shoot of performance is operational performance, which refers to strategic facets of firms which are competing with other and includes measures such as efficiency, effectiveness, flexibility and service delivery (Liu et al., 2020). The performance of agricultural cooperatives is based on the extent to which they are able to enhance farmer's access to inputs and markets, increase their productivity, and improve their economic and social welfare by increasing their bargaining power and making the prices fair (Martínez-Lopez et al., 2023).

Globally, countries such as the United States have integrated a number of factors in pursuit of enhanced performance of agricultural cooperatives including strong governance, member participation and commitment, size, specialisation, management quality, and risk management strategies (Saad et al., 2019). In India, where the cooperative movement has been well established over several decades, the performance of agricultural cooperatives has been predicated on factors such as infrastructural facilities, financial resources, amenities, managerial competence, and level of specialisation (Pasa et al., 2024).

An assessment of the performance of agricultural cooperatives on the African continent, indicates that in Egypt, the amount of capital, human resources, administrative effectiveness, and fulfilment of cooperative objectives were the most salient performance

factors (Saad et al., 2023). Locally, studies have shown that the performance of agricultural cooperatives, when gauged from the perspective of the members, was measured by metrics such as effectiveness of training initiatives, linkage to markets, amount and frequency of credit available, and improvement in the income-generation capability of farmers (Miroro et al., 2023).

The determinants of the performance of agricultural cooperatives in Kenya are wide ranging. According to a study by KNBS (2020) despite the increment in the number of registered cooperatives from 1,030 with 355,000 members in 1963 to 20,901 with more than 10 million members in 2019, an estimated 35-60% of these have been inactive. Furthermore, Miroro et al. (2022) established that reducing membership in cooperatives, particularly agricultural cooperatives by smallholder farmers, as evidenced by a reduction from approximately 66% in the 1,557,000 cooperatives in 1982 to only 18% in 2019, has hampered the revenue generation capacity of agricultural cooperatives in Kenya. Kimetto and Kimani (2018) found that deficiencies in the level of trust and loyalty on cooperative management by smallholder farmers has eroded the social capital of agricultural cooperative societies leading to the incurrence of losses. Kamau and Genga (2019) stated that one of the most significant determinants of the performance of coffee cooperatives in Kiambu County, Kenya is the involvement of farmers in critical decision making because this improves the alignment of the cooperatives' objectives with those of the farmers and enhances the socioeconomic benefits accruing to the farmers.

Credit risk management processes are a critical component of cooperatives the world over given that one of the most important functions that they have is lending to members. E Saqib et al. (2016) affirmed that the absence of a 'one-size-fits-all' credit risk management strategy compels agricultural cooperatives in Pakistan to adopt a customised approach that is based on generic strategies such as risk reduction, income diversification, risk mitigation, crop diversification, the integration of crop insurance schemes, just to name a few. Omeje et al. (2022) posited that the adoption of effective credit risk management practices by cooperatives in Nigeria is dependent upon farming experience, level of education, level of income diversification, amount of credit sought, and previous experience with credit risk. According to Kabugu and Wamiori (2022), cooperatives in Kenya carry out a number of credit risk management practices including credit referencing of borrowers with the help of credit reference bureaus (CRBs), deployment of effective risk identification mechanisms, checklist analysis, business plan analysis, and valuation of

collateral.

Cooperatives play a significant role in the agricultural sector of many economies, especially the developing ones (Bizikova et al., 2025). Agricultural cooperatives refer to organisations that are owned by members where farmers pool resources collectively and exploit collective bargaining power to improve their productivity, minimise operational costs, enhance livelihoods, and ensure the economic stability of their members (Sacchetti & Tortia, 2021). According to a study by the Food and Agriculture Organisation (2024), the global primary crop production reached an estimated 9.9 billion tonnes in 2023, representing a growth of 28% from 2010 owing to the adoption of improved production technologies and more intense cultivation activities. A study by the Kenya National Bureau of Statistics (KNBS) in 2020 indicates that agriculture contributes 34% to Kenya's gross domestic product (GDP) and comprises 11% of the working force. Research carried out by the Alliance for a Green Revolution in Africa (AGRA, 2019) indicated that the majority of agricultural production is generated by small-scale farmers cultivating less than three acres of land. Notwithstanding the significance of this industry, just 4% of bank credit is allocated to it.

Agricultural cooperatives are usually amongst the key drivers of agricultural production, especially for smallholder farmers in developing and transitional economies by providing extension services to their members, facilitating the enhancement of farmers' yields and ensuring improved standards (Food and Agriculture Organisation, 2021). Cooperatives provided direct and indirect employment opportunities to an estimated 10 percent of the global population in 2017 (FAO, 2021). According to a report by the Kenya National Bureau of Statistics (2024), the agricultural sector accounted for 21.8 percent of the country's Gross Domestic Product (GDP) and was responsible for the employment of 40 percent of the total population. Additionally, the Gross Value Added (GVA) for the agricultural, forestry and fisheries sector amounted to KES. 3,295.2 billion while the production amounted to 10.7 million tonnes in 2023. The report also found that agricultural cooperatives contributed significantly to the coffee sub-sector with cooperatives being responsible for the production of 34.5 thousand tonnes out of a total 48.7 thousand tonnes of coffee in the 2022/2023 financial year.

Credit risk management is a critical aspect of the operations of deposit taking institutions over the world (Obondy et al., 2025). Agricultural cooperatives in Indonesia have

prioritised building resilience against risks through the integration of credit management practices such as the use of strong risk management frameworks, conducting training of their members on financial literacy and risk management methods, and engaging employees in decision-making processes pertaining to risk management (Ningsih et al., 2025). Savings and credit cooperatives in Nigeria have employed the use of various credit risk management practices including credit risk monitoring, credit risk identification, and credit risk control practices (Olorunsola et al., 2023). Credit risk management amongst deposit taking savings and credit cooperatives in Kenya include credit risk identification, credit analysis, credit monitoring, and credit mitigation (Ochieng, 2021). Additionally, these organisations employ the use of credit appraisal, credit collection, and credit risk governance practices (Mwangi et al., 2021).

Agricultural cooperatives in Kenya face significant credit risk management challenges, primarily driven by high loan default rates, inadequate credit assessment, weak governance, and poor record-keeping; these issues are compounded by reliance on agriculture, which is prone to weather risks, leading to high non-performing loans (NPLs) (Maina & Njeru, 2023). Information asymmetry is another challenge since there is a lack of reliable credit history and financial documentation for farmers which makes it difficult for the accurate assessment of credit worthiness (Bowen & Makokha, 2021). Extreme weather, climate change, and price volatility for agricultural products significantly impact members' ability to repay, creating inherent risk (Kipkosgei et al., 2026). Additionally, many cooperatives lack modern digital tools for tracking, analysing, and mitigating credit risks effectively (Obondy et al., 2025).

The aforementioned credit risk management significantly impact small-scale farmers, cooperative management/boards, financial lenders (like Agricultural Finance Corporation), and the rural economy. These issues limit credit access, lower financial performance, cause loan defaults, and stifle investment in agricultural inputs (Gitau, 2019). Small-scale farmers are the primary stakeholders who experience reduced access to loans, limited ability to purchase farm inputs (seeds, fertilizers), lower income, and reduced investment in agricultural diversification (Langyintuo, 2020). Cooperative management and boards face severe pressure from high NPLs, mismanagement accusations, poor liquidity, and the need to manage daily operations with limited funds (Kakai & Jagongo, 2024).

Agricultural cooperatives have been facing declining market share from an estimated 70%

in 2017 to 40% in 2025, particularly in sectors such as dairy and coffee (Kenya Economic Survey, 2025). Furthermore, despite 42% of the members of SACCOs in Kenya belonging to the agricultural sector, agricultural lending was a paltry 16.96% of the total SACCO loans in 2024 which has dampened the performance of agricultural cooperatives in the country as a result (Financial Sector Deepening, 2025). Due to poor operational performance, employees may face job insecurity, delayed salaries, or lack of resources to perform their roles (Njora & Ndegwa, 2020). As cooperatives struggle to pay for supplies or provide credit, the entire agricultural supply chain experiences reduced turnover (Bizikova et al., 2025). Finally, the cooperatives regulator faces challenges in ensuring compliance, as poor credit management slows down the contribution of cooperatives to national food security and poverty alleviation (Ishak et al., 2025). Thus, this study seeks address these challenges by providing a more nuanced understanding of causes, mitigation actions taken, and recommendations on how to enhance the situation amongst agricultural cooperatives in the Nairobi Metropolitan Area.

1.1.1 Performance of Agricultural Cooperatives

According to a survey by the CBK (2025), agricultural cooperatives in Kenya play a critical role, with the broader cooperative movement contributing over 30% to the national GDP and involving 63% of the population. While historically strong, recent data (2017–2022) indicates a performance decline, with average annual revenue growth of 5%–6% and net profit margins of 3%–4%. Only 3.63% of surveyed agricultural cooperatives are considered fully financially sustainable, with many facing management challenges, decreased market share, and high rates of dormancy. The same survey by the CBK (2025) found that agricultural cooperatives were responsible for the provision of 8% of the credit needs for farmers in Kenya in November 2024, however, this dropped to 2% in January 2025 indicating that the majority of farmers were accessing credit through bank credit providers. A report by the Kenya National Bureau of Statistics (2019), the majority of agricultural cooperatives in Kenya experienced of less than 2% and negative growth between 2015 and 2018.

The first indicator of performance of agricultural cooperatives is improved access to credit. Access to credit is defined as an individual's and organisation's capability to obtain financial services such as loans and other types of credit from both formal and informal financial institutions (Linarelli, 2021). Onah et al. (2024) affirmed that Nigerian farmers

with superior access to credit experienced enhanced financial performance relative to those that had poorer access to credit through such indicators as return on investment, net profit, working capital, sales and profit margin. Thus, access to credit was a prerequisite for better performance. According to Mpirwa (2022), access to credit and improved technical efficiency of farmers enabled improved coffee production in Rwanda showing that these were strong indicators of performance. Mwanyika and Koori (2020) examined the relationship between credit accessibility and performance of small-scale farmers in Taita Taveta County, Kenya and determined that timely availability of credit was associated with improved financial performance of farmers given that it enabled the purchase of required inputs and farm machinery that were essential for production.

The second indicator of performance of agricultural cooperatives is enhanced market access. Market access refers to the extent to which individuals are able to reach the targeted buyers so as to sell their products or services (Reed, 2023). Ma et al. (2024) conducted a study on the linkage of farmers to markets through agricultural cooperatives in Asia and found that agricultural cooperatives ensure the provision of collective bargaining power to assist farmers in achieving higher sales volumes, negotiating for better prices, and transaction terms that are more favourable to farmers. Consequently, these farmers are able to improve the performance of their farms and the cooperatives are able to grow their membership.

Yobe et al. (2024) examined the determinants of market choice among agricultural cooperatives in South Africa and established that market choice was predicated on the investment in training programs in aspects such as financial management, accounting and bookkeeping, and corporate governance. Thus, the skills and knowledge gained enabled the staff to perform much better in selecting appropriate markets for the cooperatives. Onyango et al. (2023) investigated the impact of cooperatives on small holder dairy farmers' income in Kenya. The study affirmed that cooperatives that were able to improve the proximity of farmers to markets through the establishment of policies that enhanced cooperative market participation led to improved sales which translated to higher incomes for the farmers.

The third indicator of performance of agricultural cooperatives is the level of sustainability. Sustainability is defined as the determination of the extent to which an organisation is able to achieve its present objectives without compromising the ability of

others to meet their future needs, through the maintenance of a suitable balance between environmental, economic and social components of their operations (Ruggerio, 2021). Cervantes et al. (2023) carried out a study on sustainability of agricultural cooperatives and found that through the adoption of a community-oriented approach and unique organisational structures these cooperatives are able to promote the sustainability of smallholder farmers in rural areas.

A study by Nji and Engwali (2020) on determinants of success and sustainability of farmer organisations in the North West Region of Cameroon posited that cooperatives have had to collaborate with NGOs in the agricultural sector in the provision of financial and technical assistance which has enhanced their sustainability. Ingutia and Sumelius (2024) carried out a study on family planning, irrigation and agricultural cooperatives for sustainable food security in Kenya and determined that cooperatives have been able to ensure the sustainability of smallholder farmers through the provision of training in sustainable agricultural practices.

The research on performance of agricultural cooperatives had a number of knowledge gaps. There were several studies which had different research designs, which represents a methodological gap which negates the attainment of the current study objectives by lowering the accuracy and validation of these research designs. These included Ma et al. (2024) who applied a thematic narrative research design, Yobe et al. (2024) who utilised an exploratory research design, and Cervantes et al. (2023) who applied a thematic narrative research design. Other studies used completely different theoretical frameworks which signifies theoretical gaps, which diminish the alignment between the conceptual frameworks of these studies and the current study's research objectives. These included Mpirwa (2022) who applied the Permanent Income model, Upward Sloping Credit Supply, and Productivity theory; Mwanyika and Koori (2020) who used the trade-off theory of capital structure, the theory of Information Asymmetry, Adverse Selection Theory, the Pecking Order Theory, and the Demand and Supply Theory; and Ingutia and Sumelius (2024) which was anchored by the Stakeholder theory.

There were studies which were conducted in foreign jurisdictions which represented contextual gaps given the different operational characteristics of other geographical jurisdictions. These include Onah et al. (2024) which was conducted in Nigeria; Mpirwa (2022) which was carried out in Rwanda; and Yobe et al. (2024) which was conducted in

South Africa. Some studies on performance of agricultural cooperatives were not focused on credit risk management practices which represent conceptual gaps. These included Ma et al. (2024), Onyango et al. (2023), and Engwali (2020). This study seeks to address these gaps by basing the study on Credit Risk Theory, Credit Rationing Theory and Information Asymmetry Theory; a positivist research philosophy and descriptive design; and a focus on the confluence between credit risk management practices, operational performance of agricultural cooperatives, and firm size in Kenya.

1.1.2 Credit Risk Management Processes

Risk management is a methodical process designed to detect, evaluate, and prioritize risks, thereafter followed by coordinated efforts to reduce, track, and manage the probability or effects of unfavourable events (Hamilton, 2020). The rapidly changing global agricultural landscape has exposed agricultural cooperatives to a number of risks that have adversely affected their profitability and the resilience of their farmer members such as price volatility, market uncertainties, policy changes, which have all threatened the growth and sustainability of agricultural cooperatives (Ali & Kutan, 2022).

Qian and Olsen (2021) identified a number of key credit risk management practices that have been employed by agricultural cooperatives in New Zealand including diversification of crops, adoption of crop insurance, and price risk hedging. Pokharel et al. (2020) established that in order for agricultural cooperatives in the Netherlands, Italy and Finland to control their exposure to credit risks, they opted to consolidate with others so as to enjoy economies of scale and enhance their equity structure.

Balana and Oyeyemi (2022) determined that proactive initiatives to enhance the capacity of smallholder farmers in Nigeria to possess bankable collateral acted as a driver of improved access and utilisation of rural credit. Additionally, this simultaneously ensured better credit risk management of the agricultural cooperatives that these farmers belonged to. Nomonde and Mzuyanda (2025) found that one of the most effective credit risk mitigation strategies employed by agricultural cooperatives in South Africa was the establishment of credit guarantee schemes in collaboration with financial institutions.

Njeri (2021) established that the use of debt management through the reduction of the number days of accounts receivable was an effective credit management strategy employed by dairy cooperatives in Kenya. Amunabi and Koori (2018) ascertained that the

majority of the Kenyan cooperatives had adopted credit risk appraisal techniques but failed to do the same for credit risk mitigation, credit risk identification, and credit risk policies, which had hampered the overall credit risk management effort.

The literature on credit risk management had several research gaps. Many studies were conducted in foreign jurisdictions which represent contextual gaps given the different operational characteristics of different jurisdictions. These included Balana and Oyeyemi (2022) which was conducted in Nigeria, Qian and Olsen (2021) which was conducted in New Zealand, and Nomonde and Mzuyanda (2025) which was conducted in South Africa. There were studies which used different research designs which represented methodological gaps which negates the attainment of the current study objectives by lowering the accuracy and validation of these research designs. These included Qian and Olsen (2020) which applied an explanatory research design, and Pokharel et al. (2020) applied an empirical literature review research design. This study seeks to address these gaps by basing the study on Credit Risk Theory, Credit Rationing Theory and Information Asymmetry Theory; a positivist research philosophy and descriptive design; and a focus on the confluence between credit risk management practices, operational performance of agricultural cooperatives, and firm size in Kenya.

1.1.3 Firm Size

Firm size is a relative classification of the scale and operating capacity of an organisation using metrics such as market capitalisation, total assets, number of employees, and total sales (Hashmi et al., 2020). Firm size influences cooperatives' performance by increasing the economies of scale and access to resources for larger organisations, while enhancing the flexibility, agility, resource utilisation and specialisation for smaller ones (Pokharel et al., 2020).

Pokharel et al. (2020) established that smaller Malaysian cooperatives that were diversified were more inclined to have less variation in financial performance than larger ones. Liang et al. (2023) found that membership size as a proxy of organisational size was more impactful on the profitability of Chinese cooperatives. Junior and Wanda (2021) investigated factors that determined the success of agricultural cooperatives in Brazil and affirmed that small and medium sized organisations tended to have the right blend of resource availability and the diffusion of technology into their operations relative to larger

ones.

Nimusiima et al. (2021) found that integrated cooperatives in Uganda were able to produce more and provide larger loans to their members than single ones making them more effective in terms of benefitting the farmers. Uwaramutse et al. (2022) established that the amount of liquidity, the number of employees, the value of the total assets and share capital were all significantly and positively associated with the financial performance of Irish potato farmer cooperatives in northern and western provinces in Rwanda.

Kimetto (2018) ascertained that larger firms in Kenya had increased negotiation power and, therefore reduced average financial costs. Additionally, the larger firms were better able to diversify so as to ensure the control of capital costs. Karuiki (2024) studied the controlling effect of firm size on the nexus between and firm value in the context of savings and credit cooperatives in Kenya and did not find a significant controlling effect of firm size on the relationship between interest rate risk and firm value.

The literature on firm size had a number of knowledge gaps. A number of the studies were not focused on credit risk management practices which represents a conceptual gap. These included Kimetto (2018) which focused on the determinants of financial performance of agricultural societies; Karuiki (2024) focused on firm value; and Uwaramutse et al. (2022) focused on cooperative characteristics. A number of studies were also carried out in foreign jurisdictions which represents a contextual gap given the different operational circumstances of those countries relative to Kenya. These included Uwaramutse et al. (2022) which was conducted in Rwanda; Junior and Wanda (2021) which was conducted in Brazil; and Pokharel et al. (2020) which was conducted in Malaysia. There were some studies which applied different research designs which represented methodological gaps which negates the attainment of the current study objectives by lowering the accuracy and validation of these research designs. These included Junior and Wander (2021) which used an empirical literature research design; Liang et al. (2023) which conducted a longitudinal research design; and Nimusiima et al. (2021) which carried out an explanatory research design. This study seeks to address these gaps by basing the study on Credit Risk Theory, Credit Rationing Theory and Information Asymmetry Theory; a positivist research philosophy and descriptive design; and a focus on the confluence between credit risk management practices, operational performance of agricultural cooperatives, and firm size in Kenya.

1.1.4 Agricultural Cooperatives in Kenya

According to the National Cooperatives Register (2017), as of the end of 2017, there were 22,344 registered formal and informal cooperatives in Kenya, cutting across all sectors of the economy. The total mobilized savings of these cooperatives was valued at KES. 730 billion, the value of loans and advances to members was KES. 700 billion, while the total value of controlled assets stood at KES. 1 trillion. A national report by the International Cooperative Alliance – Africa (2020) indicated that there was a total of 5,281 active cooperatives in Kenya in 2019, of which 1,295 were agricultural in nature. The breakdown of these agricultural cooperatives per activity included 368 involved in coffee, 438 involved in dairy activities, 54 in fishing, 96 in horticulture, 96 in beekeeping, 149 in cereals, 32 in legumes, 12 in tea, 26 in cotton, and 24 in pyrethrum.

A report by the Ministry of Agriculture, Livestock, Fisheries and Cooperatives (2019) found that agricultural cooperatives have faced a number of performance challenges including poor marketing channels for produce, delayed payments to farmers, poor supply of farm inputs, inadequate access to credit, general managerial incompetence, and an inadequate level of value addition. These challenges have contributed to a general stagnation in growth and development of these organisations.

1.2 Statement of the Problem

Agriculture remains the pillar of Kenya's economy, contributing significantly to employment, food security and rural development. According to a survey done by the Central Bank of Kenya (2023), the agricultural sector continues to play a vital role in Kenya accounting for about 20 percent of GDP. This notwithstanding, the sector continued to experience high transportation costs and input prices which adversely affected the output and prices of principal food items in 2023. As far as agricultural cooperatives are concerned, challenges include limited capacity to deal with all the issues faced by small-scale farmers, and the lack of involvement of the youth agricultural activities with average age of farmers being 60 which had translated to low membership of the cooperatives (Balongo, 2024). Additionally, the high levels of competition amongst agricultural cooperatives have compelled them to offer credit to low-income earners who end up defaulting, which has heightened these institutions' credit risk exposure (Aduda & Obondy, 2021).

According to a survey by the CBK (2025), only 3.63% of surveyed agricultural cooperatives were considered fully financially sustainable, with many facing management challenges, decreased market share, and high rates of dormancy. Access to credit has remained a persistent issue for both lenders and regular cooperative members due to lack of adequate collateral, illiteracy of farmers, high interest rates, and lack of capital for the lending cooperatives (Ingutia & Sumelius, 2024). Furthermore, agricultural cooperatives in Kenya are unable to perform optimally owing to inadequate training, poor management and leadership, and lack of preparedness in dealing with the aforementioned credit risk management challenges (Njeri, 2021). The performance of agricultural cooperatives is also adversely affected by the lack of involvement by the youth owing to the stigma attached to these cooperatives which had increased their unpopularity amongst this critical cohort (Mawia, 2023). Additionally, the low production levels of many farmers have lowered the revenues of agricultural cooperatives and hampered their credit risk management efforts since they are unable to access adequate financial resources to invest in appropriate credit risk management practices (Kimetto & Kimani, 2018).

Despite the recognition of credit risk as a barrier to financing, there is a paucity of empirical studies focusing on the effectiveness of credit risk management processes specifically tailored to agricultural cooperatives in Kenya. Kemunto et al. (2020), Nderitu (2022), and Aduda and Obondy (2021) were all contextualised-on deposit taking savings and credit cooperatives in general rather than on agricultural cooperatives in particular, which represents a contextual gap. Some studies such as Wambua et al. (2024), Sebhatu et al. (2021), and Dhakal et al. (2021) were contextualised on agricultural cooperatives but failed to focus on credit risk management processes which represents a conceptual gap. There were works such as Wambua et al. (2024), Kemunto et al. (2020), and Aduda and Obondy (2021), which applied different research designs other than the present study's descriptive research design, which represents a methodological gap which negates the attainment of the current study objectives by lowering the accuracy and validation of these research designs. This study, therefore, addresses this inaccuracy and provides the needed validation through the use of the combination of the positivism philosophy and the correlational research design. These gaps underscore the need for research that evaluates how credit risk management processes can be optimized to enhance agricultural financing.

1.3 Research Objectives

The study will be guided by both the general objective and specific objectives.

1.3.1 General objective

The general objective of this study was to examine the effect of credit risk management processes and the operational performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size.

1.3.2 Specific objective

- i. To establish the effect of credit risk assessment on the performance of agricultural cooperatives in Kenya.
- ii. To determine the effect of credit risk monitoring on the performance of agricultural cooperatives in Kenya.
- iii. To examine the effect of credit risk identification on the performance of agricultural cooperatives in Kenya.
- iv. To establish the effect of credit risk control on the performance of agricultural cooperatives in Kenya.
- v. To ascertain the moderating effect of firm size on the relationship between credit risk management processes and the performance of agricultural cooperatives in Kenya.

1.4 Research Questions

- i. How does credit risk assessment affect the performance of agricultural cooperatives in Kenya?”
- ii. What effect does credit monitoring have on the performance of agricultural cooperatives in Kenya?
- iii. How does credit risk identification affect the performance of agricultural cooperatives in Kenya?
- iv. What effect does credit risk control have on the performance of agricultural cooperatives in Kenya?
- v. What is the moderating effect of firm size on the relationship between credit risk management processes and the performance of agricultural cooperatives in Kenya?

1.5 Scope of the study

The study sought to investigate the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size. The population of interest in this study was 40 agricultural cooperatives registered and active in the Nairobi Metropolitan area in Kenya that features Nairobi, Kiambu, Machakos, Kajiado and Murang'a counties. This comprised the study's unit of analysis. Primary data was collected from 120 individuals (3 individuals per cooperative), which comprised the study's unit of observation. The study examined the relationship between each of four credit risk management practices, namely, credit risk assessment, credit risk monitoring, credit risk identification, and credit risk control, and performance. Additionally, it examined the moderating effect of firm size on this relationship. It was conducted over a four-month period between October 2025 and January 2026.

1.6 Significance of the Study

The findings of this paper will be significant to the government, particularly the Ministry of Agriculture and central bank, agricultural cooperatives, researchers with interest on the correlation between credit risk management processes and performance of agricultural cooperatives. Particularly in the Kenyan context as explained below.

1.6.1 Government Agencies

The government relies on agriculture to grow its economy and access to credit enables the country to grow its GDP. This research will assist policymakers, and the regulator, by serving as a reference for formulating suitable regulations that enable agricultural cooperatives in managing credit risk, hence enhancing return on assets and improving performance.

1.6.2 Agricultural Cooperatives

To the agricultural cooperatives, the study will provide comparative information on the effectiveness of Credit Risk Management Processes in improving their performance. The study will provide recommendations to the agricultural cooperatives on the specific credit risk management processes that they should adopt to improve performance. This study will also provide insights as to how firm size can moderate the relationship between credit risk management processes and performance so that proprietors of agricultural cooperatives can apply the same in trying to grow their institutions.

1.6.3 Academicians

The role of agriculture in an economy cannot be underestimated. Given the scarcity of research on the underlying study variables in particular, the results will be very significant to scholars, especially those in Kenya.

1.7 Chapter Summary

This chapter starts with the background information on the role of agriculture. In the first part, the chapter presents an overview of agriculture. It also discusses its importance and challenges, credit risk management practices, problem statement, next the chapter outlines the research objectives and questions to emphasize the core purpose of the study and lastly it states the scope and the significance of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presents theoretical review underpinning the study as well as empirical literature on the role of credit risk management on agricultural cooperatives. Section 2.2 addresses the theoretical framework, in which is the foundational theory grounding this research; the theory of Credit risk, credit rationing and information asymmetry is used and its choice justified. Section 2.3 conducts a critical analysis of the current empirical research on the subject. Section 2.4 delineates the research gap found in the literature review. Ultimately, section 2.5 serves as the conceptual basis for the investigation.

2.2 Theoretical Review

The study is anchored on the following theories; Credit Risk Theory, Credit Rationing Theory and Information Asymmetry.

2.2.1 Credit Risk Theory

This theory, which was advanced by Robert Merton in 1974, posited that lenders and financial institutions face the risk of borrowers defaulting on their obligations, and it provides a framework for assessing, managing, and mitigating this risk. It emphasizes key components such as the probability of default (PD), loss given default (LGD), and exposure at default (EAD) to quantify potential losses (Adegbe & Otitolaiye, 2020). The theory is supported by various models, including credit scoring techniques, structural models like Merton's Model, and reduced-form models that use market data to estimate default risk. By applying these principles, financial institutions can price loans appropriately, implement risk mitigation strategies, and comply with regulatory frameworks like the Basel Accords to ensure financial stability (Tran et al., 2021).

According to Bilal and Baig (2019), the theory identifies three main credit risks including nonfinancial risk, financial risk, and hazard or pure risk. Additionally, there are other financial risks such as foreign exchange, credit, liquidity, interest rate, market, solvency, and capital adequacy hazards. It should be noted that the nonfinancial risks are considered operational risks. Credit theory is delineated as a four-stage risk evaluation procedure

including risk management comprehension, risk identification, risk assessment, and risk monitoring (Naili & Lahrichi, 2022). This theory is crucial to this research as it establishes the premise that every lending institution must formulate a credit risk measurement strategy to facilitate the identification, evaluation, monitoring, and management of credit risk, hence enhancing agricultural finance.

Credit Risk Theory is based on several key assumptions that help assess the probability of a borrower's debt default. Bouteille and Coogan-Pushner (2021) posited that the theory assumes that borrowers have varying levels of creditworthiness, which can be evaluated using financial data, historical payment behaviour, and market conditions. Huang and Zhou (2020) added that the theory assumes that credit risk is influenced by both idiosyncratic (borrower-specific) and systemic (market-wide) factors, meaning economic downturns or financial crises can increase default rates. According to Prastiwi and Anik (2020), the theory presumes that financial institutions can mitigate risk through diversification, collateral, and credit enhancement mechanisms like guarantees or insurance. Furthermore, Kwashie et al. (2020) affirmed that the theory assumes that credit risk can be quantified using statistical models, allowing lenders to assign probabilities to default events.

Critics of Credit Risk Theory argue that its assumptions often fail in real-world applications, leading to inaccurate risk assessments. One major criticism is its reliance on historical data and statistical models, which may not capture unexpected economic shocks or black swan events, such as financial crises (Çallı & Coşkun, 2021). Additionally, the theory's assumption that credit risk can be quantified objectively was found to be defective since creditworthiness assessments are often influenced by subjective judgment and biases (Fonseca et al., 2020). Bouteille and Coogan-Pushner (2021) also argued that the problem of information asymmetry, where borrowers may hide financial distress, makes risk models unreliable. Moreover, the assumption that diversification and collateral can always mitigate credit risk is flawed, as systemic crises can render these safeguards ineffective.

Credit Risk Theory is widely applied in credit risk assessment by financial institutions including agricultural cooperatives to evaluate the likelihood of borrower default and manage financial stability. Agricultural cooperatives can use this theory to develop appropriate credit monitoring techniques that ensure review and follow-up for suitable corrective action whenever issues arise during the credit repayment process. The theory

also enabled the identification of existing and potential risks in an agricultural cooperative's loan products and associated lending activities. Finally, agricultural cooperatives can also use the theory to develop comprehensive risk management policies, implement robust internal controls, diversify their activities, and form audit committees in order to ensure credit risk control. Firm size acts as a key moderator between credit risk and the performance of MFIs, with larger institutions better equipped to manage risks and, consequently, experience higher profitability. Smaller MFIs often face higher default risks due to information asymmetry and a lack of collateral, reinforcing the need for tailored credit risk management.

2.2.2 Credit Rationing Theory

The theory which was introduced by Freimer and Gordon (1965), and later supported by Stiglitz and Weiss (1981), held that persons who are dissatisfied are the ones that borrow money. Credit rationing occurs due to asymmetrical data, which hinders lenders from distinguishing between borrowers of varying quality (Emran et al., 2021). Accordingly, financial institutions ration credit as a means of influencing investment through expansion and contraction of loans (Gonzalez-Vega, 2021). Credit rationing can occur in the short term, when there is a temporary disequilibrium owing to an exogenous shock that causes some stickiness in the price of capital; or in the long-term, when the government experiences constraints such as usury laws (Miglo, 2022). However, this dominant viewpoint is still subject to critique. De Paola (2022) argued that in credit markets, asymmetric knowledge may result in an excessive provision of credit, which is sometimes referred to as excess lending. Banks are founded because of their greater capacity to investigate and monitor borrowers in comparison to other investors, as such, they have a high level of proficiency in gathering sensitive information and effectively overseeing its management.

The idea posited by the theory is that the presence of moral hazard, wherein borrowers may engage in too much risk or adopt behaviours that heighten the probability of default after acquiring credit, leads lenders to express apprehensions regarding the activities of debtors subsequent to the disbursement of monies (McNamara et al., 2020). Kallandranis et al. (2023) claim that credit rationing theory frequently functions within the framework of imperfect competition in the loan market. This implies the absence of a marketplace that is totally profitable, where information is readily accessible and lenders compete

exclusively based on interest rates. Both borrowers and lenders are presumed to have a preference for avoiding risk. Lenders are apprehensive about the possibility of borrowers failing to repay their loans, while borrowers are anxious about the possible adverse effects of borrowing, such as financial hardship or the loss of assets used as security.

Nguyen (2021) criticized this idea by pointing out that banks have informational asymmetries, which hinder the loan market from reaching equilibrium through the adjustment of prices, particularly interest rates. In the end, a condition of equilibrium arises, along with a faction of discontented individuals on the periphery. Andreas (2021) asserted that equilibrium rationing, in contrast to other types of credit restriction, makes assumptions that are too simplistic and fail to correctly depict the intricacies of the real world.

Credit Rationing Theory is linked to the research objectives in a number of ways. In order to determine how to ration the credit, an organisation must conduct credit risk assessment, then follow on with the credit risk identification, and once the credit has been offered it must conduct credit risk monitoring and credit risk control. Thus, the entire process of credit risk management is informed by the theory. More specifically, the lending institutions are compelled to assess borrowers' discernible characteristics and loan characteristics before deciding on whether or not to advance credit. Upon completion of the credit risk assessment, risks will need to be identified and a determination made on their magnitude. Credit risk monitoring and credit risk control will only be conducted if the credit has been advanced.

The linkage between credit rationing and the firm size of MFIs revolves around how the scale of the MFI affects its ability to manage information asymmetry and, consequently, its exposure to default risk, which moderates its performance. Larger MFIs are generally better placed to manage credit risk compared to smaller ones. Their size allows for more robust credit assessment tools, reducing the information asymmetry that causes rationing.

2.2.3 Information Asymmetry Theory

The information asymmetry theory, which was originated in 1970 by Akerlof, arose when relevant data was not evenly distributed among all those involved in a certain undertaking (Chod & Lyandres, 2021). Accordingly, market inefficiency and risk-taking result from information asymmetry, due to the continued inadequacy, inaccuracy, and incompleteness of the provided information (Liu et al., 2021). Thus, owing to the prevalence of

information asymmetry, issues such as moral hazard and adverse selection arise, where the former refers to the change in one party's actions or behaviour in the aftermath of a transaction, while the latter relates to the difficulty experienced by buyers in distinguishing good products from bad ones (Vosooghizadeh et al., 2020). Essentially, the theory argues that the presence of asymmetric information forces buyers to buy goods that may be of substandard quality since they appear to be of high quality, which leads to high-risk individuals making purchases at the expense of low-risk ones (Kim & Park, 2023).

Baisero and Amato (2021) challenged this notion, arguing that asymmetry in knowledge might lead to credit rationing, when specific applicants are unfairly denied loans. This occurrence occurs because a higher interest rate worsens the issue of adverse selection. Some argue that models relying on information asymmetry assume that in a transaction, one party has important knowledge while the other party or parties do not have that information. Naqvi et al. (2021) argued that it oversimplifies real-world economic interactions and does not fully account for mechanisms that reduce information gaps. Adhikari and Zhou (2022) disagreed with the theory's assumption of a persistent imbalance of knowledge between parties, overlooking the significance of technological progress, regulatory frameworks, and market institutions in improving transparency. Additionally, Sapindi et al. (2023) pointed out that the theory often assumes rational behaviour, ignoring the impact of biases, emotions, and strategic manipulation, where both parties may withhold or distort information for personal gain. Furthermore, Pernkopf et al. (2021) established that in some cases, excessive transparency can lead to adverse effects, such as hoarding behaviour in financial markets, where investors overreact to publicly available information, causing volatility.

Information Asymmetry Theory applies to credit risk management processes in agricultural cooperatives by highlighting the imbalance of information between borrowers and lenders. Borrowers typically have more knowledge about their financial status and ability to repay loans than banks do, which can lead to adverse selection and moral hazard. In credit risk management, this asymmetry means that some borrowers may conceal financial difficulties or misrepresent their ability to repay, increasing default risks. To mitigate these challenges, agricultural cooperatives use credit assessment tools, credit risk monitoring, credit risk identification, and credit risk control to bridge the information gap.

Information asymmetry theory suggests that Kenyan agricultural cooperatives face high

credit risk due to the "lemon problem," where borrowers have more information about their repayment capacity than the lender, leading to adverse selection and moral hazard. Relationship-based credit risk assessment—which involves leveraging the close ties, shared information, and social cohesion within the cooperative—acts as a mechanism to mitigate this asymmetry. By reducing information gaps, this approach improves loan performance, reduces non-performing loans (NPLs), and enhances the financial sustainability of the cooperative. The linkage between Information Asymmetry Theory, credit risk monitoring, and the performance of Kenyan agricultural cooperatives is a critical, multi-faceted relationship centred on managing risk in an environment where lenders often have less information than borrowers. Information asymmetry—where borrowers (smallholder farmers in the Nairobi Metropolitan Area) know more about their risk than lenders (cooperatives)—causes adverse selection (screening poor risks) and moral hazard (monitoring behaviour).

The inability to accurately identify risk requires cooperatives to invest in screening, such as using credit reference bureaus (CRBs) to access past repayment behaviour, reducing "lemon" loans. Collateral is traditionally used to mitigate information problems. However, in agricultural settings where assets are hard to value, social capital (group lending, mutual monitoring) is used to bridge the information gap, allowing members to monitor each other, which reduces default rates. Information asymmetry theory provides the foundational framework for understanding why credit risk control is critical for the performance of agricultural cooperatives in the Nairobi Metropolitan Area. In this context, information asymmetry—where borrowers (farmers) possess more information about their risks, project viability, and true financial position than lenders (the cooperative)—leads to adverse selection and moral hazard, resulting in increased NPLs and diminished performance. The linkage between Information Asymmetry Theory and the firm size of MFIs is central to their operational strategy, focusing on how MFI size affects their ability to screen borrowers and monitor loans. Information asymmetry—where borrowers know more about their risk profile than lenders—causes adverse selection and moral hazard, which smaller, poorer borrowers often cannot mitigate through traditional collateral.

2.3 Empirical Review

The literature covers global aspects, regional, regionally in East Africa, and locally in Kenya. This section aims to evaluate the efficacy of credit risk assessment, credit risk

monitoring, credit risk identification and credit risk control on the performance of agricultural cooperatives.

2.3.1 Credit Risk Assessment and Performance

Brahmaiah (2022) examined credit risk assessment practices of the Indian banking industry: An empirical study. This research was based on Moral Hazard Theory as well as Duffie-Singleton Model. The study employed a quantitative research design, focusing on empirical analysis of credit risk management processes in Indian commercial banks. The research targeted the Indian banking industry, specifically selecting a sample of twelve banks, comprising six largest public sector banks (PSBs) and six largest private sector banks (PVBs). This sample accounted for approximately 78% of the country's banking business during the study period. Secondary data were utilized, found from the annual reports of a five-year period over selected banks, from 2016 to 2021. Results showed that scheduled commercial banks (SCBs) in India encounter credit risk, market risk, and operational risk. The credit risk management methods studied included risk identification, assessment, analysis, evaluation, monitoring, and control. Notably, private sector banks demonstrated better credit risk management practices by use of credit score and credit history compared to public sector banks, with PSBs exhibiting higher non-performing assets (NPAs) and lower profitability ratios during the study period.

This was aligned with the findings of Ogundele and Nzama (2025) but contrasted with those of Solanki et al. (2023) who determined that whilst the risk assessment was necessary, it was more important for the banks to measure the risks and prepare a risk profile. The strengths of the study include: the representative sample comprising 78% of the target population; and the inclusion of different types of risk as well as credit risk management practices. The study had a number of knowledge gaps which also represented areas of weakness including: a contextual void since it concentrated on India's banking industry, where credit risk assessment is shaped by a highly diversified economy, strong banking regulations, and industrial financing priorities; the lack of focus on agricultural cooperatives was also a contextual gap given the different operational conditions of other types of institutions relative to MFIs; whereas the lack of attention to performance as a dependent variable represented a conceptual gap since this study was investigated a completely different relationship.

Munangi and Sibindi (2020) examined the influence of credit risk assessment on South African banks' financial performance. The study utilized an explanatory research design aided by Adverse Selection Theory and Moral Hazard Theory. It examined 18 South African banks active from 2008 to 2018, although the criteria for their selection were not clearly defined. Secondary data were sourced from the annual reports and financial statements of these banks for the specified period. According to the results, there was a significant but negative association between credit risk, as indicated by the non-performing loans ratio, and bank financial performance, represented by return on assets (ROA). Thus, increased credit risk detrimentally impacts the profitability of South African banks. This was aligned with the findings of Evoney and Margaretha (2024).

In contrast, Al Zaidanin and Al Zaidanin (2021) found that credit assessment techniques such as analysis of clients' credit history need to be conducted by banks on a continuous basis in order to enhance their financial performance. The strengths of the study include: the extensive literature review which speaks to the depth of research; the focus on bank size as a moderating variable; the appropriateness of the research design; and the ten-year period of study. The knowledge gaps include: a methodological gap since the study employed panel data analysis over a decade (2008-2018) to weigh the influence of credit risk on financial performance, but the present used research cross-sectional data or shorter time spans, thus overlooking long-term patterns; the geographical setting of South Africa as well as the concentration on banks rather than agricultural cooperatives signifies gaps of a contextual nature given the different operational conditions of both the different country and mainstream banks; and the different theoretical framework which signifies a theoretical gap since this framework is inappropriate for the attainment of the present study's objectives.

An analysis of credit risk management and financial performance of commercial banks in Kenya was carried out by Imbuye and Miroga (2023). The study was anchored on the Credit Rationing Theory and adopted a descriptive survey design. The study examined 200 workers from 43 lawfully functioning commercial banks in Kenya, and collected secondary data using annual reports from 2018 to 2022. It specifically concentrated on five commercial banks, selecting a sample of 108 employees. These banks were chosen due to their prominence, long-standing presence in the financial market, and substantial customer base. The study employed purposive sampling to select the five banks and used census sampling to include all 108 employees from these banks. Primary data were

obtained using structured questionnaires. The data's dependability was evaluated by Cronbach's alpha to confirm internal consistency. The research demonstrated that financial performance of commercial banks is significantly impacted negatively by credit risk management. Specifically, effective credit risk management practices were associated with reduced non-performing assets and enhanced profitability.

This corroborated the findings of Owusu-Boafo et al. (2020). However, conversely, Gobbilla and Nandini (2025) posited that robust internal credit frameworks and technological tools were critical towards the reductions of non-performing loans and improving financial stability. The main strengths of the study included: the suitability of the theoretical framework and the analytical model. The study's focus on banks rather than agricultural cooperatives represents a contextual gap since banks face very different operational conditions relative to MFIs.

Kadima et al., (2022) delved into the nexus between credit risk management policies and Kenyan MFIs' financial performance. The study employed the Credit Spread Puzzle Model and Credit Risk Theory. The research utilized a descriptive survey methodology. Its unit of analysis comprised credit managers from all 52 MFIs operating in Kenya, as documented in the AMFI database. The survey's descriptive analysis revealed that Credit Risk Control positively influenced Financial Performance. In summary, the survey found that effective credit risk mitigation practices, such as rigorous client assessment and continuous monitoring, positively influence the economic performance of microfinance institutions. In particular, institutions with robust credit risk control mechanisms reported lower default rates and improved profitability.

This was consistent with the findings of Scott et al. (2024) but not with Sudi and Musiega (2020) who determined that the most effective credit risk mitigation practices for MFIs were the stabilisation of liquidity control measures and controlling loan default rates. The key strengths of the study were: the use of both descriptive and inferential statistical analyses; as well as the use of both primary and secondary data offered a more comprehensive approach and enhances accuracy through triangulation and validation of the findings. The study had a number of knowledge gaps including: the dissimilar theories which represents a theoretical gap given the inability of these theories to fulfil the present study's research objectives; and the setting of MFIs rather than agricultural cooperatives

which signifies a contextual gap since agricultural cooperatives operate under unique conditions relative to the other MFIs.

The research carried out by Okero and Waweru (2023) conducted an evaluation of credit risk and loan repayment within development finance institutions in Kenya by focusing on the Kenya Industrial Estates Limited. The study was supported by the Credit Risk and the Asymmetric Information theories. The researchers employed a descriptive research design. Employees of Kenya Industrial Estates Limited, a development financial institution in Kenya were targeted for inclusion. A purposive sampling technique was applied in the selection of 50 personnel engaged in credit risk assessment and loan management. Primary data were gathered by structured questionnaires sent to the chosen workers. The study revealed that effective credit risk assessment, particularly evaluating borrowers' character and capacity, significantly enhances loan repayment rates in developing financial institutions.

This was aligned with the findings of Obae and Jagongo (2022). Conversely, Mburu (2021) determined that the most critical aspect of credit risk management for organisations was the generation of adequate cash flows to enable borrowers to meet their loan repayment obligations. The study's key strengths are the well-articulated justification of the study owing to the dearth of research on development finance institutions; the extensive literature review; and the suitability of the data analysis model. The knowledge gaps of the study included: the case study research design which represented a methodological gap given its highly focused approach compared to the present study's broader approach; and the lack of focus on agricultural cooperatives which represents a contextual gap since agricultural cooperatives operate under unique conditions.

2.3.2 Credit Risk Monitoring and Performance

Credit risk monitoring refers to the process through which financial institutions continuously evaluate the risks pertaining to the provision of loans to individuals, businesses or entities (Koulouridi et al., 2020). A study was conducted by Kiprono and Njeru (2022) on the influence of credit risk monitoring on the growth of shareholders' wealth in deposit-taking Saccos in Nairobi City County. The theoretical framework comprised the Credit Risk Theory. The research design selected was descriptive and 42 licensed DT-SACCOs were included in the target population. Structured questionnaires were used to gather primary data from a sample of 118 employees from these SACCOs.

The results indicated that credit risk monitoring was positively and significantly associated with the growth of shareholders' wealth. This notwithstanding, some of the SACCOs had not incorporated the right computer credit risk monitoring solutions to ensure more effective and efficient credit risk monitoring.

This affirmed the findings of Scott et al. (2024). However, in contrast, Umeorah et al. (2024) found that most financial institutions had ensured the integration of modern credit risk monitoring techniques including machine learning which had made the process more precise and proactive. The main strengths of the study included: the use of 42 licensed DT-SACCOs which represents a large target population that ensures representative findings; and an extensive literature review. The study had a number of knowledge gaps including: the focus on DT-SACCOs in general rather than agricultural cooperatives in particular which signifies a gap that is contextual given the unique operational conditions of agricultural cooperatives; and the absence of a theoretical framework, which signifies a gap which is theoretical since it leads to a chaotic, directionless and less rigorous study.

Maina and Njeru (2023) carried out a study on how loan recovery performance of Kenyan digital credit lenders is affected by credit risk management practices. The study was supported by the Finance Distress, Credit Risk, Asymmetric Information and Portfolio theories. A descriptive survey research design was chosen, while all 32 registered digital lenders were included in the target population. Questionnaires were applied in the collection of primary data from a sample of 64 respondents. SPSS facilitated the inferential and descriptive statistical data analysis. The findings indicated that digitised credit risk monitoring aids had eased the process through which these lenders had been able to evaluate the collateral against the loan credit applied for, which consequently led to improved loan recovery performance.

This was consistent with the findings of Kiros (2022). However, Neelakanta et al. (2025) posited that the adoption of digital solutions to credit management by microfinance institutions has been hampered by poor digital infrastructure, lack of basic computer knowledge by the average customers, and regulatory limitations. The main strengths of the study included: the inclusion of digital credit lenders indicates the relevance and currency of the study; the focus on all 32 digital lenders speaks to the scope of coverage; and the well-articulated justification for the study. The study's knowledge gaps included: the focus on digital lenders rather than agricultural cooperatives, which epitomises a gap of contextual nature given the unique operational conditions of agricultural cooperatives;

and the dissimilar theories which fail to adequately explain the phenomenon of credit risk management and its impact on performance of MFIs.

Gitau (2021) studied the influence of credit management on financial performance of dairy marketing cooperatives in Kenya. The Financial Stewardship Theory underpinned the study. A descriptive panel research plan was applied and the target population was four dairy marketing cooperatives in Kisii, Nyamira, Bomet and Kericho counties. The study gathered secondary data from the four cooperatives using published annual statements for periods spanning 2009 to 2018. Data analysis was conducted using multiple panel regression. The results of the study showed that effective credit management ensured timely debt recovery which translated into improved return on investment for the cooperatives.

This was aligned with the findings of Makori (2023) but not with Ali and Ndede (2024) who established that preventive credit management techniques such as the integration of internal control systems and audits, management competency, and capital adequacy were all critical towards the improvement of financial performance. The key strengths of the study included: the focus on cooperatives in four counties which expanded the scope and provided more representative findings; and the ten-year study period which ensured enhanced depth, accuracy and causal analysis. The study had the following knowledge gaps: the different theories which epitomises a gap of a theoretical nature since these theories failed to adequately explain the influence of credit risk management practices on the performance of MFIs; whereas the concentration on four specific cooperatives instead of a more generalised assessment embodies a contextual gap since this narrows the scope.

Olajide (2024) examined the alignment of cooperative support services by cooperative thrift and credit societies in Nigeria. The Social Capital Theory underpinned the study. A mixed methods research design was selected and primary data was collected from 20 respondents in 4 cooperatives in Ibadan, Nigeria using structured questionnaires. The data was analysed using multinomial logistic regression. The results indicated that a number of cooperatives experienced challenges in their loan recovery strategies owing to the informal nature of some of the businesses invested by loan recipients and making it more difficult for them to boost their revenues and repay the loans.

This was aligned with the findings of Sikira et al. (2024). However, Onah et al. (2024) determined that thanks to the financial literacy initiatives undertaken by cooperative societies, the farmers had been able to improve their yields and generate sufficient incomes

to repay their loans, which in turn boosted the societies own financial performance. The suitability of mixed methods research design; the representativeness of the sampling procedure; as well as the analytical model were the main strengths of the study. The choice of Nigeria as the geographical setting embodies a gap of contextual nature given the different operational circumstances of Nigeria relative to Kenya; whereas the different theories signify a gap of theoretical type since these theories fail to adequately explain the influence of credit risk management practices in the performance of MFIs.

Barasa et al. (2023) studied the manner in which Kenyan commercial banks' performance was impacted by debt restructuring strategy implementation. The study was supported by the Risk Management Theory. It applied a research design that was descriptive and gathered primary data from 102 managers working in 34 banks operating in Kisumu, Kenya using structured questionnaires. The findings indicated that there was a positive and significant linkage between debt restructuring strategies and performance. More specifically, the banks opted for the provision of lower than market interest rates for borrowers in order to entice them to resume servicing their loans.

This was consistent with the findings of Shurie (2022) but not Kapkiyai et al. (2025) who determined that a more popular debt restructuring approach was the use of an extended repayment period. The key strengths of the study included: the expanded focus on 34 operational banks which enhanced the richness of data; the appropriateness of the sampling procedure; the use of both inferential and descriptive statistical analysis tools; and the extensiveness of the literature review. The knowledge gaps of the study included: the use of a descriptive survey research design which signifies a methodological gap given the lack of sufficient rigor of this design to tackle the main objective of the study; the choice of the risk Management Theory which embodies a theoretical type of gap since the theory is ill-equipped to explain the influence of credit risk management practices on the performance of MFIs; and the concentration on commercial banks instead of agricultural cooperatives which embodies a contextual type of gap on account of the unique operational conditions of agricultural cooperatives relative to commercial banks.

2.3.3 Credit Risk Identification and Performance

Credit risk identification refers to the process through which organisations are able to determine the extent of risk exposures, the nature of the risks, and the risks associated with losses (Yanenkova et al., 2021). A study was conducted by Mwanyika and Koori (2020)

on the influence of credit accessibility on the performance of small-scale farmers in Taita Taveta County, Kenya. The study was supported by the Information Asymmetry, Adverse Selection, Capital Structure, and Pecking Order theories. A research design which was descriptive was selected and primary data gathered from a sample of 111 farmers using self-administered questionnaires. The findings indicated that the lack of effective credit risk identification mechanisms have weakened the credit management efforts of farmer cooperatives since they were unable to prevent the occurrence of adverse selection where some high-risk farmers were able to receive loans. It recommended the development of appropriate credit risk identification techniques such as credit risk checklists in order to enhance their credit risk management.

This affirmed the findings of Nyebar et al. (2024). Conversely, Obondy et al. (2025) determined that the majority of SACCOs conduct comprehensive credit risk identification including the use of financial history reviews, credit risk checklists, scoring models and employment verification prior to the approval of loans. The study was strengthened by the succinct depiction of the research problem; the suitability of the analytical model; and the alignment between the conclusions and resultant recommendations. The study was limited by: the focus on small-scale farmers rather than on agricultural cooperatives which represents a contextual gap since the farmers are on the opposite end of the contractual relationship compared to the agricultural cooperatives.

Mwangi et al. (2021) focused on the manner in which Kenyan SACCOs' financial performance is impacted by credit risk management practices. The agency theory, adverse selection theory and modern portfolio theory underpinned the study. It opted for a descriptive research design and collected primary data from 93 respondents working in 31 SACCOs using questionnaires. The results showed that some of the SACCOs had employed credit risk identification mechanisms that were too strict to the point of discouraging loyal members from borrowing and resulting in poor profitability.

This corroborated the findings of Nkwasiwe and Katsigaire (2023). However, in contrast, Obondy et al. (2025) maintained that whilst many SACCOs had adopted a number of credit risk identification, a number of them were obsolete and needed to be replaced with more modern ones including checklist analysis as part of process optimisation to enhance the attainment of positive financial outcomes. The study's main strengths included: the choice of credit risk management processes; and the large number of SACCOs that comprised the

unit of observation. The study's main knowledge gaps included: the focus on SACCOs in general rather than on agricultural cooperatives which represents a contextual gap since the agricultural cooperatives operate under very unique conditions relative to other SACCOs; and dissimilar choice of theories which embodies a gap of theoretical nature given that these theories are not able to adequately articulate the relationship between credit risk management practices and the performance of MFIs.

Kabugu and Wamiori (2022) investigated the effect of credit risk management practices on financial performance of deposit-taking SACCOs in Mombasa County, Kenya. The study was supported by the Credit Risk, Principal-Agent, Asymmetric Information and Credit Management theories. A descriptive survey research design was adopted and primary data collected from 48 respondents using questionnaires while secondary data was collected using published annual statements of account for the period spanning 2015 and 2020. The data was analysed statistically with the aid of SPSS. According to the results, the most common credit risk identification technique employed by SACCOs was the use of credit referencing with the Credit Referencing Bureau (CRB). Additionally, client history details were investigated by the credit departments. The study recommended that more technical tools for credit risk identification be employed such as credit scenario analysis.

This affirmed the findings of Etenyi et al. (2024). However, in contrast, Paudel (2022), determined that the number of barriers to the adoption of more modern techniques of credit risk management compelled cooperatives in developing economies to stick to the conventional credit risk management techniques. The main strengths of the study included: the suitability of the theoretical framework; as well as the research instrument of choice. The study had a number of research gaps including the use of secondary data which represents a methodological gap given the historical nature of the data; and the focus on all DT-SACCOs rather than on agricultural cooperatives represents a contextual gap since the latter experience very unique operational conditions relative to SACCOs in general.

Ghoujdam et al. (2024) investigated consumer credit risk analysis through artificial intelligence (AI). The study applied a credit scoring model, followed by a thorough examination of each variable in the dataset for the period between 2017 and 2018, and finally a bivariate analysis and logistic regression analysis were conducted. The results indicated that whilst AI-based techniques such as scenario analysis, decision trees and

neural networks, were advantageous in credit risk prediction, the use of logistic regression still carries favour as a viable classical technique. It concludes that the integration of advanced techniques of credit risk prediction ensures enhanced accuracy when dealing with complex relationships within the data and promotes the attainment of improved robustness in the analysis by financial institutions.

This affirmed the findings of Guidici et al. (2020). Conversely, Brown (2024) found that rather than using one or the other, financial institutions should use a hybrid of AI-based techniques and those requiring human expertise so as to incorporate the merits of both categories of credit risk identification techniques. The study's main strengths included: the focus on modern techniques of credit risk management; the well-articulated justification of the study; and the extensive literature review. The study had a number of research gaps including: the absence of a theory which embodies a theoretical type of gap owing to the chaotic and disjointed nature of the study; the absence of concentration on agricultural cooperatives which embodies a contextual gap since agricultural cooperative face very unique operational conditions; the dissimilar research design which embodies a methodological gap since this design was unsuitable to for explaining the present study's research phenomenon; and the dissimilar dependent variable which embodies a conceptual gap given the completely different relationship being investigated.

Ndegwa (2024) studied how Kenyan DT-SACCOs' NPLs are affected by credit risk management practices. The study was anchored on the Credit Risk Theory. The target population comprised 40 DT-SACCOs operational in Nairobi City County while it opted for a correlational research design. Primary data was collected from 256 credit officers using questionnaires. The data was then analysed descriptively and inferentially using SPSS. The results indicated that the identification and assessment of credit risk had enabled the SACCOs to reduce their NPLs. A key approach that was employed was the adoption of expert judgement on the basis of improved training of credit officers.

This was aligned with the findings of Kokonya (2024). However, Olorunsola et al. (2023) established that the lack of investment in best credit risk identification practices has adversely affected the effectiveness of SACCOs in some developing countries such as Nigeria. The key strengths of the study include: the representativeness of the chosen sample; the suitability of the analytical model; and the extensive literature review. The study's main research gaps include: the focus on DT-SACCOs in general rather than

agricultural cooperatives since agricultural cooperatives face unique operational circumstances; the use of correlational research design rather than descriptive which represents a methodological gap since this is ill-equipped to explain the study phenomenon; and the lack of focus on performance as a dependent variable which represents a conceptual gap owing to the different nature of the relationship being investigated.

2.3.4 Credit Risk Control and Performance

Credit risk control is defined as the process through which financial institutions install systems, procedures and processes that ensure the promptness of loan repayments from clients (Aluonzi et al., 2024). Oyogo et al. (2022) focused on how the loan performance of Kenyan SACCOs is impacted by finance data management practices. The study was underpinned by the Modern Portfolio and Agency theories. A research design that was descriptive was selected and primary data gathered from 80 staff of registered DT-SACCOs operational in Busia using structured questionnaires. The findings indicated strong finance data management was a critical antecedent of loan performance. More specifically, through the use of analytical and statistical models, some of the SACCOs have been able to ensure efficient credit data management which has enhanced their loan performance.

This was consistent with the findings of Mbithi (2023). However, Gichuhi and Omagwa (2020) determined that the lack of awareness of effective credit data management techniques had hampered the adoption of these techniques by a number of SACCOs. The study was strengthened by: the focus on technological credit risk management techniques; and the appropriateness of the regression model. The study had a number of research gaps including: the focus on SACCOs in general rather than on agricultural cooperatives which embodies a gap in context since agricultural cooperatives experience very unique operational conditions; and the diverse theories which epitomises a gap of theoretical nature given the unsuitability of these theories in explaining the influence of credit risk management practices on the performance of MFIs.

Angweye and Otinga (2020) examined how Kenyan SACCOs' financial performance is affected by loan insurance policy. The Balanced Portfolio Theory was chosen to support the study and it opted for a research design that was descriptive. Structured questionnaires

were used to extract primary data from a sample of 105 senior managers working in 13 SACCOs in Kakamega County, Kenya. The data was analysed with the aid of SPSS. The results indicated that loan securitisation through loan insurance policy was positively associated with improved financial performance of the SACCOs.

This affirmed the findings of Njuguna (2019). Conversely, Maina et al. (2024) established that the most critical aspect of loan insurance policies that have been adopted by DT-SACCOs is loan loss provisioning which enabled the SACCOs to have adequate levels of working capital. The key strengths of the study were: the suitability of the regression model; and the focus on DT-SACCOs which face greater credit risks. The study's knowledge gaps included: the focus on DT-SACCOs in general rather than agricultural cooperatives which represents a contextual gap given the unique operational conditions faced by agricultural cooperatives; the use of the Balanced Portfolio Theory which embodies a gap of theoretical nature given the unsuitability of this theory in explaining the influence of credit risk management practices on the performance of MFIs; and the specific concentration on loan insurance policy instead of on credit risk management which embodies a gap that is conceptual in origin given the different nature of the relationship being investigated.

Gurmessa et al. (2021) undertook a study on partial credit guarantee and financial additionality for smallholder coffee cooperatives in Ethiopia. The Credit Risk Theory supported the study. A mixed methods research approach was chosen and 80 coffee cooperatives included in the target population. Primary data was collected using key informant interviews and focus group discussions from representatives from these cooperatives. The data was analysed using qualitative techniques of fine-tuning, probing, exploring and triangulation. The findings indicated that owing to the prevalence of credit rationing, the cooperatives only received a small portion of the loans that they had applied for due to institutional limitations and low business capacities.

This corroborated the findings of Crawford et al. (2023) but not Bowen and Makokha (2021) who found that credit information sharing has increasingly become a more effective credit risk control mechanism employed by financial institutions rather than credit rationing. The study's main strengths included: the extensiveness of the empirical literature review; the inclusion of cooperatives from different sectors; as well as the suitability of the mixed methods research design. The study had a contextual gap owing to

the geographical setting of Ethiopia given the different operational conditions of the country; as well as a methodological gap due to its choice of a mixed methods research design which is ill-suited in explaining the study phenomenon.

2.3.5 The Moderating Effect of Firm Size

Kipai et al. (2020) undertook a study on how Kenyan SACCOs' financial performance was affected by membership size. The Organisational Theory anchored the study and the type of research design was cross-sectional survey. Secondary data was gathered from the financial statements of 17 active SACCOs in the County. The study did not find evidence of a strong association between the variables. Nonetheless, it suggested that the organisations endeavour to build their membership so as to become more competitive in terms of increasing their savings.

This corresponded with the findings of Kamurar and Mbuva (2025). However, Sang et al. (2024) determined that firm size played a critical moderating role on the relationship between SACCOS' corporate governance and financial performance since larger SACCOs were able to recruit more qualified members into their boards. The study's main strengths were: the inclusion of all the active SACCOs; and the extensive literature review on studies focused around SACCOs globally, regionally, and locally. The study had a number of research gaps including: the general focus on SACCOs rather than agricultural cooperatives which signifies a contextual gap given the unique nature of the operational conditions of agricultural cooperatives; the use of a cross-sectional survey research design which embodies a gap of methodological origin owing to its unsuitability to the current study; and the choice of Organisational Theory which embodies a gap of theoretical origin since it does not adequately explain the research phenomenon.

Wanjiru and Muturi (2020) investigated Kenyan SACCOs' financial performance antecedents. The Theory of Credit Default, and the Theory of Micro-Loan Borrowing Rates and Default provided the theoretical framework. It chose a descriptive research design and targeted all 12 registered SACCOs in the County. Financial statements of account for the period spanning 2010 and 2014 for the 12 SACCOs enabled the extraction of secondary data. SPSS facilitated the conduct of descriptive and inferential statistical analysis. According to the results, the size of the membership had a weak correlation with the financial performance of the SACCOs when compared with default rate and dividend

policy.

This echoed the findings of Kipai et al. (2020) but differed with those of Sang et al. (2024) explained above. The inclusion of all licensed SACCOs in Kiambu County; the selected regression model; and the extensive literature review represented strengths of the study. The choice of theoretical framework embodies a gap of theoretical origin owing to its unsuitability in explaining the research phenomenon; whereas the absence of concentration on credit risk management represents a conceptual gap since this is a completely different investigation.

Ishmail et al. (2023) examined how the association between credit risk and financial performance pertaining to Kenyan microfinance banks is moderated by firm size. The Agency Theory underpinned the study and it applied both explanatory and quantitative research designs. It targeted 13 registered microfinance banks as at December 2019 and used financial statements for the period spanning 2011 and 2019 to gather secondary data. The findings confirmed evidence of a strong moderating effect of firm size on the other variables.

This was aligned with the findings of Nyangeri et al. (2025). However, Gichinga et al. (2024) established that whilst larger organisations were capable of generating more revenue, the efficiency of the employees deteriorated beyond an optimal number of employees. The main strengths of the study included: the inclusion of all licensed MFBs; and the suitability of the ratio analysis. The study's main research gaps included: the concentration on microfinance banks instead of agricultural cooperatives which embodies a gap of contextual origin given the unique operational conditions of agricultural cooperatives; the diverse theories which signifies a gap of theoretical origin given the unsuitability of these theories to explain the study phenomenon; and the type of research design which embodies a gap of methodological origin owing to its lack of rigor.

A study was conducted on how Kenyan agricultural cooperative societies financial performance was impacted by board responsibility by Kurgat et al. (2025). The Managerial Hegemony Theory supported the study and all 84 agricultural societies in the County were targeted. It applied a cross-sectional descriptive research design and collected secondary data from the 84 cooperatives using financial statements pertaining to the duration from 2017 to 2022. The results indicated that whilst there was a positive and significant

relationship between board responsibility and financial performance, the moderating effect of firm size on this relationship was an insignificant one.

This corresponded with the findings of Gichinga et al. (2024). However, in contrast, Shibutse et al. (2019) posited that firm size had a positive and significant association on the financial performance of DT-SACCOs since larger organisations were able to hire more qualified employees who became more productive than smaller ones. The strengths of the study were: the inclusion of all registered agricultural societies in Kericho County; and the use of both descriptive and inferential statistical analyses. The study's main research gaps were the focus on board responsibility rather than credit risk which embodies a gap that is conceptual in origin due to the different nature of the relationship being investigated; the different theories which represent a gap that is theoretical in nature on account of inadequacy of this theory to explain the existing relationship; and the use of secondary data which represents a methodological gap given the historical nature of the data.

Mangara et al. (2025) investigated the effect of moderation of institutional factors on Tanzanian SACCOs' performance. The Institutional Theory underpinned the study. It selected a positivist research philosophy and an explanatory research design. Questionnaires were then used to gather data from a sample of 143 individuals working in various SACCOs in Tanzania. The data was analysed descriptively and inferentially with the use of SPSS. The findings indicated that organisations that were well endowed with high value assets, were considered more credit worthy than those that did not and, as such, were able to procure loans for development and growth.

This affirmed the findings of Willis et al. (2024) but not Obande et al. (2017) who determined that dairy cooperatives' characteristics such as membership size, democratic control, and level of education were strong moderators of the association between the structure of capital and performance, however, asset valuation was found to be an insignificant moderator. The main strengths of the study were: the large number of SACCOs included; the suitability of the regression model; as well as the sampling design. The study's focus on SACCOs in general and the geographical setting of Tanzania represented contextual gaps owing to the different operational conditions; the application of the Institutional Theory represented a theoretical gap owing to the its unsuitability in explaining the relationship between credit risk management practices and performance of

MFIs; the lack of focus on credit risk represented a conceptual gap due to the different relationship being investigated; whereas the choice of explanatory research design represented a methodological gap owing to the unsuitability

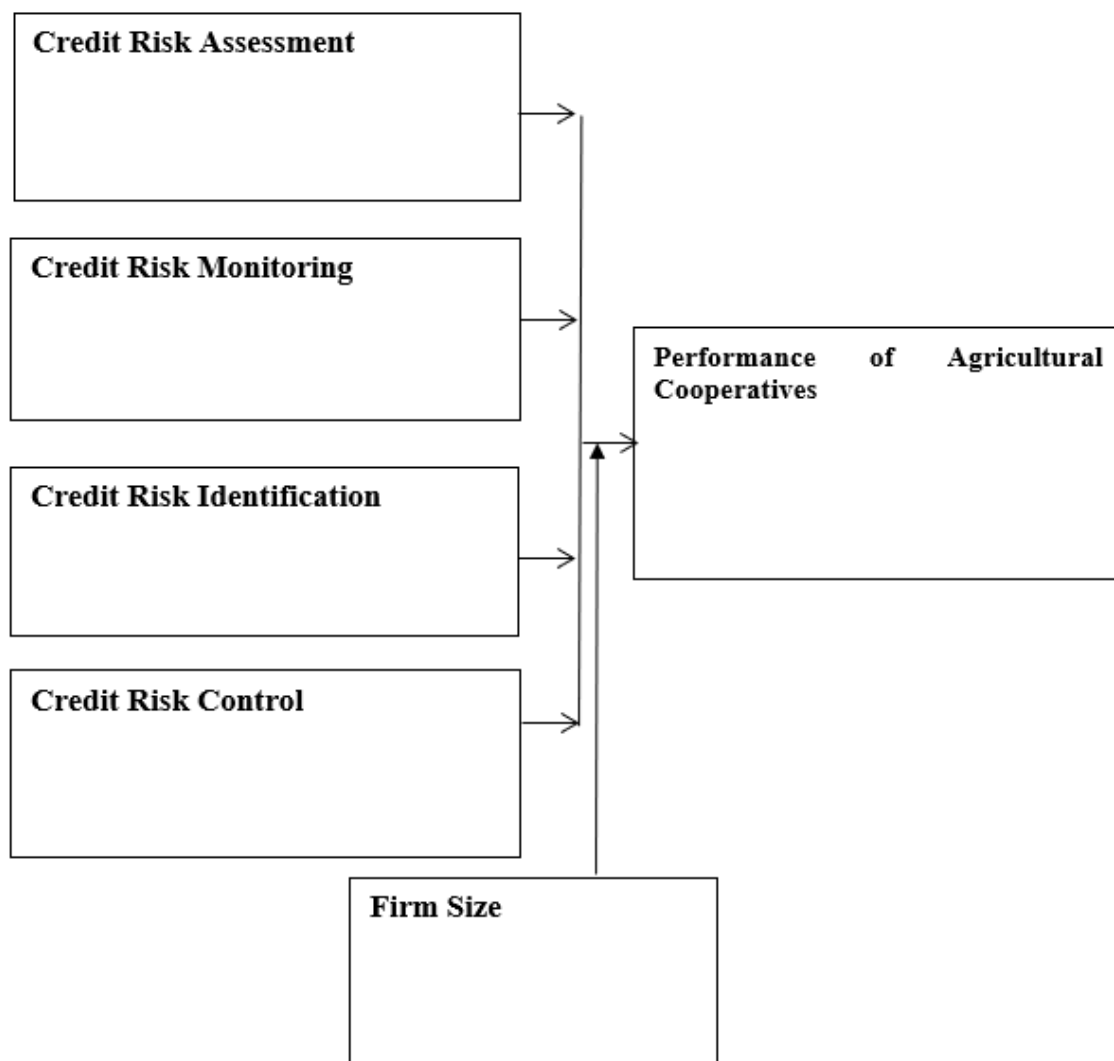
2.4 Summary of Literature and Research Gaps

Summary of literature and research gaps is summarized in Table 2.1 as shown in Appendix V.

2.5 Conceptual Framework

The conceptual framework delineates the link between independent and dependent variables as well as the effect of moderating variables. This research examines the independent factors of risk identification and risk management strategies. All the independent variables are associated with the Credit Risk Theory. The dependent variable is agricultural financing. The Credit Risk Theory enables credit risk assessment by financial institutions to evaluate the likelihood of borrower default and manage financial stability; to develop appropriate credit monitoring techniques that ensure review and follow-up for suitable corrective action whenever issues arise during the credit repayment process; the identification of existing and potential risks in loan products and associated lending activities; and to develop comprehensive risk management policies, implement robust internal controls, diversify their activities, and form audit committees in order to ensure credit risk control. The conceptual framework of the study is presented as shown in Figure 2.1.

Credit Risk Management Processes



Independent Variables

Moderating Variable

Dependent Variable

Figure 2. 1: Conceptual Framework

Source: Research Data (2025).

2.6 Operationalization of Study Variables

It is a systematic plan and structure that outlines the operationalization of variables and the methods used for gathering and analyzing data (Glass & Hopkins, 2021).

Table 2. 1: Operationalization of Variables

Type of Variable	Variable	Indicator	Scales	Data Collection	Supporting Literature
Independent Variable	Credit Risk Assessment	• Appropriate credit risk environment • Sound credit granting process • Appropriate credit administration	Ordinal	Questionnaire	Brahmaiah (2022); Munangi and Sibindi (2020); Imbuye and Miroga (2023); Okero and Waweru (2023)
Independent Variable	Credit Risk Monitoring	• Use of computers • Debt recovery • Debt rescheduling	Ordinal	Questionnaire	Kiprono and Njeru (2022); Maina and Njeru (2023); Gitau (2021); Olajide (2024); Barasa et al. (2023)
Independent Variable	Credit Risk Identification	• Checklist analysis • Scenario analysis • Expert judgement	Ordinal	Questionnaire	Mwanyika and Koori (2020); Mwangi et al. (2021); Kabugu and Wamiori (2022); Ghoujdam et al. (2024); Ndegwa (2024)
Independent Variable	Credit Risk Control	• Credit data management • Loan securitisation • Credit rationing	Ordinal	Questionnaire	Oyogo et al. (2022); Angweye and Otinga (2020); Gichuhi and Omagwa (2020); Gurmessa et al. (2021); Bowen and Makokha

					(2021)
Moderating Variable	Firm Size	• Number of members • Number of employees • Total value of assets	Ordinal	Questionnaire	Kipai et al. (2020); Wanjiru and Muturi (2020); Ishmail et al. (2023); Kurgat et al. (2025); Mangara et al. (2025)
Dependent Variable	Performance	• Improved access to credit • Enhanced market access • Level of sustainability	Ordinal	Questionnaire	Onah et al. (2024); Mpirwa (2022); Ma et al. (2024); Yobe et al. (2024); Cervantes et al. (2023)

Source: Research Data (2025)

2.7 Chapter Summary

This chapter covered the theoretical framework which included discussions on the Credit Risk Theory, Information Asymmetry Theory, and Credit Rationing Theory. The chapter later conducted a detailed empirical review based on credit risk assessment, credit risk monitoring, credit risk identification, credit risk control and firm size. The third aspect that is outlined in the chapter is the conceptual framework which illustrates the linkages amongst the variables including the independent, moderating as well as dependent variable. The chapter also included a summary of the research gaps and operationalization of variables. The next chapter will detail the research methodology of the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research philosophy, design, population, data collection and analysis along with discussions on research quality, validity, and reliability. Lastly, the chapter highlights the ethical considerations.

3.2 Research Philosophy

A research philosophy is a collection of core beliefs that acts as a guide for the planning and execution of a research endeavour. It is designed to help researchers make informed decisions. A wide variety of research philosophies exist, each of which offers a distinctive point of view on the manner in which scientific research ought to be comprehended (Lehman & Hatcher 2020). Kitchenham and Pfleeger (2020) outlines the four fundamental streams of research philosophy, as delineated and debated by numerous scholars, are positivism, interpretivism, pragmatism, and realism. Each stream offers a distinct approach to research. According to Žukauskas et al. (2018), positivism asserts that the social world can be comprehended objectively; pragmatism emphasizes the importance of practical findings based on facts; while realism pertains to the assumptions necessary for understanding human subjectivity.

This study used a positivist research philosophy, using a quantitative research design that incorporates a survey approach with a standardized questionnaire for systematic data collection from informants. The use of this philosophy is justified by its commitment to objective, empirical observation, allowing researchers to generate reliable, verifiable knowledge and establish universal laws. It is ideal for quantitative research, providing a structured, value-free approach to testing hypotheses and predicting phenomena, ensuring high reproducibility and minimizing subjective bias. (Creswell, 2009). The researcher was responsible for generating explanations and predictions on the impact of credit risk management processes on the improvement of agricultural finance.

3.3 Research Design

It is the overall strategy or blueprint which a researcher follows to integrate different study

components in a logical and systematic manner by outlining the methods and procedures for collecting, analysing, and interpreting data to ensure the research objectives are met effectively (Cooper & Schindler, 2020). Orodho and Kombo (2019) assert that study design is not limited to a singular methodology and may encompass both quantitative and qualitative analyses.

This study utilised a correlational research design since it sought to examine the prevailing statistical relationships and associations amongst the different variables as explained by Fischer et al. (2023). Curtis et al. (2016) added that the application of correlational research designs is justified for examining relationships between variables in natural settings where manipulation is impossible, unethical, or impractical. It enables testing associations in non-experimental, real-life contexts, allows for predicting future outcomes, and serves as a foundational step for future, more rigorous experimental studies.

3.4 Population of the Study

The study population encompasses the complete set of individuals, organizations, events, or objects that possess shared traits pertinent to the research aims. It denotes the complete population from which a researcher aims to derive conclusions. Researchers often define their study population based on specific inclusion and exclusion criteria to ensure relevance to the research problem. Since studying the entire population is often impractical, a sample is usually selected using various sampling techniques to make inferences about the whole group (Glen, 2020).

The target population is defined as the number of components that share one or more criteria and may be studied or offer data for inquiry (Peil, 2017). The population of interest in this study was 40 agricultural cooperatives registered and active in the Nairobi Metropolitan Area that features Nairobi, Kiambu, Machakos, Kajiado and Murang'a counties. This comprised the unit of analysis. The distribution of this population is captured in Table 3.1 (Refer to Appendix IV).

3.5 Sampling Design

According to Shieh (2010), sample size is the number of items drawn from the overall target population of the study. Sampling technique refers to a process used by researchers in picking small and manageable size of individuals, items, objects or subjects from the entire population. Van Haute (2021) explained that there are two main sampling techniques:

random sampling which is characterised by the provision of equitable opportunities of selection for each item in the population; and non-random sampling where selection is based on factors that are not down to chance. The sample size is normally chosen to help researchers in getting relevant data/information for the purpose of formulating conclusions and recommendations.

Thus, the primary data was collected from three individuals per cooperative totalling to 120 individuals), which comprised the unit of observation of the study. These individuals were chosen purposely by the researcher. Given the small size of the target population, a census was applied by the researcher in the selection of the sample size.

3.6 Data Collection Methods

Quantitative data was obtained through the use of questionnaires from professionals who engage in credit risk management in the various agricultural cooperatives. Kothari, (2004) argues that questionnaires are a dominant instrument for data collection in social sciences because they are easy to administer. A meticulously crafted questionnaire was developed to gather general information from respondents and address all pertinent research questions. Responses were evaluated using a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) to ascertain the degree of agreement with each aspect of the constructs related to risk management processes and agricultural financing.

Questionnaires were selected as the ideal data gathering devices due to their ability to secure respondent confidentiality, facilitate systematic questioning, and reduce administrative costs. Questionnaires mitigate uncertainty and ambiguities by presenting precisely organized questions that elicit precise and pertinent replies. The questionnaires were administered using a drop and pick later arrangement where the respondents were given 2 weeks to fill the questionnaires. The researcher also provided online questionnaires through the Google forms platform for those who preferred. The researcher used phone call reminders to contact respondents who had not finished filling the questionnaire.

3.7 Research Quality

A good measurement tool is the one which passes the test of validity, reliability, and practicability Cooper & Schindler (2014). Mugenda & Mugenda (2008) assert that an effective research design clearly articulates the objective and ensures coherence between the research question and the selected research methodology. According to Cooper and

Schindler (2014), research quality includes the research procedures applied in ensuring compliance with accepted standards of data collection and analysis, and the eventual attainment of research objectives. As far as this study is concerned, the research quality was enabled by the conduct of validity and reliability tests which sought to confirm the thoroughness of the research instrument, its internal consistency and authenticity. This was part of a pilot study where, in accordance with the recommendations of Mugenda and Mugenda (2003), 10% of the population (12 individuals) were involved. This is explained in detail in the following sections.

3.7.1 Validity of Research Instrument

To ensure content validity, the research supervisor's opinion was solicited to evaluate the data collecting instruments prior to final data collection in the field. Mugenda & Mugenda (2008) noted that reliability is an assessment of the extent to which research produces consistent outcomes upon recurrent trials. Construct validity was conducted using principal component factor analysis where a threshold of 0.5 was adopted on the factor loading values in accordance with the recommendations of Beavers et al. (2019). The results of the construct validity tests are shown in Table 3.1. According to the results, the factor loadings for all the statements were well above 0.5 indicating that each of the statements was sufficiently dissimilar from the others to merit its inclusion in the questionnaire.

Table 3. 1: Construct Validity Test Results

Communalities		
	Initial	Extraction
This cooperative strictly uses credit scores to assess the creditworthiness of farmers and agribusinesses	1.000	.991
Farmers with higher credit scores often receive loans at lower interest rates	1.000	.992
Borrowers with poor or no credit history may face challenges in accessing financing.	1.000	.924
A strong credit history allows farmers to secure higher loan amounts with longer repayment periods.	1.000	.989
Consistent repayment behaviour builds trust with financial institutions, leading to long-term financial support.	1.000	.975
The organisation uses payment behaviour data to categorize borrowers into risk tiers and adjust lending strategies accordingly.	1.000	.979
The cooperative has incorporated the right computer credit risk monitoring solutions to ensure more effective and efficient credit risk monitoring.	1.000	.983

Digitised credit risk monitoring aids had eased the process through which the organisation has been able to evaluate the collateral against the credit applied for, which consequently led to improved loan recovery performance.	1.000	.989
Effective credit management ensured timely debt recovery which translated into improved return on investment for the cooperative.	1.000	.977
The cooperative has experienced challenges in its loan recovery strategies owing to the informal nature of some of the businesses invested by loan recipients and making it more difficult for them to boost their revenues and repay the loans.	1.000	.979
The cooperative opted for the provision of lower than market interest rates for borrowers in order to entice them to resume servicing their loans.	1.000	.912
A more popular debt restructuring approach applied by the cooperative was the use of an extended repayment period.	1.000	.995
The lack of effective credit risk identification mechanisms has weakened the credit management efforts of the cooperative since it has been unable to prevent the occurrence of adverse selection where some high-risk farmers were able to received loans.	1.000	.997
The firm has employed credit risk identification mechanisms that were too strict to the point of discouraging loyal members from borrowing and resulting in poor profitability.	1.000	.952
The most common credit risk identification technique employed by the cooperative is the use of credit referencing with the Credit Referencing Bureau.	1.000	.898
AI-based techniques such as scenario analysis were advantageous in credit risk prediction.	1.000	.960
A key credit risk identification approach that was employed by the firm was the adoption of expert judgement on the basis of improved training of credit officers.	1.000	.972
The lack of investment in best credit risk identification practices has adversely affected the effectiveness of the cooperative.	1.000	.992
Through the use of analytical and statistical models, the cooperative has been able to ensure efficient credit data management which has enhanced its loan performance.	1.000	.965
The lack of awareness of effective credit data management techniques had hampered the adoption of these techniques by the firm.	1.000	.984
Loan securitisation through loan insurance policy has led to improved financial performance of the cooperative.	1.000	.992
The most critical aspect of loan insurance policies that have been adopted by the cooperative is loan loss provisioning.	1.000	.984
Owing to the prevalence of credit rationing, the cooperative only received a small portion of the loans that it had applied for.	1.000	.919

Credit information sharing has increasingly become a more effective credit risk control mechanism employed by financial institutions rather than credit rationing.	1.000	.960
There was no significant relationship between the size of the membership and the performance of the cooperative.	1.000	.992
Larger cooperatives were able to recruit more qualified members into their boards of directors.	1.000	.979
Firm size, as measured by the number employees, had a positive and significant moderating effect on the relationship between credit risk and financial performance of the cooperative.	1.000	.989
Whilst there was a positive and significant relationship between board responsibility and financial performance, the moderating effect of firm size on this relationship was an insignificant one.	1.000	.962
The organisation is well endowed with high value assets, which has enabled it to procure loans for development and growth.	1.000	.971
Asset valuation was an insignificant moderator of the relationship between capital structure and financial performance.	1.000	.966
Farmers with superior access to credit experienced enhanced financial performance relative to those that had poorer access to credit.	1.000	.829
Timely availability of credit was associated with improved financial performance of farmers given that it enabled the purchase of required inputs and farm machinery that were essential for production.	1.000	.991
The agricultural cooperative has ensured the provision of collective bargaining power to assist farmers in achieving higher sales volumes.	1.000	.921
The cooperative has been able to improve the proximity of farmers to markets through the establishment of policies that enhanced cooperative market participation.	1.000	.922
Through the adoption of a community-oriented approach and unique organisational structures the cooperative has been able to promote the sustainability of smallholder farmers in rural areas.	1.000	.995
The cooperative has been able to ensure the sustainability of smallholder farmers through the provision of training in sustainable agricultural practices.	1.000	.916

Extraction Method: Principal Component Analysis.

3.6.2 Reliability Test

A reliability test was performed to ascertain the data collection. The instrument typically yields consistent outcomes across multiple trials. The statistical coefficient Cronbach's Alpha (α) was employed as an indicator of internal reliability, as defined by Cronbach (1971), utilizing the Statistical Package for Social Sciences (SPSS) software. The values of the Cronbach's alpha coefficients range from 0 to 1. A threshold of 0.7 was adopted as the

criterion for reliability to ensure the questionnaire fulfils the necessary standards condition Cooper and Schindler, (2014). The reliability results are captured in Table 3.2. The results indicate that the Cronbach Alpha scores were well above the 0.7 threshold both when taken collectively and individually for each of the variables, indicating an acceptable level of internal consistency.

Table 3. 2: Reliability Test Results

Variable	Reliability Statistics	
	Cronbach's Alpha	N of Items
Combined	0.895	36
Credit Risk Assessment	0.763	6
Credit Risk Monitoring	0.721	6
Credit Risk Identification	0.738	6
Credit Risk Control	0.727	6
Firm Size	0.733	6
Performance	0.746	6

3.8 Data Analysis

In this research utilization of quantitative data guided the analysis. Thus, version 26 of SPSS was utilized. In order to get a better understanding of the quantitative data, descriptive statistics like mean and standard deviation were utilized. Determinations of coefficient and the correlation were utilized so as to confirm the degree of significance of the prevailing association amongst the variables. So as to demonstrate the connection amongst the variables, the Analysis of Variables approach was also applied. Inferential statistics employed simple regression to determine the direct relationships between independent variable constructs and the dependent variable, while multiple regression was used to assess the cumulative effect of the independent variable constructs on the dependent variable. The Pearson correlation coefficient analysis enabled the measurement of the robustness of the relationships among the variables.

Data presentation in research is a critical step in effectively communicating the findings to others. Proper data presentation enhances the clarity of the research, makes it easier for readers or viewers to understand the results, and helps researchers to convey the significance of the findings. The choice of presentation method depends on the type of data, the purpose of communication, and the target audience (Glass & Hopkins, 2021). Therefore, the data was presented by use of tables and charts.

The generic ordinal logistic regression model is as follows:

$$\log \left(\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right) = \alpha_j + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p$$

Where;

- $P(Y \leq j)$ is the cumulative probability of the outcome being in category j or below.
- α_j is the threshold (or intercept) for category j .
- $\beta_1, \beta_2, \dots, \beta_p$ are coefficients for independent variables $X_1, X_2, \dots, X_p$.

The following ordinal logistic regression model was used to capture the variables of the study

$$\log \left(\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right) = \alpha_j + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots \dots \dots (1)$$

Where:

X_1 = Credit Risk Assessment

X_2 = Credit Risk Monitoring

X_3 = Credit Risk Identification

X_4 = Credit Risk Control

B_{1-4} = Coefficients of independent variables

The moderation effect will change the above equation as follows:

$$\log \left(\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right) = \alpha_j + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_1 \times X_5 + \beta_6 X_2 \times X_5 + \beta_7 X_3 \times X_5 + \beta_8 X_4 \times X_5 \dots \dots \dots (2)$$

Where:

X_5 = Firm Size (moderating variable)

B_{5-8} = moderated coefficients of independent variables

3.8.1 Diagnostic Tests

The study conducted four diagnostic tests including normality, multicollinearity, heteroscedasticity, and linearity tests so as to ensure the appropriateness of the ordinal logistic regression model for the research. The following sections articulate these tests in more detail.

3.8.1.1 Multicollinearity Test

Multicollinearity refers to the statistical phenomenon that is characterised by a strong association between multiple predictors in a given regression model (Kalnins, 2018). The study will utilize the Variance Inflation Factor (VIF) technique for sensing multicollinearity

as suggested by Shreshta (2020). SPSS was used for computing a VIF for each predictor variable. VIFs typically begin at 1 and continue to infinity. A VIF of 1 suggests the absence of correlation between a predictor variable and any others. VIFs that are valued between 1 and 5 indicate the presence of a moderate correlation. VIFs that exceed 5 represent serious levels of multicollinearity.

3.8.1.2 Normality Test

Khatun (2021) defined normality tests as parametric tests that seek to determine whether the data pertaining to a given study is characterised by a normal distribution. There are several methods applied in testing for normality including: graphic techniques such as probability-probability (P-P), histograms and stem-and-leaf charts; and statistical techniques such as Lilliefors corrected K-S test, Kolimogorov-Smirnov (K-S) test, and the Shapiro-Wilk test. The application of the K-S test is typically based on the attainment of a sample size greater than 50 while the Shapiro-Wilk test is used when the sample size is less than 50. The Shapiro-Wilk test was used.

3.8.1.3 Heteroscedasticity Test

According to Khaled et al. (2019), heteroscedasticity seeks to determine whether the regression model has a consistent ability to forecast the outcome variable across all values of the predictor variables. The tests can be carried out through graphic methods such as scatter plots; or statistical techniques such as the Breusch-Pagan test which applies a normal chi square test. This study used the Breusch-Pagan test of heteroscedasticity owing to its relative simplicity and capability of incorporating more explanatory variables as suggested by Raza et al. (2023).

3.8.1.4 Linearity Test

Montgomery et al. (2021) explained that linearity is a condition whereby the regression model's predictor variables relate with the outcome variable in a straight-line. This is normally tested using the output of Analysis of Variance (ANOVA) through the use of the level of significance. Accordingly, a significance in excess of 0.05 signifies the presence of a linear relationship. The study employed the use of ANOVA to determine linearity.

3.9 Ethical Considerations

Ethical concerns were rigorously observed, as mandated by the University's policies and regulations. The researcher obtained permission from the institution to conduct data collection. Participation was voluntary; no individual was compelled, pressured, or deceived into participating. All participants got a thorough briefing of the study's aims to help them make an informed choice about their participation. The researcher guaranteed the participant's rights to secrecy and privacy maintained. The questionnaire did not gather personally identifying information from responders. The researcher sought ethical approval to conduct the research from the Ethics Review Committee of Strathmore University and secured a Research Permit from the National Commission for Science, Technology, and Innovation (NACOSTI).

3.10 Chapter Summary

This chapter discussed the components of the proposed research methodology. It commences with a discussion of research philosophy attributes, subsequently, the research design, study population, and data collection methods are elucidated. The chapter finishes off with an analysis of data, study quality, data analysis, diagnostic assessments, and ethical issues.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the findings of the study. The study sought to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size. The findings comprise the demographic characteristics of the respondents, the descriptive analyses, the diagnostic test results, and inferential analyses. The findings are presented using data from SPSS and organized variable by variable in tables and figures, and then interpreted and summarized accordingly.

4.2 Response Rate

The response rate refers to the percentage of individuals who actually provided responses to questions posed to them in a survey as a proportion of the total number of individuals who originally participated in the survey (Mellahi & Harris, 2016). The response rate pertaining to the study is presented in Table 4.1. Accordingly, out of a total number of 120 questionnaires that were administered, 91 responded to while 29 did not, representing 76% and 24%, respectively. This was well above the recommended threshold of 30%-70% for business and management research (Goyder, 1985).

Table 4. 1: Response Rate

Description	Number	Percent
Questionnaires that were responded to	91	76%
Questionnaires that were not responded to	29	24%
Total questionnaires that were administered	120	100%

Source: Author (2025)

4.3 Demographic Characteristics of the Respondents

The demographic characteristics of the respondents of the study featured the title of the respondents, the length of employment, and the familiarity with credit risk management processes. The results, which were illustrated by figures, and discussed in detail in the sections below.

4.3.1 Title of Respondents

The first classification of the demographic characteristics was in accordance with the title of the respondents. These results, which are presented in Figure 4.1 indicate that out of a total of 91 respondents, 19 were loan officers, 14 were credit risk managers, 31 were branch managers, while 27 were other title categories, representing 20.8%, 15.6%, 33.8%, and 29.9%, respectively. Thus, whilst there was wide dispersion of title categories, the majority of respondents were either branch managers or other title categories indicating that most of the respondents were decision and policy makers within the cooperative societies.

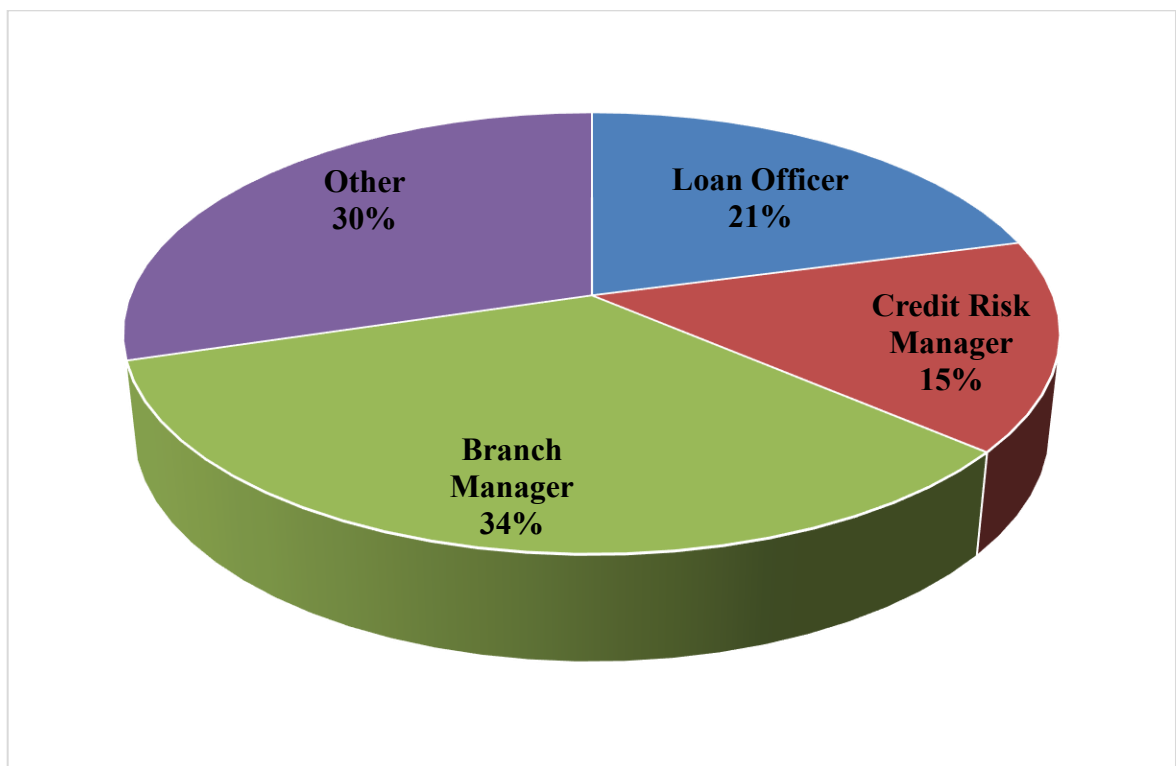


Figure 4. 1: Distribution of Title of Respondents

Source: Author (2025)

4.3.2 Length of Employment

The second classification of the demographic characteristics is the length of employment. The results of this classification, which are presented in Figure 4.2 show that out of a total of 91 respondents, 7 had worked for less than 1 year, 15 for 1-3 years, 24 for 4-6 years, and 45 for more than 6 years, representing 7.8%, 16.9%, 26%, and 49.4%, respectively. This is an indicator that the cooperative societies had a relatively high staff retention, or there was a low staff turnover.

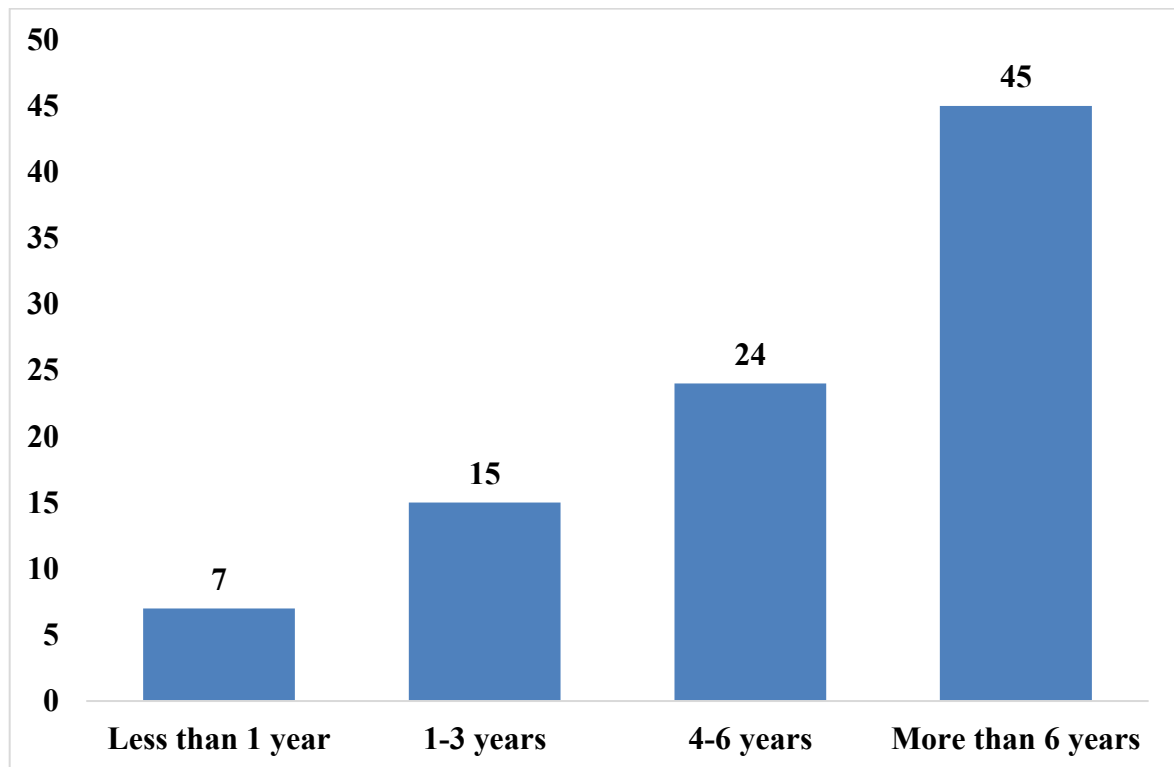


Figure 4. 2: Distribution of Length of Employment

Source: Author (2025)

4.3.3 Familiarity with Credit Risk Management Processes

The final classification of the demographic characteristics of the respondents was the familiarity with credit risk management processes. The results which are presented in Figure 4.3 show that out of 91 respondents, 7 were somewhat familiar, 4 were neutral, 40 were familiar, while 40 were very familiar with credit management processes, representing 7.8%, 3.9%, 44.2%, and 44.2%, respectively. This is an indicator that there was a high level of familiarity with credit risk management processes amongst the respondents from the cooperative societies.

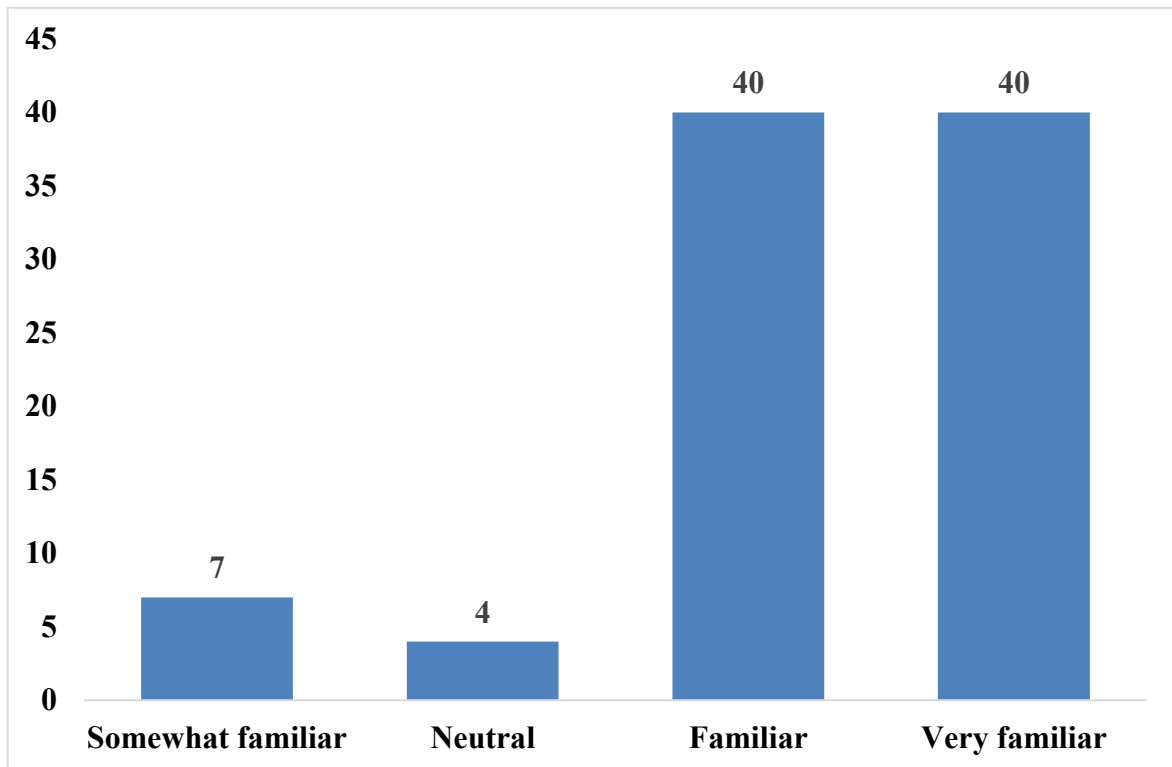


Figure 4. 3: Distribution of Familiarity with Credit Risk Management Processes

Source: Author (2025)

4.4 Descriptive Analyses

The descriptive analyses of the study featured frequency distributions, means and standard deviations for each of the variables. The results are presented in tables and discussed in detail in the following sections.

4.4.1 Credit Risk Assessment and Performance

The descriptive analysis pertaining to credit risk assessment is captured in Table 4.2. The results show that the majority of the respondents agreed with the statement that the cooperative strictly uses credit scores to assess the creditworthiness of farmers and agribusinesses (Mean=3.7662; Standard deviation=1.31686). This was consistent with the findings of Brahmaiah (2022). Additionally, the study found that most of the respondents affirmed the statement that farmers with higher credit scores often receive loans at lower interest rates (mean=3.8234; standard deviation=1.31828), which was aligned with the findings of Munangi and Sibindi (2020).

The findings further established that there was a high level of agreement amongst the

respondents with the statement that borrowers with poor or no credit history may face challenges in accessing financing (mean=3.8182; standard deviation=1.15539), which echoed the findings of Imbuye and Miroga (2023). Also, the findings indicated that most of the respondents agreed with the statement that a strong credit history allows farmers to secure higher loan amounts with longer repayment periods (mean=3.6364; standard deviation=1.33682).

The findings further indicated that most of the respondents agreed that consistent repayment behaviour builds trust with financial institutions, leading to long-term financial support (mean=3.9221; standard deviation=1.51975). This corroborated the findings of Kadima et al., (2022). Lastly, the study determined that the vast majority of the respondents affirmed the statement that the organisation uses payment behaviour data to categorize borrowers into risk tiers and adjust lending strategies accordingly (mean=4.4286; standard deviation = 0.63719). This was aligned with the findings of Okero and Waweru (2023).

Table 4. 2: Descriptive Results of Credit Risk Assessment

	N	Mean	Std. Deviation
This cooperative strictly uses credit scores to assess the creditworthiness of farmers and agribusinesses	91	3.7662	1.31686
Farmers with higher credit scores often receive loans at lower interest rates	91	2.6234	1.31828
Borrowers with poor or no credit history may face challenges in accessing financing.	91	3.8182	1.15539
A strong credit history allows farmers to secure higher loan amounts with longer repayment periods.	91	3.6364	1.33682
Consistent repayment behaviour builds trust with financial institutions, leading to long-term financial support.	91	3.9221	1.51975
The organisation uses payment behaviour data to categorize borrowers into risk tiers and adjust lending strategies accordingly.	91	4.4286	.63719
Valid N (listwise)	91		

Source: Author (2025)

4.4.2 Credit Risk Monitoring and Performance

The findings of the descriptive analysis of credit risk monitoring are presented in Table 4.3.

The findings showed that most of the respondents agreed with the statement that the cooperative has incorporated the right computer credit risk monitoring solutions to ensure more effective and efficient credit risk monitoring (mean=3.6234; standard deviation=0.85899). This was aligned with the findings of Kiprono and Njeru (2022). Additionally, the study found that the vast majority of the respondents agreed with the statement that digitised credit risk monitoring aids had eased the process through which the organisation has been able to evaluate the collateral against the credit applied for, which consequently led to improved loan recovery performance (mean=4.4026; standard deviation=0.71192). This was consistent with the findings of Maina and Njeru (2023).

Furthermore, the results showed that there was a high level of agreement by the respondents with the statement that effective credit management ensured timely debt recovery which translated into improved return on investment for the cooperative (mean=4.1818; standard deviation=1.25370). This corroborated the findings of Gitau (2021). Most of the respondents affirmed the statement that the cooperative has experienced challenges in its loan recovery strategies owing to the informal nature of some of the businesses invested by loan recipients and making it more difficult for them to boost their revenues and repay the loans (mean=3.7792; standard deviation=1.23142). This echoed the findings of Olajide (2024).

The findings also indicated that a marginal majority of respondents agreed with the statement that the cooperative opted for the provision of lower than market interest rates for borrowers in order to entice them to resume servicing their loans (mean=3.4026; standard deviation=1.12694). This confirmed the findings of Barasa et al. (2023). Lastly, the study found that most of the respondents agreed with the statement that a more popular debt restructuring approach applied by the cooperative was the use of an extended repayment period (mean=3.7403; standard deviation=1.10504). This was aligned with the findings of Shurie (2022).

Table 4. 3: Descriptive Results of Credit Risk Monitoring

	N	Mean	Std. Deviation
The cooperative has incorporated the right computer credit risk monitoring solutions to ensure more effective and efficient credit risk monitoring.	91	3.6234	.85899
Digitised credit risk monitoring aids had eased the process through which the organisation has been able to evaluate the collateral against the credit applied for, which consequently led to improved loan recovery performance.	91	4.4026	.71192
Effective credit management ensured timely debt recovery which translated into improved return on investment for the cooperative.	91	4.1818	1.25370
The cooperative has experienced challenges in its loan recovery strategies owing to the informal nature of some of the businesses invested by loan recipients and making it more difficult for them to boost their revenues and repay the loans.	91	3.7792	1.23142
The cooperative opted for the provision of lower than market interest rates for borrowers in order to entice them to resume servicing their loans.	91	3.4026	1.12694
A more popular debt restructuring approach applied by the cooperative was the use of an extended repayment period.	91	3.7403	1.10504
Valid N (listwise)	91		

Source: Author (2025)

4.4.3 Credit Risk Identification and Performance

The results pertaining to the descriptive analysis of credit risk identification are presented in Table 4.4. According to the results, the majority of the respondents agreed with the statement that the lack of effective credit risk identification mechanisms has weakened the credit management efforts of the cooperative since it has been unable to prevent the occurrence of adverse selection where some high-risk farmers were able to receive loans (mean=3.8571; standard deviation=.02231). This affirmed the findings of Mwanyika and Koori (2020). Additionally, a moderate majority of the respondents agreed with the statement that the firm has employed credit risk identification mechanisms that were too strict to the point of discouraging loyal members from borrowing and resulting in poor

profitability (mean=3.1429; standard deviation=1.24303). This was consistent with the findings of Mwangi et al. (2021).

The study further found that most of the respondents agreed that the most common credit risk identification technique employed by the cooperative is the use of credit referencing with the Credit Referencing Bureau (mean=3.8442; standard deviation=0.97421). This echoed the findings of Kabugu and Wamiori (2022). Furthermore, a slight majority of the respondents agreed with the statement that AI-based techniques such as scenario analysis were advantageous in credit risk prediction (mean=3.4156; standard deviation=1.11627). This corroborated the findings of Ghoujdam et al. (2024).

The study also found that a strong majority of the respondents agreed with the statement that a key credit risk identification approach that was employed by the firm was the adoption of expert judgement on the basis of improved training of credit officers (mean=4.1818; standard deviation=0.82282). This was aligned with the findings of Ndegwa (2024). Finally, the study found that most of the respondents agreed with the statement that the lack of investment in best credit risk identification processes has adversely affected the effectiveness of the cooperative (mean=3.8182; standard deviation=1.02247). This tallied with the findings of Olorunsola et al. (2023).

Table 4. 4: Descriptive Results of Credit Risk Identification

	N	Mean	Std. Deviation
The lack of effective credit risk identification mechanisms has weakened the credit management efforts of the cooperative since it has been unable to prevent the occurrence of adverse selection where some high-risk farmers were able to received loans.	91	3.8571	1.02231
The firm has employed credit risk identification mechanisms that were too strict to the point of discouraging loyal members from borrowing and resulting in poor profitability.	91	3.1429	1.24303
The most common credit risk identification technique employed by the cooperative is the use of credit referencing with the Credit Referencing Bureau.	91	3.8442	.97421
AI-based techniques such as scenario analysis were advantageous in credit risk prediction.	91	3.4156	1.11627

A key credit risk identification approach that was employed by the firm was the adoption of expert judgement on the basis of improved training of credit officers.	91	4.1818	.82282
The lack of investment in best credit risk identification processes has adversely affected the effectiveness of the cooperative.	91	3.8182	1.02247
Valid N (listwise)	91		

Source: Author (2025)

4.4.4 Credit Risk Control and Performance

The results of the descriptive analysis relating to credit risk control are shown in Table 4.5. According to the results, the vast majority of the respondents agreed with the statement that through the use of analytical and statistical models, the cooperative has been able to ensure efficient credit data management which has enhanced its loan performance (mean=4.3377; standard deviation=0.73646). This was consistent with the findings of Oyogo et al. (2022). Additionally, the results indicated that most of the respondents agreed that the lack of awareness of effective credit data management techniques had hampered the adoption of these techniques by the firm (mean=3.6494; standard deviation=1.09744). This confirmed the findings of Angweye and Otinga (2020).

The results also showed that most of the respondents agreed that loan securitisation through loan insurance policy has led to improved financial performance of the cooperative (mean=3.8052; standard deviation =1.20349). This was aligned with the findings of Njuguna (2019). Most of the respondents either agreed or strongly agreed with the statement that the most critical aspect of loan insurance policies that have been adopted by the cooperative is loan loss provisioning (mean=3.4675; standard deviation=1.31374). This corroborated the findings of Gurmesssa et al. (2021).

Furthermore, the findings showed that a moderate majority of the respondents agreed with the statement that owing to the prevalence of credit rationing, the cooperative only received a small portion of the loans that it had applied for (mean=2.7532; standard deviation=0.89083). This was aligned with the findings of Crawford et al. (2023). Finally, the findings indicated that the majority of the respondents agreed that credit information sharing has increasingly become a more effective credit risk control mechanism employed by financial institutions rather than credit rationing (mean=3.7143; standard deviation=1.15687). This affirmed the findings of Bowen and Makokha (2021).

Table 4. 5: Descriptive Results of Credit Risk Control

	N	Mean	Std. Deviation
Through the use of analytical and statistical models, the cooperative has been able to ensure efficient credit data management which has enhanced its loan performance.	91	4.3377	.73646
The lack of awareness of effective credit data management techniques had hampered the adoption of these techniques by the firm.	91	3.6494	1.09744
Loan securitisation through loan insurance policy has led to improved financial performance of the cooperative.	91	3.8052	1.20349
The most critical aspect of loan insurance policies that have been adopted by the cooperative is loan loss provisioning.	91	3.4675	1.31374
Owing to the prevalence of credit rationing, the cooperative only received a small portion of the loans that it had applied for.	91	2.7532	.89083
Credit information sharing has increasingly become a more effective credit risk control mechanism employed by financial institutions rather than credit rationing.	91	3.7143	1.15687
Valid N (listwise)	91		

Source: Author (2025)

4.4.5 The Moderating Effect of Firm Size

The results pertaining to the descriptive analysis of firm size are captured in Table 4.6. According to the results, a moderate majority of the respondents agreed with the statement that there was no significant relationship between the size of the membership and the performance of the cooperative (mean=2.8182; standard deviation=1.32513). This partially affirmed the findings of Kipai et al. (2020). Additionally, the study found that most of the respondents agreed with the statement that larger cooperatives were able to recruit more qualified members into their boards of directors (mean=3.7013; standard deviation=1.10102). This was aligned with the findings of Wanjiru and Muturi (2020).

The results also showed that the majority of the respondents agreed that firm size, as measured by the number of employees, had a positive and significant moderating effect on the relationship between credit risk and financial performance of the cooperative (mean=3.7013; standard deviation=1.11290). This corroborated the findings of Ishmail et al. (2023). Further, a marginal majority of respondents agreed with the statement that whilst

there was a positive and significant relationship between board responsibility and financial performance, the moderating effect of firm size on this relationship was an insignificant one (mean=2.8701; standard deviation=1.19594). This only partially affirmed the findings of Kurgat et al. (2025).

The results also indicated that a moderate majority of respondents agreed with the statement that the organisation is well endowed with high value assets, which has enabled it to procure loans for development and growth (mean=3.1688; standard deviation=1.27116). This was partially aligned with the findings of Mangara et al. (2025). Finally, the study established that the respondents agreed marginally with the statement that asset valuation was an insignificant moderator of the relationship between capital structure and financial performance (mean=2.8831; standard deviation=0.98641). This was aligned with the findings of Obande et al. (2017).

Table 4. 6: Descriptive Results of Firm Size

	N	Mean	Std. Deviation
There was no significant relationship between the size of the membership and the performance of the cooperative.	91	2.8182	1.32513
Larger cooperatives were able to recruit more qualified members into their boards of directors.	91	3.7013	1.10102
Firm size, as measured by the number employees, had a positive and significant moderating effect on the relationship between credit risk and financial performance of the cooperative.	91	3.7013	1.11290
Whilst there was a positive and significant relationship between board responsibility and financial performance, the moderating effect of firm size on this relationship was an insignificant one.	91	2.8701	1.19594
The organisation is well endowed with high value assets, which has enabled it to procure loans for development and growth.	91	3.1688	1.27116
Asset valuation was an insignificant moderator of the relationship between capital structure and financial performance.	91	2.8831	.98641
Valid N (listwise)	91		

Source: Author (2025)

4.4.6 Performance

The results of the descriptive analysis of performance are captured in Table 4.7. According to the results, the vast majority of the respondents agreed with the statement that farmers with superior access to credit experienced enhanced financial performance relative to those that had poorer access to credit (mean=4.1169; standard deviation=0.98641). This was consistent with the findings of Onah et al. (2024). Additionally, the study established that all the respondents agreed with the statement that timely availability of credit was associated with improved financial performance of farmers given that it enabled the purchase of required inputs and farm machinery that were essential for production (mean=4.6104; standard deviation=0.49086). This was aligned with the findings of Mwanyika and Koori (2020).

The study also determined that most of the respondents agreed with the statement that the agricultural cooperative has ensured the provision of collective bargaining power to assist farmers in achieving higher sales volumes (mean=3.8571; standard deviation=1.10875). This corroborated the findings of Ma et al. (2024). The study also found that the majority of the respondents agreed with the statement that the cooperative has been able to improve the proximity of farmers to markets through the establishment of policies that enhanced cooperative market participation (mean=3.8312; standard deviation=0.92342). This tallied with the findings of Onyango et al. (2023).

Furthermore, the study found that there was a strong level of affirmation by the respondents of the statement that through the adoption of a community-oriented approach and unique organisational structures the cooperative has been able to promote the sustainability of smallholder farmers in rural areas (mean=4.3506; standard deviation=0.68376). This was consistent with the findings of Cervantes et al. (2023). Finally, the study established that the respondents strongly agreed with the statement that the cooperative has been able to ensure the sustainability of smallholder farmers through the provision of training in sustainable agricultural practices (mean=4.1688; standard deviation=0.67673). This was aligned with the findings of Ingutia and Sumelius (2024).

Table 4. 7: Descriptive Results of Performance

	N	Mean	Std. Deviation
Farmers with superior access to credit experienced enhanced financial performance relative to those that had poorer access to credit.	91	4.1169	.98641
Timely availability of credit was associated with improved financial performance of farmers given that it enabled the purchase of required inputs and farm machinery that were essential for production.	91	4.6104	.49086
The agricultural cooperative has ensured the provision of collective bargaining power to assist farmers in achieving higher sales volumes.	91	3.8571	1.10875
The cooperative has been able to improve the proximity of farmers to markets through the establishment of policies that enhanced cooperative market participation.	91	3.8312	.92342
Through the adoption of a community-oriented approach and unique organisational structures the cooperative has been able to promote the sustainability of smallholder farmers in rural areas.	91	4.3506	.68376
The cooperative has been able to ensure the sustainability of smallholder farmers through the provision of training in sustainable agricultural practices.	91	4.1688	.67673
Valid N (listwise)	91		

Source: Author (2025)

4.5 Pearson Correlation Analysis

Schober et al. (2018) defined correlation coefficients as measures of the magnitude of association that exists between one variable when gauged against a change in the magnitude of another. Additionally, Pearson correlation coefficients are typically applied for data that is characterised by a bivariate normal distribution. The results pertaining to the Pearson correlation coefficients of the study are presented in Table 4.12. According to results, all the independent variables (Credit Risk Assessment, Credit Risk Monitoring, Credit Risk Identification, and Credit Risk Control) have positive correlations of $r = 0.283$, $r = 0.020$, $r = 0.290$, and $r = 0.076$ with the dependent variable (Performance). Furthermore, the moderating variable (Firm Value) had a positive correlation of $r = 0.190$ with Performance. Additionally, the p-values for all the variables were ≤ 0.05 indicating the existence of a

statistically significant relationship between each one of them and the dependent variable as suggested by Di Leo and Sardanelli (2020).

Table 4. 8: Pearson Correlation Analysis

		Correlations					
		CRA	CRM	CRI	CRC	FS	Perf
CRA	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	91					
CRM	Pearson Correlation	.265*	1				
	Sig. (2-tailed)	.020					
	N	91	91				
CRI	Pearson Correlation	.317**	.438**	1			
	Sig. (2-tailed)	.005	.000				
	N	91	91	91			
CRC	Pearson Correlation	.631**	.116	.426**	1		
	Sig. (2-tailed)	.000	.317	.000			
	N	91	91	91	91		
FS	Pearson Correlation	.417**	.537**	.712**	.414**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	91	91	91	91	91	
Perf	Pearson Correlation	.283*	.020	.290*	.076	.190	1
	Sig. (2-tailed)	.013	.003	.001	.001	.008	
	N	91	91	91	91	91	91

*. Correlation is significant at the 0.05 level (2-tailed).

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

Key: CRA – Credit Risk Assessment; CRM - Credit Risk Monitoring; CRI – Credit Risk Identification; CRC – Credit Risk Control; FS – Firm Size; Perf - Performance

Source: Author (2025)

4.6 Diagnostic Test Results

The study conducted a number of diagnostic tests to confirm the suitability of the regression model, including multicollinearity, normality, heteroscedasticity, and linearity tests. The results, which were presented in tables are discussed in detail in the following section.

4.6.1 Multicollinearity Test Results

The results of the multicollinearity test are presented in Table 4.8. According to the results, the VIFs for four independent variables were 2.185, 1.345, 2.236 and 2.292, for Credit Risk Assessment, Credit Risk Monitoring, Credit Risk Identification and Credit Risk Control, respectively. Given that these values were greater than 1 and less than 10 then it is apparent that there is no multicollinearity. In other words, there is no strong relationship between each of the independent variables and the dependent variable and are, thus statistically significant meaning that they contribute significantly to the model when each of them is included. This confirms the suitability of the multiple regression model for the pilot. Additionally, since the VIF for Firm Value, the moderating variable, is 2.629, the same conclusion can be drawn for this variable.

Table 4. 9: Multicollinearity Test Results

Coefficients		
Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Credit Risk Assessment	.458	2.185
Credit Risk Monitoring	.744	1.345
Credit Risk Identification	.447	2.236
Credit Risk Control	.436	2.292
1 Firm Size	.380	2.629

a. Dependent Variable: Performance

Source: Author (2025)

4.6.2 Normality Test Results

The results of the normality test are presented in Table 4.9. The results indicate that the p-values for Credit Risk Assessment were 0.000, 0.006 and 0.000 indicating that it was statistically significant and, therefore, not normally distributed. Additionally, the p-values for Credit Risk Monitoring were 0.004 and 0.024 indicating that it was statistically

significant and, therefore, not normally distributed. Further, the p-values for Credit Risk identification were 0.000 and 0.004 indicating that it was statistically significant and, therefore, not normally distributed. Finally, the p-value for Credit Risk Control was 0.001 indicating that it was statistically significant and, therefore, not normally distributed. Additionally, the p-value for Firm Value was 0.001 indicating that it was statistically significant and, therefore, not normally distributed.

Table 4. 10: Normality Test Results

		Tests of Normality					
		Kolmogorov-Smirnov			Shapiro-Wilk		
		Statisti			Statisti		
Credit Risk Assessment		c	df	Sig.	c	df	Sig.
Performance	Neutral	.385	3		.750	3	.000
	Agree	.367	5	.026	.684	5	.006
	Strongly Agree	.385	3		.750	3	.000

a. Performance is constant when Credit Risk Assessment = Disagree. It has been omitted.

b. Lilliefors Significance Correction

		Tests of Normality					
		Kolmogorov-Smirnov			Shapiro-Wilk		
		Statisti			Statisti		
Credit Risk Monitoring		c	df	Sig.	c	df	Sig.
Performance	Agree	.319	6	.056	.683	6	.004
	Strongly Agree	.307	4		.729	4	.024

a. Performance is constant when Credit Risk Monitoring = Neutral. It has been omitted.

b. Lilliefors Significance Correction

		Tests of Normality^b					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statisti			Statisti		
Credit Risk Identification		c	df	Sig.	c	df	Sig.
Performance	Neutral	.385	3		.750	3	.000
	Agree	.319	6	.056	.683	6	.004

a. Lilliefors Significance Correction

b. Performance is constant when Credit Risk Identification = Strongly Agree. It has been omitted.

		Tests of Normality^{a,b,d}					
		Kolmogorov-Smirnov ^c			Shapiro-Wilk		
		Statisti			Statisti		
Credit Risk Control		c	df	Sig.	c	df	Sig.
Performance	Agree	.360	7	.007	.664	7	.001

a. Performance is constant when Credit Risk Control = Disagree. It has been omitted.

- b. Performance is constant when Credit Risk Control = Neutral. It has been omitted.
- c. Lilliefors Significance Correction
- d. Performance is constant when Credit Risk Control = Strongly Agree. It has been omitted.

Source: Author (2025)

4.6.3 Heteroscedasticity Test Results

The results of the heteroscedasticity test are captured in Table 4.10. These results indicate that using the Breusch Pagan test, it can be observed that the p-values for all the variables were 0.865, 0.138, 0.821, 0.596, and 0.420 which are above 0.05 indicating that they are statistically insignificant and confirming the absence of heteroscedasticity. This means that the standard errors that are in the output table of the regression are reliable.

Table 4. 11: Heteroscedasticity Test Results

Model	Coefficients ^a				
	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	-.215	.218		-.984	.363
Credit Risk Assessment	-.007	.040	-.087	-.178	.865
Credit Risk Monitoring	.071	.041	.659	1.711	.138
Credit Risk Identification	.012	.052	.118	.237	.821
Credit Risk Control	.025	.045	.281	.559	.596
1 Firm Size	-.040	.046	-.466	-.865	.420

a. Dependent Variable: sqres

Source: Author (2025)

4.6.4 Linearity Test Results

The results of the linearity test are shown in Table 4.11. According to the results, the level of significance for the relationship between Credit Risk Assessment and Performance was 0.325 while the deviation from linearity is also 0.946 indicating the absence of a linear relationship and a lack of significant deviation from linearity. Additionally, the level of significance for the relationship between Credit Risk Monitoring and Performance was 0.377 while the deviation from linearity is also 0.446 indicating the absence of a linear relationship and a lack of significant deviation from linearity.

Further, the level of significance for the relationship between Credit Risk Identification and

Performance was 0.130 while the deviation from linearity is also 0.571 indicating the absence of a linear relationship and a lack of significant deviation from linearity. The level of significance of the relationship between Credit Risk Control and Performance was 0.467 while the deviation from linearity was 0.142 indicating the absence of a linear relationship and a lack of significant deviation from linearity. Lastly, the level of significance for the relationship between Firm Value and Performance was 0.510 while the deviation from linearity is also 0.400 indicating the absence of a linear relationship as well as a lack of significant deviation from linearity.

Table 4. 12: Linearity Test Results

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Performance * Credit Risk Assessment	Between Groups	(Combined)	.383	3	.128	.404	.755
		Linearity	.348	1	.348	1.098	.325
		Deviation from Linearity	.036	2	.018	.056	.946
	Within Groups		2.533	8	.317		
	Total		2.917	11			
Performance * Credit Risk Monitoring	Between Groups	(Combined)	.417	2	.208	.750	.500
		Linearity	.240	1	.240	.865	.377
		Deviation from Linearity	.176	1	.176	.635	.446
	Within Groups		2.500	9	.278		
	Total		2.917	11			
Performance * Credit Risk Identification	Between Groups	(Combined)	.750	2	.375	1.558	.262
		Linearity	.667	1	.667	2.769	.130
		Deviation from Linearity	.083	1	.083	.346	.571
	Within Groups		2.167	9	.241		
	Total		2.917	11			
Performance * Credit Risk Control	Between Groups	(Combined)	1.202	3	.401	1.870	.213
		Linearity	.125	1	.125	.583	.467
		Deviation from Linearity	1.077	2	.539	2.514	.142
	Within Groups		1.714	8	.214		
	Total		2.917	11			

Performance * Firm Size	Between Groups	(Combined)	.702	3	.234	.846	.506
		Linearity	.132	1	.132	.476	.510
		Deviation from Linearity	.571	2	.285	1.031	.400
	Within Groups		2.214	8	.277		
	Total		2.917	11			

Source: Author (2025)

4.7 Multiple Regression Analysis

Multiple linear regression is a statistical technique that is conducted in order to forecast the values of an outcome variable, Y , given a collection of explanatory variables (Jeon, 2015). The following sections discuss the results of the multiple regression analyses, starting with the overall regression model and then the regression models pertaining to each of the explanatory variables in turn.

4.7.1 Overall Regression Model

The results of the analysis of the overall regression model are discussed in this section. The first aspect of the analysis featured the model fitting information, which is presented in Table 4.13 and shows the -2 Log Likelihood for an intercept only (or null) model and the Full model (containing the full set of predictors); as well as a Chi-Square test to test whether there is a significant improvement in fit of the Final Model relative to the intercept only model. According to the results, the model shows a significant improvement in fit of the Final model relative to the intercept only model [$\chi^2(10) = 89.077$, $p < 0.05$]. The second aspect of the analysis is the goodness-of-fit, whose results, which are presented in Table 4.14, indicate that the level of significance for both the Pearson and the Deviance are > 0.05 indicating an insignificant relationship and confirming an acceptable Goodness-of-Fit for the model, that is, that the model fits the data well as suggested by Field (2018). The last aspect of the analysis is the Pseudo R-Square, whose results, which are presented in Table 4.15, indicate that the model can explain up to 91.5% of the variation in the dependent variable (as represented by the Nagelkerke value).

Additionally, we can observe from the parameter estimates in Table 4.16 that the Odds Ratios (ORs) under Exp (B), are 0.171, 0.765, 3.752, and 2.437, respectively for credit risk assessment, credit risk monitoring, credit risk identification, and credit risk control. Since the ORs for credit assessment and credit risk monitoring are both < 1 , this indicates lower

odds of these variables falling into a higher category; whereas given that the ORs for credit risk identification and credit risk control are > 1 , this indicates higher odds of these variables falling into higher category. The p-values for these variables are 0.000, 0.517, 0.005, and 0.074, respectively, indicating that Credit Risk Assessment and Credit Risk Identification have a significant impact on the likelihood of belonging to a higher category of Performance; whereas Credit Risk Monitoring and Credit Risk Control do not have a significant impact on the likelihood of belonging to a higher category of Performance. The Beta (B) coefficients for the four variables are -1.765, -0.268, 1.322 and 0.891, respectively, indicating that Credit Risk Assessment and Credit Risk Monitoring decrease the log-odds of being in a higher Performance category; whereas Credit Risk Identification and credit Risk Control increase the log-odds of being in a higher Performance category.

Table 4. 13: Model Fitting Information – Overall Regression Model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	98.944			
Final	9.867	89.077	10	.000

Link function: Logit.

Source: Author (2025)

Table 4. 14: Goodness of Fit – Overall Regression Model

	Goodness-of-Fit		
	Chi-Square	df	Sig.
Pearson	6.507	6	.369
Deviance	6.194	6	.402

Link function: Logit.

Source: Author (2025)

Table 4. 15: Pseudo R-Square – Overall Regression Model

Cox and Snell	.686
Nagelkerke	.915
McFadden	.837

Link function: Logit.

Source: Author (2025)

Table 4. 16: Parameter Estimates

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold [Performance=4.00]	.773	1.9993	-3.146	4.691	.149	1	.699	2.166	.043	108.996
Credit Risk Assessment	-									
	1.765	.5023	-2.749	-.780	12.344	1	.000	.171	.064	.458
Credit Risk Monitoring	-.268	.4142	-1.080	.543	.420	1	.517	.765	.340	1.722
Credit Risk Identification	1.322	.4706	.400	2.245	7.896	1	.005	3.752	1.492	9.436
Credit Risk Control	.891	.4991	-.088	1.869	3.183	1	.074	2.437	.916	6.481
(Scale)	1 ^a									

Dependent Variable: Performance

Model: (Threshold), Credit Risk Assessment, Credit Risk Monitoring, Credit Risk Identification, Credit Risk Control

a. Fixed at the displayed value.

4.7.2 Credit Risk Assessment Regression Model

The results of the analysis of the credit risk assessment regression model are discussed in this section. The first aspect of the analysis featured the model fitting information, which is presented in Table 4.17. According to the results, the model shows a significant improvement in fit of the Final model relative to the intercept only model [$\chi^2(3) = 10.901$, $p < 0.05$]. The second aspect of the analysis is the goodness-of-fit, whose results, which are presented in Table 4.18, indicate that the level of significance for both the Pearson and the Deviance are > 0.05 indicating an insignificant relationship and confirming an acceptable Goodness-of-Fit for the model, that is, that the model fits the data well as suggested by Field (2018). Finally, the last aspect of the analysis is the Pseudo R-Square, whose results, which are presented in Table 4.19, indicate that the model can explain up to 17.6% of the variation in the dependent variable (as represented by the Nagelkerke value).

Additionally, we can observe from the parameter estimates in Table 4.20 that the Odds Ratio (OR) under Exp (B), for Credit Risk Assessment is 0.481, which is < 1 and indicates lower odds of this variable falling into a higher category. The p-value for this variable is 0.17 indicating that it has a significant impact on the likelihood of belonging to a higher category of Performance. The Beta coefficient for this variable is -0.732 indicating that it decreases the log-odds of being in a higher Performance category.

Table 4. 17: Model Fitting Information – Credit Risk Assessment Regression Model

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
-------	-------------------	------------	----	------

Intercept Only	21.424			
Final	10.523	10.901	3	.012

Link function: Logit.

Source: Author (2025)

Table 4. 18: Goodness-of-Fit – Credit Risk Assessment Regression Model

Goodness-of-Fit			
	Chi-Square	Df	Sig.
Pearson	0.165	0	0.102
Deviance	0.254	0	0.413

Link function: Logit.

Source: Author (2025)

Table 4. 19: Pseudo R-Square – Credit Risk Assessment Regression Model

Pseudo R-Square	
Cox and Snell	.132
Nagelkerke	.176
McFadden	.102

Link function: Logit.

Source: Author (2025)

Table 4. 20: Parameter Estimates for Credit Risk Assessment

Parameter Estimates										
			95% Wald Confidence Interval		Hypothesis Test			95% Wald Confidence Interval for Exp(B)		
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower	Upper
[Performance=4.00]	-									
Threshold	2.631	1.1785	-4.941	-.321	4.984	1	.026	.072	.007	.725
Credit Risk Assessment (Scale)	-.732	.3058	-1.331	-.132	5.727	1	.017	.481	.264	.876

Dependent Variable: Performance

Model: (Threshold), Credit Risk Assessment

a. Fixed at the displayed value.

4.7.3 Credit Risk Monitoring Regression Model

The results of the analysis of the credit risk monitoring regression model are discussed in this section. The first aspect of the analysis featured the model fitting information, which is presented in Table 4.21. According to the results, the model shows a significant

improvement in fit of the Final model relative to the intercept only model [$\chi^2(2) = .631$, $p < 0.05$]. The second aspect of the analysis is the goodness-of-fit, whose results, which are presented in Table 4.22, indicate that the level of significance for both the Pearson and the Deviance are > 0.05 indicating an insignificant relationship and confirming an acceptable Goodness-of-Fit for the model, that is, that the model fits the data well as suggested by Field (2018). Finally, the last aspect of the analysis is the Pseudo R-Square, whose results, which are presented in Table 4.23, indicate that the model can explain up to 11% of the variation in the dependent variable (as represented by the Nagelkerke value).

Additionally, we can observe from the parameter estimates in Table 4.24 that the Odds Ratio (OR) under Exp (B), for Credit Risk Monitoring is 0.944, which is < 1 and indicates lower odds of this variable falling into a higher category. The p-value of this variable is 0.861 indicating that it does not have a significant impact on the likelihood of belonging to a higher category of Performance. The Beta coefficient for this variable is -0.058 indicating that it decreases the log-odds of being in a higher Performance category.

Table 4. 21: Model Fitting Information – Credit Risk Monitoring Regression Model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	11.551			
Final	10.920	.631	2	.004

Link function: Logit.

Source: Author (2025)

Table 4. 22: Goodness-of-Fit – Credit Risk Monitoring Regression Model

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	0.388	0	0.155
Deviance	0.482	0	0.367

Link function: Logit.

Source: Author (2025)

Table 4. 23: Pseudo R-Square: Credit Risk Monitoring Regression Model

Pseudo R-Square	
Cox and Snell	.008
Nagelkerke	.011
McFadden	.006

Link function: Logit.

Source: Author (2025)

Table 4. 24: Parameter Estimates for Credit Risk Monitoring

		Parameter Estimates									
				95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
Parameter		B	Std. Error	Lower	Upper	Wald Chi- Square	df	Sig.		Lower	Upper
Threshold	[Performance= 4.00]	-.101	1.3336	-2.714	2.513	.006	1	.940	.904	.066	12.346
Credit Risk Monitoring (Scale)		.058	.3297	-.704	.588	.031	1	.861	.944	.495	1.801
		1 ^a									

Dependent Variable: Performance
Model: (Threshold), Credit Risk Monitoring

a. Fixed at the displayed value.

4.7.4 Credit Risk Identification Regression Model

The results of the analysis of the credit risk identification regression model are discussed in this section. The first aspect of the analysis featured the model fitting information, which is presented in Table 4.25. According to the results, the model shows a significant improvement in fit of the Final model relative to the intercept only model [$\chi^2(3) = 26.921$, $p < 0.05$]. The second aspect of the analysis is the goodness-of-fit, whose results, which are presented in Table 4.26, indicate that the level of significance for both the Pearson and the Deviance are > 0.05 indicating an insignificant relationship and confirming an acceptable Goodness-of-Fit for the model, that is, that the model fits the data well as suggested by Field (2018). Finally, the last aspect of the analysis is the Pseudo R-Square, whose results, which are presented in Table 4.27, indicate that the model can explain up to 39.4% of the variation in the dependent variable (as represented by the Nagelkerke value).

Additionally, we can observe from the parameter estimates in Table 4.28 that the Odds Ratio (OR) under Exp (B), for Credit Risk Identification is 2.338, which is > 1 and indicates higher odds of this variable falling into a higher category. The p-value for this variable is 0.015 indicating that it has a significant impact on the likelihood of belonging to a higher category of Performance. The beta coefficient for this variable is 0.849 indicating that it increases the log-odds of being in a higher Performance category.

Table 4. 25: Model Fitting Information – Credit Risk Identification Regression Model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	34.347			
Final	7.426	26.921	3	.000

Link function: Logit.
Source: Author (2025)

Table 4. 26: Goodness-of-Fit – Credit Risk Identification Regression Model

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	0.189	0	0.428
Deviance	0.359	0	0.386

Link function: Logit.
Source: Author (2025)

Table 4. 27: Pseudo R-Square – Credit Risk Identification Regression Model

Pseudo R-Square	
Cox and Snell	.295
Nagelkerke	.394
McFadden	.253

Link function: Logit.
Source: Author (2025)

Table 4. 28: Parameter Estimates for Credit Risk Identification

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold [Performance=4.00]	3.372	1.3694	.688	6.056	6.063	1	.014	29.137	1.990	426.690
Credit Risk Identification (Scale)	.849	.3503	.162	1.536	5.875	1	.015	2.338	1.176	4.645

Dependent Variable: Performance
Model: (Threshold), Credit Risk Identification
a. Fixed at the displayed value.

4.7.5 Credit Risk Control Regression Model

The results of the analysis of the credit risk control regression model are discussed in this section. The first aspect of the analysis featured the model fitting information, which is

presented in Table 4.29. According to the results, the model shows a significant improvement in fit of the Final model relative to the intercept only model [$\chi^2(3) = 26.213$, $p < 0.05$]. The second aspect of the analysis is the goodness-of-fit, whose results, which are presented in Table 4.30, indicate that the level of significance for both the Pearson and the Deviance are > 0.05 indicating an insignificant relationship and confirming an acceptable Goodness-of-Fit for the model, that is, that the model fits the data well as suggested by Field (2018). Finally, the last aspect of the analysis is the Pseudo R-Square, whose results, which are presented in Table 4.31, indicate that the model can explain up to 38.5% of the variation in the dependent variable (as represented by the Nagelkerke value).

Additionally, we can observe from the parameter estimates in Table 4.32 that the Odds Ratio (OR) under Exp (B), for Credit Risk Control is 1.224, which is > 1 and indicates higher odds of this variable falling into a higher category. The p-value for this variable is 0.506 indicating that it does not have a significant impact on the likelihood of belonging to a higher category of Performance. The beta coefficient for this variable is 0.202 indicating that it increases the log-odds of being in a higher Performance category.

Table 4. 29: Model Fitting Information – Credit Risk Control Regression Model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	33.589			
Final	7.376	26.213	3	.000

Link function: Logit.

Source: Author (2025)

Table 4. 30: Goodness-of-Fit – Credit Risk Control Regression Model

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	0.187	0	0.276
Deviance	0.265	0	0.386

Link function: Logit.

Source: Author (2025)

Table 4. 31: Pseudo R-Square – Credit Risk Control Regression Model

Pseudo R-Square	
Cox and Snell	.289
Nagelkerke	.385

Table 4. 32: Parameter Estimates for Credit Risk Control

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold [Performance=4.00]	.876	1.1463	-1.371	3.123	.584	1	.445	2.402	.254	22.710
Credit Risk Control (Scale)	.202	.3037	-.393	.797	.442	1	.506	1.224	.675	2.220
	1 ^a									

Dependent Variable: Performance

Model: (Threshold), Credit Risk Control

a. Fixed at the displayed value.

4.7.6 Moderation Effect of Firm Size

The results of the analysis of the moderation effect of the firm size regression model are discussed in this section. The ordinal logistic regression equation pertaining to the moderation effect is as follows:

$$\log \left(\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right) = \alpha_j + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_1 \times X_5 + \beta_6 X_2 \times X_5 + \beta_7 X_3 \times X_5 + \beta_8 X_4 \times X_5$$

The beta coefficients were extracted from Table 4.16 showing the parameter estimates for the overall regression model. According to the table the moderation coefficient (interaction 1) is 0.038. Therefore, by substitution into the above equation, we have the following:

$$\begin{aligned} \log \left(\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right) &= -1.657 - 1.765X_1 - 0.268X_2 + 1.322X_3 + 0.891X_4 - (1.987X_1 \times 0.038) - \\ &\quad (0.498X_2 \times 0.038) + (0.803X_3 \times 0.038) + (0.710X_4 \times 0.038) = -1.657 - 1.765X_1 \\ &\quad - 0.268X_2 + 1.322X_3 + 0.891X_4 - 0.076X_1 - 0.019X_2 + 0.031X_3 + 0.027X_4 \\ &= -1.657 - 1.841X_1 - 0.287X_2 + 1.353X_3 + 0.918X_4 \end{aligned}$$

It is clear from the above that the coefficients for the first two independent variables (Credit Risk Assessment and Credit Risk Monitoring) have reduced in magnitude as a result of the moderation while those of Credit Risk Identification and Credit Risk Control have increased. This is an indicator that moderation of firm size has a positive effect on Credit Risk Identification and Credit Risk

Control but a negative effect on Credit Risk Assessment and Credit Risk Monitoring.

Table 4. 33: Parameter Estimates for Moderation Effect of Firm Size

Parameter Estimates										
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold [Performance=4.00]	-1.657	6.6909	-14.770	11.457	.061	1	.804	.191	3.848E-07	94594.001
Credit Risk Assessment	-1.987	1.3788	-4.690	.715	2.077	1	.150	.137	.009	2.045
Credit Risk Monitoring	-.498	1.1119	-2.677	1.681	.201	1	.654	.608	.069	5.371
Credit Risk Identification	.803	1.4769	-2.092	3.697	.295	1	.587	2.232	.123	40.343
Credit Risk Control	.710	1.2855	-1.809	3.230	.305	1	.581	2.035	.164	25.277
Interaction1 (Scale)	.038	.0716	-.103	.178	.278	1	.598	1.038	.903	1.195

Dependent Variable: Performance

Model: (Threshold), Credit Risk Assessment, Credit Risk Monitoring, Credit Risk Identification, Credit Risk Control, Interaction1

a. Computed based on the deviance.

4.8 Chapter Summary

This chapter covered the presentation of the research findings. These included the response rate, the demographic characteristics of the respondents, the descriptive analyses, the diagnostic test results, and the inferential analyses. The demographic characteristics featured the title of the respondents, the length of employment, and the familiarity with credit risk management processes. The descriptive analyses comprised means and standard deviation findings on each of the variables, including credit risk assessment, credit risk monitoring, credit risk identification, credit risk control, firm value, and performance. The diagnostic test results included multicollinearity test, normality test, heteroscedasticity test, and linearity test results. Inferential analyses featured Pearson Correlation Coefficient and Multiple Regression Analyses. The next chapter will deal with the summary, conclusions and recommendations.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter features the summary of the findings, a description of the derived conclusions; and an articulation of the recommendations that will be as a consequence of the conclusions. It also includes suggestions for further studies, implications of the study, and limitations of the study.

5.2 Summary of the Main Results

The first objective of the study was to establish the effect of credit risk assessment on the performance of agricultural cooperatives in Nairobi Metropolitan Area. Credit risk assessment was found to be positively and significantly correlated with performance. The second objective was to determine the effect of credit risk monitoring on the performance of agricultural cooperatives in Nairobi metropolitan area. The study found that credit risk monitoring was positively and significantly correlated with performance. The third objective was to examine the effect of credit risk identification on the performance of agricultural cooperatives in Nairobi Metropolitan area. According to the results, credit risk identification was positively and significantly correlated with performance. The fourth objective was to ascertain the moderating effect of firm size on the relationship between credit risk management and the performance of agricultural cooperatives in Nairobi metropolitan area. The study found that firm size has a positive and significant moderating effect on the relationship between credit risk management and the performance of agricultural cooperatives in Nairobi metropolitan area.

5.3 Discussion of the Results

5.3.1 Credit Risk Assessment and Performance

The study found a positive and significant relationship between credit risk assessment and performance indicating that credit risk assessment improves the operational performance of agricultural cooperatives in Kenya. The implication is that agricultural cooperatives which invested in credit risk assessment were more inclined to experience improved performance. By leveraging on credit assessment capabilities, agricultural cooperatives can ensure the

improvement of performance. The study established strong linkages with the Credit Risk Theory since financial institutions including agricultural cooperatives are able to evaluate the likelihood of borrower default and manage financial stability, through the use of credit risk assessments which was consistent with Bilal and Baig (2019). However, Çallı and Coşkun (2021) argued that the theory relies on historical data and statistical models, which may not capture unexpected economic shocks or black swan events, such as financial crises.

The above results were consistent with Brahmaiah (2022), Ogundele and Nzama (2025), and Imbuye and Miroga (2023); however, they contradicted Solanki et al. (2023), Gobbilla and Nandini (2025), and Sudi and Musiega (2020). The reasons for the contradictions were: whilst the risk assessment was necessary, it was more important for the cooperatives to measure the risks and prepare a risk profile; robust internal credit frameworks and technological tools which were critical towards the reductions of non-performing loans and improving financial stability; and the most effective credit risk mitigation process for MFIs were the stabilisation of liquidity control measures and controlling loan default rates. The results also affirmed the Credit Risk Theory given that the theory offers an explanation as to how the societies can best manage credit risk exposure.

5.3.2 Credit Risk Monitoring and Performance

The study found that there was a positive and significant relationship between credit risk monitoring and performance. The implication is that agricultural cooperatives that integrate effective credit risk monitoring process will experience enhanced performance. By leveraging appropriate credit risk monitoring process agricultural cooperatives can ensure that their performances are optimized. The study was linked to the Credit Risk Theory given that agricultural cooperatives can use this theory to develop appropriate credit monitoring techniques that ensure review and follow-up for suitable corrective action whenever issues arise during the credit repayment process which corroborated the findings of Naili and Lahrichi (2022). Conversely, Bouteille and Coogan-Pushner (2021) argued that the problem of information asymmetry, where borrowers may hide financial distress, makes risk models unreliable and rendering credit risk monitoring to be futile.

These findings were aligned with Kiprono and Njeru (2022), Gitau (2021), and Olajide (2024). However, they contrasted with Umeorah et al. (2024), Neelakanta et al. (2025), and Ali and Ndede (2024) owing to: most financial institutions had ensured the integration of

modern credit risk monitoring techniques including machine learning which had made the process more precise and proactive; the adoption of digital solutions to credit management by microfinance institutions has been hampered by poor digital infrastructure, lack of basic computer knowledge by the average customers, and regulatory limitations; and preventive credit management techniques such as the integration of internal control systems and audits, management competency, and capital adequacy were all critical towards the improvement of financial performance. Furthermore, the findings are aligned with the Credit Risk Theory in terms of the congruence between credit risk monitoring techniques discussed and the postulations of the theory.

5.3.3 Credit Risk Identification and Performance

The study determined that there was a positive and significant relationship between credit risk identification and the performance of agricultural cooperatives in Kenya. The implication is that through the investment in effective credit risk identification processes, agricultural cooperatives can ensure improved performance. By leveraging the investment in credit risk identification mechanisms, agricultural cooperatives are able to attain enhanced performance. The study was able to establish strong alignment with the Credit Risk Theory since it has enabled the identification of existing and potential risks in an agricultural cooperative's loan products and associated lending activities as determined by Prastiwi and Anik (2020). Conversely, Fonseca et al. (2020) disagreed with the theory's assumption that credit risk can be quantified objectively and was found to be defective since creditworthiness assessments are often influenced by subjective judgment and biases.

The above findings were aligned with Mwanyika and Koori (2020), Mwangi et al. (2021), and Kabugu and Wamiori (2022). However, it contrasted with the findings of Obondy et al. (2025) who determined that the majority of SACCOs conduct comprehensive credit risk identification including the use of financial history reviews, credit risk checklists, scoring models and employment verification prior to the approval of loans; Paudel (2022), who found that the number of barriers to the adoption of more modern techniques of credit risk management compelled cooperatives in developing economies to stick to the conventional credit risk management techniques; and Brown (2024) who found that rather using one or the other, financial institutions should use a hybrid of AI-based techniques and those requiring human expertise so as to incorporate the merits of both categories of credit risk identification techniques. Additionally, the examined credit risk identification techniques

are consistent with those discussed under the Credit Risk Theory as well as the Credit Rationing theory.

5.3.4 Credit Risk Control and Performance

According to the results of the study, there was a positive and significant relationship between credit risk control and performance. The implication is that agricultural cooperatives that invest in credit risk control mechanisms are bound to enjoy improved performance. By leveraging the use of credit risk control mechanisms, agricultural cooperatives can attain superior performance levels since they will be able to institute systems, procedures and processes that ensure the promptness of loan repayments from clients. This study established linkages with the Credit Rationing Theory since the lending institutions are compelled to assess borrowers' discernible characteristics and loan characteristics before deciding on whether or not to advance credit. Upon completion of the credit risk assessment, risks will need to be identified and a determination made on their magnitude. Credit risk monitoring and credit risk control will only be conducted if the credit has been advanced. This was consistent with the findings of Miglo (2022). However, De Paola (2022) argued that in credit markets, asymmetric knowledge may result in an excessive provision of credit, which is sometimes referred to as excess lending.

These findings were aligned with those of Oyogo et al. (2022), Gurmessa et al. (2021), and Crawford et al. (2023). However, Gichuhi and Omagwa (2020) determined that the lack of awareness of effective credit data management techniques had hampered the adoption of these techniques by a number of SACCOs; Maina et al. (2024) established that the most critical aspect of loan insurance policies that have been adopted by DT-SACCOs is loan loss provisioning which enabled the SACCOs to have adequate levels of working capital; and Bowen and Makokha (2021) found that credit information sharing has increasingly become a more effective credit risk control mechanism employed by financial institutions rather than credit rationing. These findings are aligned with the Credit Rationing Theory in terms of the difficulties experienced by many smaller lenders in adopting credit rationing as a credit risk control mechanism.

5.3.5 Moderating Effect of Firm Size

The study found that firm size has a positive and significant moderating effect on the relationship between credit risk management processes and performance of agricultural

cooperatives. The implication is that through the integration of firm size, agricultural cooperatives can experience the enhancement of both credit risk management processes and performance. By leveraging the strengths of firm size, larger agricultural cooperatives can improve their ability to invest in credit risk management processes and enjoy improved performance as a result. The study established strong linkages with the Credit Rationing Theory given that it explains how larger and more resourced agricultural cooperatives are able to establish a higher level of liquidity which enables them to ration their credit to cover more customers.

The above findings were consistent with those of Kipai et al. (2020), Kamurar and Mbuva (2025), and Ishmail et al. (2023). However, they contradicted the findings of Sang et al. (2024) determined that firm size played a critical moderating role on the relationship between SACCOS' corporate governance and financial performance since larger SACCOs were able to recruit more qualified members into their boards; Gichinga et al. (2024) established that whilst larger organisations were capable of generating more revenue, the efficiency of the employees deteriorated beyond an optimal number of employees; and Obande et al. (2017) who determined that dairy cooperatives' characteristics such as membership size, democratic control, and level of education were strong moderators of the association between the structure of capital and performance, however, asset valuation was found to be an insignificant moderator. These findings are aligned with the Credit Rationing Theory in terms of the difficulties experienced by many smaller lenders in adopting credit rationing as a credit risk control mechanism while larger lenders are better positioned to do so.

5.4 Conclusions

The study concluded that Credit Risk Theory was strongly aligned with the first three independent variables, namely, credit risk assessment, credit risk monitoring, and credit risk identification. More specifically, the theory explains how financial institutions including agricultural cooperatives are able to evaluate the likelihood of borrower default and manage financial stability through the use of credit risk assessments; agricultural cooperatives can use this theory to develop appropriate credit monitoring techniques that ensure review and follow-up for suitable corrective action whenever issues arise during the credit repayment process; and it has enabled the identification of existing and potential risks in an agricultural cooperative's loan products and associated lending activities. The study further concluded

that the Credit Rationing Theory was strongly aligned with Credit Risk Control since the lending institutions are compelled to assess borrowers' discernible characteristics and loan characteristics before deciding on whether or not to advance credit. Additionally, the Credit Rationing Theory is aligned with Firm Size given that it explains how larger and more resourced agricultural cooperatives are able to establish a higher level of liquidity which enables them to ration their credit to cover more customers. However, the linkage between the Information Asymmetry Theory and the study variables was not established from the findings.

5.5 Recommendations

5.5.1 Policy Recommendations

The Government should reinforce its credit information sharing policies by involving key stakeholders such as Credit Reference Bureaus as well as all financial institutions including agricultural cooperatives so as to promote more responsible lending so as to enhance credit risk assessment. The Government, through the regulator (SASRA), should ensure that all cooperatives develop and adhere to comprehensive risk management policies that define their risk appetite, identification procedures and mitigation strategies. This should explicitly cover credit risk arising from loan defaults and technology risk due to rapid digitization.

5.5.2 Managerial Recommendations

The management of the cooperatives should establish robust internal loan policies and procedures to act as a first line of debt recovery including strict appraisal of loan applications on the basis of the borrower's ability to repay, and having a first lien over a member's shares or deposits that the cooperative can use to recover debts so as to boost credit risk identification, monitoring and control.

Management should maintain regular and consistent contact with borrowers throughout the loan lifecycle, not just when the payment is due through the use of multiple channels including email, SMS, and in-app messaging as a means of inducing them to continue servicing their loans, which will improve credit risk monitoring. Additionally, they can assign a dedicated point of contact such as a specific loan officer or relationship manager to handle inquiries and provide support so as to build trust and a personal connection.

Cooperative society management can institute effective credit risk identification

mechanisms through a comprehensive framework that includes robust client appraisal methods, leveraging credit reference bureaus, and ongoing loan portfolio analysis. The board of directors and management should formulate and enforce a clear credit policy that outlines lending philosophy, acceptable practices, limits, and the treatment of exceptions. This fosters a shared risk-aware mindset among all staff and members. Cooperatives should perform credit referencing by engaging with CRBs to access a potential borrower's historical credit information. This helps identify potential defaulters or those with high debt burdens, allowing the cooperative to make informed lending decisions.

In order to properly manage the application of AI-based credit identification techniques, management should create a cross-functional committee with representatives from the board, IT management, credit department, and compliance/risk officers to provide strategic oversight and ensure alignment with the society's values and regulatory requirements. Additionally, they should clearly define who is responsible for the operational performance, monitoring, and outcomes of AI models, from data scientists and IT staff to loan officers and the board.

The management of cooperatives should also institute effective credit policy and evaluation criteria such as credit worthiness assessment policies that mandate a thorough evaluation process for all loan applicants, utilizing the "CAMPARI" (Character, Ability, Margin, Purpose, Amount, Repayment, Insurance) framework or similar models to determine the borrower's risk level and ability to repay. Policies should outline the use of information security standards, end-to-end data encryption, regular security assessments, and employee training to safeguard against cyber threats.

5.5.3 Contribution to Knowledge

The study makes methodological contributions to existing body of knowledge through the adoption of ordinal logistic regression analysis as opposed to the more common multiple regression analysis. The use of data from agricultural cooperatives in Kenya also provides a more nuanced perspective of credit risk management processes offering insights into causal mechanisms behind challenges experienced by these organisations in optimising credit risk management as a means of enhancing their performance. The examination of the moderation effects of firm size further augments this perspective.

5.5.4 Implications for Academia and Research

Given the scarcity of local research contextualized on agricultural cooperatives, this study will provide a foundation for building the body of knowledge on the influence of credit risk management processes on the performance of agricultural cooperatives in Kenya. Furthermore, the introduction of firm size as a moderating variable has provided additional insights that were missing from other studies on credit risk management.

5.6 Limitations of the Study

This study has been limited by a specific focus on agricultural cooperatives, in mitigation, it is recommended that other studies be conducted on other types of cooperatives. This study was also limited by the use of positivism research philosophy combined with a quantitative research design, in mitigation, other researchers should consider other research paradigms such as pragmatism combined with mixed methods approaches.

5.7 Suggestions for Further Studies

This study has focused on four credit risk management processes, given that this is not exhaustive, future research should be focused on other credit risk management processes. This study has been focused on firm size as a moderating variable; future researchers should investigate the effect of other moderators on the relationship between credit risk management processes and performance. Additionally, this study has been contextualized on agricultural cooperatives, future research should consider other contexts such as banks and not-for-profit organizations that lends to farmers.

REFERENCES

- Addo, K. (2022). Agricultural credit provision: what really determines farmers' participation and credit rationing? *Agricultural Finance Review*, 77(2), 239-256.
- Adegbe, F. F., & Otitolaiye, E. D. (2020). Credit risk and financial performance: an empirical study of deposit money banks in Nigeria. *European journal of accounting, auditing and finance research*, 8(2), 38-58.
- Adhikari, A., & Zhou, H. (2022). Voluntary disclosure and information asymmetry: do investors in US capital markets care about carbon emission? *Sustainability Accounting, Management and Policy Journal*, 13(1), 195-220.
<https://doi.org/10.1108/SAMPJ-02-2020-0046>
- Aduda, J., & Obondy, S. (2021). Credit risk management and efficiency of savings and credit cooperative societies: A review of literature. *Journal of Applied Finance and Banking*, 11(1), 99-120. <https://doi.org/10.47260/jafb/1117>
- Agri Frontier (2024). Navigating the Credit Flow Landscape in Kenya's Agriculture Sector.https://www.agrifrontier.com/case-study/credit-flow-landscape/?utm_source=chatgpt.com.
- Akerlof, G. A. (1970). The market for lemons: Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3), 488-500.
<https://doi.org/10.2307/1879431>
- Al Zaidanin, J. S., & Al Zaidanin, O. J. (2021). The impact of credit risk management on the financial performance of United Arab Emirates commercial banks. *International Journal of Research in Business and Social Science*, 10(3), 303-319.
<https://doi.org/10.20525/ijrbs.v10i3.1102>
- Ali, D. E., & Ndede, F. W. (2024). Credit management practices and financial performance of deposit taking savings and credit co-operative societies in Marsabit County, Kenya. *International Academic Journal of Economics and Finance*, 4(3), 410-446.
https://iajournals.org/articles/iajef_v4_i3_410_446.pdf
- Ali, S. A., & Kutan, A. M. (2022). The impact of monetary policy on inflation targeting in low-income countries. *Journal of Economic Policy*, 45(3), 155-173.
<https://doi.org/10.1016/j.jep.2022.03.001>
- Alliance for a Green Revolution in Africa (2019). *2019 Annual Report: Integration and scale: Transforming the livelihoods and lives of smallholder farmers in Africa*.

Retrieved from <https://agra.org/wp-content/uploads/2021/03/AGRA-Annual-Report-Web-2019-26-06-20.pdf>

- Altman, E. I., Sabato, G., & Wilson, N. (2010). The value of non-financial information in small and medium-sized enterprise risk management. *Journal of Credit Risk*, 6(2), 95-127.
- Amunabi, E. K., & Koori, J. (2018). Credit risk management and loan portfolio performance among deposit taking savings and credit co-operative societies in Nairobi City, Kenya. *The Strategic Journal of Business and Change Management*, 5(2), 2489-2502. <https://doi.org/10.61426/sjbcm.v5i2.790>
- Andreas, W. R. (2021). Banks and economic growth: The general theory in a basic disequilibrium model with five rationing regimes. *Review of Business and Economics Studies*, (4), 9-22. <https://doi.org/10.26794/2308-944X-2021-9-4-9-22>
- Angweye, E. I., & Otinga, H. N. (2019). Influence of loan insurance policy on financial performance of Savings and Credit Cooperatives in Kakamega County, Kenya. *The Strategic Journal of Business & Change Management*, 7(1), 150-159.
- Araújo, A. M. B., & Lustosa, P. R. B. (2020). The cyclicity of loan loss provisions under three different accounting models: The United Kingdom, Spain, and Brazil. *arXiv preprint arXiv:1907.07491*. Access: https://www.researchgate.net/publication/334534603_The_cyclicity_of_loan_loss_provisions_under_three_different_accounting_models_the_United_Kingdom_Spain_and_Brazil
- Arrow, K. J. (2013). Uncertainty and the welfare economics of medical care. *The American Economic Review*, 53(5), 941–973.
- Baisero, A., & Amato, C. (2021). Unbiased asymmetric reinforcement learning under partial observability. *arXiv preprint arXiv:2105.11674*. <https://doi.org/10.48550/arXiv.2105.11674>
- Bakti, N. S. (2022). Analysis of the Influence of DPK, Car, Roa and NPF on Financing in Sharia Banking. *Institutional Repositories*.
- Balana, B. B., & Oyeyemi, M. A. (2022). Agricultural credit constraints in smallholder farming in developing countries: Evidence from Nigeria. *World Development Sustainability*, 1, 100012. <https://doi.org/10.1016/j.wds.2022.100012>
- Balongo, C. V. (2024). Impact of innovation and agricultural cooperative societies towards ecological equilibrium among rural farmers in Kenya. *Journal of the Kenya National Commission for UNESCO*, 4(2), 1-14. <https://doi.org/10.62049/jkncu.v4i2.112>

- Barasa, M., Tibbs, C., & Shitseswa, A. (2023). Influence of debt restructuring strategy implementation on performance of selected commercial banks in Kisumu Kenya. *African Journal of Empirical Research*, 4(2), 734-744. <https://doi.org/10.51867/ajernet.4.2.74>
- Bielecki, T. R., & Rutkowski, M. (2002). *Credit risk: Modelling, valuation and hedging*. Springer.
- Bilal, A. R., & Baig, M. M. (2021). Transformation of agriculture risk management. *Agricultural Finance Review*, 79(1), 136-155. <https://doi.org/10.1108/AFR-05-2018-0038>
- Bizikova, L., Minah, M., & Zoundi, Z. (2025). Agricultural cooperatives. In Neal K. Van Alfen (Eds), *Encyclopaedia of Agriculture and Food Systems* (pp.71-80). Academic Press. <https://doi.org/10.1016/B978-0-443-15976-3.00081-7>
- Bouteille, S., & Coogan-Pushner, D. (2021). *The handbook of credit risk management: originating, assessing, and managing credit exposures*. John Wiley & Sons.
- Bowen, N. J., & Makokha, E. N. (2021). Effects of credit information sharing on performance of savings and credit cooperative societies in Kenya. *International Journal of Recent Research in Commerce Economics and Management (IJRRCEM)*, 8(1), 109-120.
- Brahmaiah, B. (2022). Credit risk assessment practices of Indian banking industry: An empirical study. *International Journal of Economics and Financial Issues*, 12(2), 67–71. <https://doi.org/10.32479/ijefi.12968>
- Brown, M. (2024). Influence of artificial intelligence on credit risk assessment in banking sector. *International Journal of Modern Risk Management*, 2(1), 24-33. <https://doi.org/10.47604/ijmrm.2641>
- Çallı, B. A., & Coşkun, E. (2021). A longitudinal systematic review of credit risk assessment and credit default predictors. *Sage Open*, 11(4), 21582440211061333. <https://doi.org/10.1177/21582440211061333>
- CBK. (2019). *Bank Supervision Report*. Nairobi: Central Bank of Kenya. Retrieved from https://www.centralbank.go.ke/uploads/399346751_2015%20.pdf
- CBK (2025). *Agricultural Sector Survey – March 2025*. Nairobi: Central Bank of Kenya. Retrieved from https://www.centralbank.go.ke/uploads/market_perception_surveys/967642160_Agriculture%20Survey%20March%202025.pdf

- Cervantes, J. Z., Dakina, I., Modasir, H. L., Monteza, M. G., Ocor, J. D., Orillo, E. P. E., & Fuentes, J. (2023). *Sustainability of agricultural cooperatives: A comprehensive analysis*. [https://doi.org/10.13140/RG2\(25037.82405\)](https://doi.org/10.13140/RG2(25037.82405)).
- Chod, J., & Lyandres, E. (2021). A theory of ICOs: Diversification, agency, and information asymmetry. *Management Science*, 67(10), 5969-5989. <https://doi.org/10.1287/mnsc.2020.3754>
- Conțu, E. G. (2020, July). Organizational performance—theoretical and practical approaches; study on students' perceptions. In *Proceedings of the International Conference on Business Excellence* (Vol. 14, No. 1, pp. 398-406). Sciendo. <https://doi.org/10.2478/picbe-2020-0038>
- Crawford, J., Cui, Z. Y. A., & Kewley, D. (2023). Government finance, loans, and guarantees for small and medium enterprises (SMEs) (2000–2021): A systematic review. *Journal of Small Business Management*, 62(5), 2607–2637. <https://doi.org/10.1080/00472778.2023.2246061>
- Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. *Nurse researcher*, 23(6), 20-25. <https://doi.org/10.7748/nr.2016.e1382>
- Cutler, D. M., & Zeckhauser, R. J. (2000). The anatomy of health insurance. In A. J. Culyer & J. P. Newhouse (Eds.), *Handbook of Health Economics* (Vol. 1, pp. 563–643).
- De Paola, L. (2022). *Credit rationing: literature review and empirical evidence in the survey on access to finance of enterprises* (Master's thesis, Politecnico de Torino).
- Dhakal, D., O'Brien, D., & Mueser, P. (2021). Government policy and performance of agricultural cooperatives: A case study in Chitwan district, Nepal. *Sustainability*, 13(21), 12282. <https://doi.org/10.3390/su132112282>
- Di Leo, G., & Sardanelli, F. (2020). Statistical significance: p value, 0.05 threshold, and applications to radiomics—reasons for a conservative approach. *European radiology experimental*, 4, 1-8. <https://doi.org/10.1186/s41747-020-0145-y>
- e Saqib, S., Ahmad, M. M., Panezai, S., & Ali, U. (2016). Factors influencing farmers' adoption of agricultural credit as a risk management strategy: The case of Pakistan. *International journal of disaster risk reduction*, 17, 67-76. <https://doi.org/10.1016/j.ijdrr.2016.03.008>
- Emran, M. S., Mookherjee, D., Shilpi, F., & Uddin, M. H. (2021). Credit rationing and pass-through in supply chains: theory and evidence from Bangladesh. *American Economic Journal: Applied Economics*, 13(3), 202-236. <https://doi.org/10.1257/app.20190083>

- Evoney, G. D., & Margaretha, F. (2024). The effect of credit risk management on the financial performance of banks listed on the IDX. *Jurnal Ilmiah Manajemen Kesatuan*, 12(2), 933-938. <https://doi.org/10.37641/jimkes.v12i4.2658>
- Etenyi, P. H., Nelima, M., & Maingi, M. (2024). Effect of credit risk management techniques on financial performance of deposit taking SACCOs in Kenya. *African Journal of Empirical Research*, 5(4), 317-331. <https://doi.org/10.51867/ajernet.5.4.25>
- Fischer, H. E., Boone, W. J., & Neumann, K. (2023). Quantitative research designs and approaches. In *Handbook of research on science education* (pp. 28-59). Routledge.
- Fonseca, D. P., Wanke, P. F., & Correa, H. L. (2020). A two-stage fuzzy neural approach for credit risk assessment in a Brazilian credit card company. *Applied Soft Computing*, 92, 106329. <https://doi.org/10.1016/j.asoc.2020.106329>
- Food and Agriculture Organisation (2021). *Agricultural cooperatives, responsible sourcing and risk-based due diligence*. Retrieved from <https://openknowledge.fao.org/server/api/core/bitstreams/a33b508d-9429-4f01-b6a2-eba1be940f79/content>
- Food and Agriculture Organisation (2024). *Agricultural production statistics 2010–2023*. Retrieved from <https://www.fao.org/statistics/highlights-archive/highlights-detail/agricultural-production-statistics-2010-2023/en>
- Freimer, M., & Gordon, M. J. (1965). Why bankers ration credit. *The Quarterly Journal of Economics*, 79(3), 397-416.
- Ghoujdam, K. M., Chaabita, R., Elkhalfi, O., Zehraoui, K., Elalaoui, H., & Idamia, S. (2024). Consumer credit risk analysis through artificial intelligence: a comparative study between the classical approach of logistic regression and advanced machine learning techniques. *Cogent Economics & Finance*, 12(1). <https://doi.org/10.1080/23322039.2024.2414926>
- Gichinga, R. N., Gatauwa, J., Kimutai, C. (2024). SASRA moderation effect between firm characteristics and firm efficiency of deposit taking savings and credit cooperatives societies in Kenya. *International Academic Journal of Economics and Finance*, 4(1), 345-367.
- Gichuhi, A. W., & Omagwa, J. (2020). Credit management and loan portfolio performance of savings and credit cooperative societies in Nyandarua County, Kenya. *International Academic Journal of Economics and Finance*, 3(5), 121-139.

- Gitau, B. N. (2019). Influence of credit management on financial performance of dairy marketing cooperatives in Kenya. *The Strategic Journal of Business & Change Management*, 6(3), 227-236. Retrieved from <https://www.strategicjournals.com/index.php/journal/article/view/1296/1271>
- Giudici, P., Hadji-Misheva, B., & Spelta, A. (2020). Network based credit risk models. *Quality Engineering*, 32(2), 199–211. <https://doi.org/10.1080/08982112.2019.1655159>
- Gobbilla, U., & Nandini, C. (2025). The role of credit risk management in mitigating NPA. *International Journal of Advanced Engineering, Management and Science*, 11(4), 619945. <https://doi.org/10.22161/ijaems.114.19>
- Gonzalez-Vega, C. (2021). Credit-rationing behavior of agricultural lenders: the iron law of interest-rate restrictions. In *Undermining rural development with cheap credit* (pp. 78-95). Routledge.
- Goyder, J. (1985). Face-to-face interviews and mailed questionnaires: The net difference in response rate. *Public Opinion Quarterly*, 49(2), 234-252. <https://doi.org/10.1086/268917>
- Gurmessa, N. E., Ndinda, C., Agwanda, C., & Akiri, M. (2021). Partial credit guarantee and financial additionality for smallholders coffee cooperatives: experience from Ethiopia. *Development in Practice*, 32(8), 1049–1062. <https://doi.org/10.1080/09614524.2021.1958161>
- Hamilton, S. (2020). Crop Insurance and the New Deal Roots of Agricultural. *Enterprise & Society*, 21(3), 648-680.
- Hashmi, S. D., Gulzar, S., Ghafoor, Z., & Naz, I. (2020). Sensitivity of firm size measures to practices of corporate finance: evidence from BRICS. *Future Business Journal*, 6(1), 9. <https://doi.org/10.1186/s43093-020-00015-y>
- Huang, J. Z., Shi, Z., & Zhou, H. (2020). Specification analysis of structural credit risk models. *Review of Finance*, 24(1), 45-98. <https://doi.org/10.1093/rof/rfz006>
- Ifft, U. (2023). The impact of extreme weather on farm finance - evidence from Kansas. *AgEcon Search*.
- Imbuye, E. N., & Miroga, J. (2023). Credit risk management and financial performance of commercial banks in Kenya. *The Strategic Journal of Business & Change Management*, 10(3), 597–607. <https://doi.org/10.61426/sjbcm.v10i3.2728>

- Ingutia, R. A., & Sumelius, J. (2024). Family Planning, Irrigation, and Agricultural Cooperatives for Sustainable Food Security in Kenya. *Sustainable Agriculture Research*, 13(2), 16-39. <https://doi.org/10.5539/sar.v13n2p16>
- International Cooperative Alliance – Africa (2020). *Proceedings at the 11th Regional Conference on the theme of “Improving Members' Socio-Economic Situation by Encouraging the Benefits of Co-operative Enterprises”*, Intercontinental Hotel, Nairobi, Kenya (17th – 19th November 2017).
- Isabwa, H. K. (2022). Effect of mobile banking on financial inclusion among commercial banks in Kenya. *International Journal of Business Management and Economics*, 2(3), 184-197. <https://doi.org/10.47747/ijbme.v2i3.315>
- Ishak, R., Omar, R., & Khalim, A. A. M. (2025). The role of cooperatives towards empowering the national food security agenda. *PaperASIA*, 41(3b), 281-295. <https://doi.org/10.59953/paperasia.v41i3b.459>
- Ishmail, D. M., Memba, F., & Muriithi, J. (2023). Moderating effect of firm size on the relationship between credit risk and financial performance of microfinance banks in Kenya. *International Academic Journal of Economics and Finance*, 3(8), 323-336. https://iajournals.org/articles/iajef_v3_i8_323_336.pdf
- Jahira, J. A., Subartini, B., & Sukono, S. (2021). Analysis of Microinsurance Demands Combined with Microcredit on Rice Farming by Using Utility Function. *Operation Research*. 2, pp. 54-61. International Conference Series. <https://doi.org/10.47194/orics.v2i3.175>
- Jeon, E. H. (2015). Multiple regression. In *Advancing quantitative methods in second language research* (pp. 131-158). Routledge.
- Joocheol, J. & Eunhwan, K. (2014). An Empirical Analysis on Credit Risk Models and its Application, *Journal of Economic & Financial Studies*, 02(04), 14-27.
- Junior, O. D. P. O., & Wander, A. E. (2021). Factors for the success of agricultural cooperatives in Brazil. *Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS)*, 122(1), 27-42. <https://doi.org/10.17170/kobra-202102113202>
- Kabugu, J. M., & Wamiori, G. (2022). Effect of credit risk management practices on financial performance of deposit taking savings and credit cooperatives societies in Mombasa County. *The Strategic Journal of Business & Change Management*, 9(4), 54-67. <https://doi.org/10.61426/sjbcm.v9i4.2390>

- Kadima, A. W., Maingi, M., & Sindani, M. N. (2022). Effect of credit risk control policies on financial performance of micro finance institutions in Kenya. *The Strategic Journal of Business & Change Management*, 9 (4), 1270–1282. <https://doi.org/10.61426/sjbcm.v9i4.2492>
- Kakai, P., & Jagongo, A. O. (2024). Financial soundness indicators and operational sustainability of Deposit-Taking Savings and Credit Cooperatives (Saccos) in Kenya. *International Journal of Current Aspects in Finance, Banking and Accounting*, 6(2), 91-108. <https://doi.org/10.35942/118xmx21>
- Kallandranis, C., Anastasiou, D., & Drakos, K. (2023). Credit rationing prevalence for Eurozone firms. *Journal of Business Research*, 158, 113640. <https://doi.org/10.1016/j.jbusres.2022.113640>
- Kamau, B. M., & Genga, P. A. (2019). Determinants of performance of coffee co-operative societies in Kiambu County, Kenya. *International Journal of Economics, Commerce and Management*, 7(7), 362-384. Retrieved from <https://ijecm.co.uk/wp-content/uploads/2019/07/7724.pdf>
- Kamurar, M. S., & Mbuva, G. (2025). Microfinance services and financial performance of deposit taking saccos in Nairobi City County, Kenya. *International Academic Journal of Economics and Finance (IAJEF)*| ISSN 2518-2366, 4(4), 408-420.
- Kapkiyai, C., Kipchumba, F., & Soi, N. (2025). Effectiveness of credit restructuring strategies on loan recovery. *Journal of Innovative Research*, 3(1), 55-62. <https://doi.org/10.54536/jir.v3i1.3785>
- Kariuki, F. W. (2024). The controlling effect of firm size on the nexus between interest rate risk and value of the firm: A case of savings and credit cooperatives in Kenya. *International Academic Journal of Economics and Finance*, 4(3), 1-14. https://iajournals.org/articles/iajef_v4_i3_1_14.pdf
- Kemunto, G., Kisavi, M., & Momanyi, G. (2020). Effect of credit risk management on financial performance of deposit taking savings and credit cooperative societies in Western Kenya. *Journal of Business and Management*, 22(9), 30-35. <https://doi.org/10.9790/487X-2209013035>
- Kenya National Bureau of Statistics (2024). *National Agriculture Production Report*. Nairobi.
- Kim, J. W., & Park, C. K. (2023). Can ESG performance mitigate information asymmetry? Moderating effect of assurance services. *Applied Economics*, 55(26), 2993-3007. <https://doi.org/10.1080/00036846.2022.2107991>

- Kimetto, J. K., & Kimani, E. M. (2018). Determinants of financial performance of agricultural cooperative societies in Baringo County, Kenya. *International Journal of Management and Commerce Innovations*, 5(2), 233-249. <https://www.researchpublish.com/upload/book/Determinants%20of%20Financial%20Performance-5072.pdf>
- Kipai, E. S., Gudda, P., & George, R. (2020). Effect of membership size on financial performance of savings and credit cooperative societies in Narok County, Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 12 (4), 1, 22. <https://doi.org/10.6007/IJARAFMS/v12-i4/15746>
- Kipkosgei, S., Han, J., Sieber, S., Amany, P., Bett, J., & Su, L. (2026). Strengthening agricultural resilience in Kenya's ASALs: the effects of microcredit on climate-smart practices and sustainable tomato production. *Environment, Development and Sustainability*, 1-30. <https://doi.org/10.1007/s10668-025-07300-2>
- Kiros, Y. W. M. (2022). Determinants of loan repayment performance of micro and small enterprises: Empirical evidence from Somali Regional State, Ethiopia. *The Journal of Entrepreneurial Finance*, 24(2), 59-76. https://digitalcommons.pepperdine.edu/jef/vol24/iss2/3?utm_source=digitalcommons.pepperdine.edu%2Fjef%2Fvol24%2Fiss2%2F3&utm_medium=PDF&utm_campaign=PDFCoverPages
- Kokonya, S. R. O. (2024). *Credit risk management and loan performance of digital lending companies in Kenya* (Doctoral dissertation, Kenyatta University).
- Koulouridi, E., Kumar, S., Nario, L., Pepanides, T., & Vettori, M. (2020). Managing and monitoring credit risk after the COVID-19 pandemic. *McKinsey & Company*.
- Kurgat, D. K., Gatawa, J., & Simiyu, E. M. (2025). Board responsibility and financial performance of agricultural cooperative societies in Kericho County, Kenya. *Journal of Economics and Finance*, 16(1), 41-52. <https://doi.org/10.9790/5933-1601024152>
- Kwashie, A. A., Baidoo, S. T., & Ayesu, E. K. (2022). Investigating the impact of credit risk on financial performance of commercial banks in Ghana. *Cogent Economics & Finance*, 10(1), 2109281. <https://doi.org/10.1080/23322039.2022.2109281>
- Langyintuo, A. (2020). Smallholder farmers' access to inputs and finance in Africa. In *The role of smallholder farms in food and nutrition security* (pp. 133-152). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-42148-9_7

- Leland, H. E. and Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation, *The Journal of Finance* 32
- Liang, Q., Bai, R., Jin, Z., & Fu, L. (2023). Big and strong or small and beautiful: Effects of organization size on the performance of farmer cooperatives in China. *Agribusiness*, 39(1), 196-213. <https://doi.org/10.1002/agr.21767>
- Linarelli, J. (2021). Equality and access to credit: A social contract framework. *Law & Contemporary Problems*, 84, 165-180. Retrieved from <https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=4991&context=lcp>
- Liu, H., Wu, S., Zhong, C., & Liu, Y. (2020). The sustainable effect of operational performance on financial benefits: Evidence from Chinese quality awards winners. *Sustainability*, 12(5), 1966. <https://doi.org/10.3390/su12051966>
- Liu, L., Zhang, Z., & Lyu, K. (2021, September). A study of IPO under-pricing using regression model based on information asymmetry, media, and institution. In *2021 International Conference on Financial Management and Economic Transition (FMET 2021)* (pp. 322-333). Atlantis Press. <https://doi.org/10.2991/aebmr.k.210917.051>
- Ma, W., Rahut, D., & Sonobe, T. (2024). *Linking farmers to markets through agricultural cooperatives and E-commerce in Asia*. ADB Institute.
- Mabeta, J. (2025). Agricultural sector performance in SADC countries. *Economics Working Papers*, 9(2), 4-53. <https://doi.org/10.32725/ewp.2025.002>
- Maina, E. M., & Njeru, A. (2023). Influence of credit risk management practices on loan recovery performance of the registered digital credit providers in Kenya. *The Strategic Journal of Business & Change Management*, 10(4), 682-695. <https://doi.org/10.13140/RG.2.2.26892.28801>
- Maina, M. M., Kiai, R., & Muchiri, J. (2024). Effect of loan-loss provisioning on financial performance of deposit taking SACCOs in Kirinyaga County, Kenya. *International Journal of Research in Business and Social Science*, 13(5), 463-472. <https://doi.org/10.20525/ijrbs.v13i5.3399>
- Makori, G. M. (2023). *Credit management techniques and loan performance of commercial banks in Kenya* (Doctorate thesis, University of Nairobi).
- Mangara, S., Magali, J., & Matoka, C. (2025). The effect of moderation role of institutional factors on performance of savings and credit cooperative societies in Tanzania. *International Journal of Business, Law, and Education*, 6(1), 95-106. <https://doi.org/10.56442/ijble.v6i1.979>

- Martínez-López, I., Fernández-Barcala, M., & González-Díaz, M. (2023). Unraveling agricultural cooperatives' performance measurement: a literature review. *International Food and Agribusiness Management Review*, 27(1), 26-55. <https://doi.org/10.22434/ifamr2023.0054>
- Mawia, F. K. (2023). *Factors influencing youth participation in agricultural cooperatives in the semi-arid areas of Kenya a case study of Mwingi, Kitui County* (Doctoral dissertation, Strathmore University).
- Mbithi, M. N. (2023). *Credit lending models and loan performance of Deposit Taking Savings and Credit Cooperative Societies in Kenya* (Doctoral dissertation, University of Nairobi).
- Mburu, I. M. (2021). *Credit management practices and loan performance of commercial banks in Kenya* (Doctoral dissertation, Kenyatta University).
- McNamara, A., O'Donohoe, S., & Murro, P. (2020). Lending infrastructure and credit rationing of European SMEs. *The European Journal of Finance*, 26(7-8), 728-745. <https://doi.org/10.1080/1351847X.2019.1637357>
- Mellahi, K., & Harris, L. C. (2016). Response rates in business and management research: An overview of current practice and suggestions for future direction. *British Journal of Management*, 27(2), 426-437. <http://wrap.warwick.ac.uk/73828>
- Miglo, A. (2022). Theories of financing for entrepreneurial firms: a review. *Forthcoming in International Review of Entrepreneurship*.
- Ministry of Agriculture, Livestock, Fisheries and Cooperatives (2019). *National Cooperative Policy: Promoting Co-operatives for Socio-Economic Transformation*. Retrieved from <https://www.cak.coop/pages/downloads>
- Miroro, O. O., Anyona, D. N., Nyamongo, I., Bukachi, S. A., Chemuliti, J., Waweru, K., & Kiganane, L. (2023). Determinants of smallholder farmers' membership in co-operative societies: evidence from rural Kenya. *International Journal of Social Economics*, 50(2), 165-179. <https://doi.org/10.1108/IJSE-03-2022-0165>
- Mpirwa, S. I. (2022). *Determinants of access to agricultural credit and its effect on coffee production among smallholder coffee farmers in Gisagara District, Rwanda* (Doctoral dissertation, JKUAT-COANRE).
- Muli, E. N. (2019). Effect of Information Asymmetry on Borrowing Cost Among Micro-Finance Clients in Kenya. *International Journal of Economics, Commerce and Management*, Vol. VII, Issue 8, August 2019

- Munangi, E., & Sibindi, A. B. (2020). An empirical analysis of the impact of credit risk Assessment on the financial performance of South African banks. *Academy of Accounting and Financial Studies Journal*, 24(3), 1–15. Access: <https://www.abacademies.org/articles/an-empirical-analysis-of-the-impact-of-credit-risk-on-the-financial-performance-of-south-african-banks-9291>.
- Mwangi, E. M., Otinga, H. N., & Maina, K. E. (2021). Credit risk management practices and financial performance of saving and credit cooperative societies in Murang'a County, Kenya. *Journal of Economics and Finance*, 12(5), 1-12. <https://doi.org/10.9790/5933-1205070112>
- Mwanyika, N. T., & Koori, J. (2020). Credit accessibility and performance of small-scale farms in Taita Taveta County, Kenya. *International Academic Journal of Economics and Finance*, 3(5), 220-237. Retrieved from https://www.iajournals.org/articles/iajef_v3_i5_220_237.pdf
- Mwega, F. M. (2022). Financial regulation in Kenya: Balancing inclusive growth with financial stability. *Achieving Financial Stability and Growth in Africa*. Routledge.
- Naili, M., & Lahrichi, Y. (2022). The determinants of banks' credit risk: Review of the literature and future research agenda. *International Journal of Finance & Economics*, 27(1), 334-360. <https://doi.org/10.1002/ijfe.2156>
- Naqvi, S. K., Shahzad, F., Rehman, I. U., Qureshi, F., & Laique, U. (2021). Corporate social responsibility performance and information asymmetry: The moderating role of analyst coverage. *Corporate Social Responsibility and Environmental Management*, 28(6), 1549-1563.
- National Cooperatives Register (2017). *Registration of Cooperatives*. Retrieved from <https://www.kspc.or.ke/>
- Ndegwa, D. N. (2024). *Relationship between credit risk management practices and non-performing loans among deposit taking savings and credit societies in Nairobi County Kenya* (Doctoral dissertation, Cuk).
- Nderitu, G. N. (2022). *Effect of risk management practices on financial performance of deposit taking savings and credit cooperatives in Kenya* (Doctoral dissertation, University of Nairobi).
- Neelakanta, K., Anjum, V. A., Reddy, H. R. K., & Babu, D. R. (2025). A study on the impact of digital technologies on the microfinance sector. *International Journal of Science, Technology and Management*, 14(1), 27-36.

- Nguyen, T. T. (2021). *Discouraged borrowing, credit rationing and firm growth: A learning model in small firm* (Doctoral dissertation, University of Warwick).
- Ningsih, G. M., Rasyid, H., Ningsih, N., Pujotomo, D., & Suseno, G. P. (2025). Evaluating Risk Management Practices in Agricultural Cooperatives to Enhance Profitability and Farmer Resilience. *International Journal of Innovation and Thinking*, 2(6), 348-358. <https://doi.org/10.71364/ijit.v2i6.60>
- Nimusiima, M., Mugisha, J., Obaa, B., & Agaba, R. (2021). Performance of integrated and single cooperatives in bulk production and credit provision to smallholder farmers in Uganda. *Journal of Development and Agricultural Economics*, 13(3), 238-247. <https://doi.org/10.5897/JDAE2020.1245>
- Njeri, G. B. (2021). Influence of credit management on financial performance of dairy marketing cooperatives in Kenya. *International Journal of Accounting, Finance and Risk Management*, 6(1), 10-15. <https://doi.org/10.11648/j.ijafrm.20210601.12>
- Nji, P. M., & Engwali, F. D. (2020). Determinants of success and sustainability of farmer organizations in the North West Region of Cameroon. *Asian Journal of Agricultural Extension, Economics & Sociology*, 37(4), 1-13. <https://doi.org/10.9734/ajaees/2019/v37i430290>
- Njoki, G. J., & Mungai, J. (2025). Firm characteristics and profitability of savings and credit cooperative societies in Laikipia County, Kenya. *Asian Journal of Economics, Finance and Management*, 8(1), 139-153. <https://doi.org/10.56557/ajefm/2026/v8i1360>
- Njora, G. W., & Ndegwa, P. (2020). Motivation and employee retention in savings and credit co-operative societies in Nairobi City County, Kenya. *International Journal of Business Management, Entrepreneurship and Innovation*, 2(3), 87-101. <https://doi.org/10.35942/jbmed.v2i3.137>
- Njuguna, F. W. (2019). *Effect of interest rate capping on the financial performance of Saccos in Kenya: Case study of saccos operating FOSA in Kenya* (Doctoral dissertation, UoN).
- Nkwasiwe, N., & Katsigaire, E. A. (2023). Credit risk identification and financial performance of Saccos. A case of selected saccos in Ibanda Municipality. *American Research Journal of Humanities & Social Science*, 6(3), 13-20.
- Nomonde, J., & Mzuyande, C. (2025). Transforming South African agriculture: The role of credit in supporting value chain sustainability. *Agriculture*, 15(6), 620. <https://doi.org/10.3390/agriculture15060620>

- Nyangeri, S. O., Yugi, C. T., & Ngala, C. (2025). The moderating effect of firm size on the relationship between current assets management and financial performance of licensed microfinance institutions in Kenya. *African Journal of Empirical Research*, 6(2), 456-464. <https://doi.org/10.51867/ajernet.6.2.38>
- Nyebare, A., Obalade, A. A., & Muzindutsi, P. F. (2024). The effectiveness of credit risk mitigation strategies adopted by Ghanaian commercial banks in agricultural finance. *Journal of Risk & Financial Management*, 17(9), 1-14. <https://doi.org/10.3390/jrfm17090385>
- Obae, G., & Jagongo, A. (2022). Credit management practices and loan performance of commercial banks in Kenya. *International Academic Journal of Economics and Finance*, 3(7), 222-237. https://iajournals.org/articles/iajef_v3_i7_222_237.pdf
- Obande, F. C. B., Kung'u, J., & Gichohi, M. A. (2017). The moderating effect of dairy co-operative characteristics on capital structure and financial performance of dairy co-operative societies in Nakuru North Sub County, Kenya. *International Journal of Economics, Commerce and Management*, 5(9), 370-387.
- Obondy, S., Aduda, J., Okiro, K., & Mutunga, O. (2025). Credit risk management, efficiency and financial performance: Evidence from Deposit-Taking Savings and Credit Cooperative Societies in Kenya. *Research Beacon*, 19(6), 65-85. <https://doi.org/10.9790/5933-1604030106>
- Ochieng, K. O. (2021). *Effect of financial risk management practices on financial performance of deposit taking savings and credit cooperatives in Nairobi County, Kenya* (Doctoral dissertation, University of Nairobi).
- Ochingo, M. A., & Muturi, W. M. (2018). Effect of firm characteristics on financial performance of savings and credit cooperatives society in Kenya. *The Strategic Journal of Business & Change Management*, 5(1), 769-784. <https://doi.org/10.61426/sjbcm.v5i1.651>
- Ogundele, O. S., & Nzama, L. (2025). Risk management practices and financial performance: Analysing credit and liquidity risk management and disclosures by Nigerian banks. *Journal of Risk and Financial Management*, 18(4), 198. <https://doi.org/10.3390/jrfm18040198>
- Okero, E. O., & Waweru, F. W. (2023). Credit risk assessment and loan repayment among development financial institutions: A case of Kenya Industrial Estates Limited. *International Journal of Finance and Accounting*, 2(1), 21-29. <https://doi.org/10.37284/ijfa.2.1.1197>

- Olajide, O. A. (2024). Aligning cooperative support services: A case study of cooperative thrift and credit societies in Nigeria. *Nigerian Agricultural Policy Research Journal (NAPReJ)*, 11(1), 56-70.
- Olorunsola, G. I. O., Bunmi-Alo, A., & Dele-Oladejo, O. O. (2023). Credit risk management and efficiency of savings and credit cooperative society in Lagos State. *International Journal of Research and Innovation in Social Science*, 7(3), 505-515. <https://www.rsisinternational.org/journals/ijriss/>
- Omeje, E. E., Okpukpara, B., Ejiofor, O., & Ukwuaba, I. (2022). Determinants and preferences of credit risk management in farming: Evidence from rice enterprise in Nigeria. *Agricultural Science Digest-A Research Journal*, 42(5), 574-579. <https://doi.org/10.18805/ag.DF-447>
- Onah, O. G., Enete, A. A., Okoye, C. U., Ume, C. O., & Onyia, C. C. (2024). Impact of credit access of farmers in cooperative societies on financial performance: the predictive effect of financial literacy. *International Journal of Social Economics*, 51(11), 1420-1433. <https://doi.org/10.1108/IJSE-10-2023-0837>
- Onyango, V. A., Owuor, G., Rao, E. J., & Otieno, D. J. (2023). Impact of cooperatives on smallholder dairy farmers' income in Kenya. *Cogent Food & Agriculture*, 9(2). <https://doi.org/10.1080/23311932.2023.2291225>
- Owusu-Boafo, R., Obeng, E., & Addo, J. Y. (2020). the relationship between credit risk management and the profitability of banks in Ghana. *Economic Studies & Analyses/Acta VSFS*, 14(2). <https://doi.org/10.37355/acta-2020/2-01>
- Oyogo, S. P., Kadima, M. J., & Miroga, J. (2022). Finance data management practices on loan performance of SACCOs in Busia. Central Business District, County government of Busia; Kenya. *The Strategic Journal of Business & Change Management*, 9(1), 99–108.
- Pauly, M. V. (1983). The economics of moral hazard: Comment. *The American Economic Review*, 58(3), 531–537.
- Pasa, R. B., Regmi, B., & Adhikari, D. (2024). Members' perceived performance of an agriculture cooperative in Nepal: A case of the Devasthan Agriculture Cooperative Limited in Pokhara, Nepal. *Dhaulagiri Journal of Sociology and Anthropology*, 18(2), 1-12. <https://doi.org/10.3126/dsaj.v18i2.73284>
- Paudel, G. P. (2022). Credit risk management in Nepalese cooperative societies. *Kathmandu: Thuprai Solutions Pvt. Ltd.* <https://doi.org/10.2139/ssrn.4042518>

- Pernkopf, K., Latzke, M., & Mayrhofer, W. (2021). Effects of mixed signals on employer attractiveness: A mixed-method study based on signalling and convention theory. *Human Resource Management Journal*, 31(2), 392-413. <https://doi.org/10.1111/1748-8583.12313>
- Pokharel, K. P., Archer, D. W., & Featherstone, A. M. (2020). The impact of size and specialization on the financial performance of agricultural cooperatives. *Journal of Co-operative Organization and Management*, 8(2), 100108. <https://doi.org/10.1016/j.jcom.2020.100108>
- Pokharel, K. P., Regmi, M., Featherstone, A. M., & Archer, D. W. (2019). Examining the financial performance of agricultural cooperatives in the USA. *Agricultural Finance Review*, 79(2), 271-282. <https://doi.org/10.1108/AFR-11-2017-0103>
- Prastiwi, I. E., & Anik, A. (2020). The impact of credit diversification on credit risk and performance of Indonesian banks. *Global Review of Islamic Economics and Business*, 8(1), 013-021. <https://doi.org/10.14421/grieb.2020.081-02>
- Qian, X., & Olsen, T. L. (2021). Financial and risk management in agricultural cooperatives with application to the milk industry in New Zealand. *International Journal of Production Research*, 59(19), 5913-5943. <https://doi.org/10.1080/00207543.2020.1797204>
- Reed, D. (2023). Access to markets. *Encyclopaedia of the Social and Solidarity Economy*, 338. <https://doi.org/10.4337/9781803920924.00058>
- Ruggerio, C. A. (2021). Sustainability and sustainable development: A review of principles and definitions. *Science of the total environment*, 786, 147481. <https://doi.org/10.1016/j.scitotenv.2021.147481>
- Saad, B. H., El-Ansary, D., & Sherif, S. (2023). An assessment of performance effectiveness of agricultural cooperatives in Egypt: Case study of Nubariya District. *Alexandria Science Exchange Journal*, 44(3), 473-487. <https://doi.org/10.21608/asejaiqjsae.2023.317324>
- Sacchetti, S., & Tortia, E. C. (2021). Governing cooperatives in the context of individual motives. *International Journal of Social Economics*, 48(2), 181-203. <https://doi.org/10.1108/IJSE-09-2019-0579>
- Sang, A., Peter, C. K., & Rop, W. (2025). Moderating effect of firm size on the relationship between board composition and financial performance of regulated SACCOs in South Rift Region, Kenya. *International Journal of Recent Research in Commerce Economics and Management*, 11(3), 11-17.

- Sapingi, R., Nelson, S. P., & Sheikh, O. S. N. (2023). Assessing the extent of disclosure and information asymmetry in Malaysian zakat institutions. *International Journal of Economics & Management*, 17(1), 1-18. <http://doi.org/10.47836/ijeam.17.1.01>
- Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: appropriate use and interpretation. *Anesthesia & analgesia*, 126(5), 1763-1768. <https://doi.org/10.1213/ANE.0000000000002864>
- Scott, A. O., Amajuoyi, P., & Adeusi, K. B. (2024). Effective credit risk mitigation strategies: Solutions for reducing exposure in financial institutions. *Magna Scientia Advanced Research and Reviews*, 11(1), 198-211. <https://doi.org/10.30574/msarr.2024.11.1.0084>
- Sebhatu, K. T., Gezahegn, T. W., Berhanu, T., Maertens, M., Van Passel, S., & D'Haese, M. (2021). Exploring variability across cooperatives: economic performance of agricultural cooperatives in northern Ethiopia. *International Food and Agribusiness Management Review*, 24(3), 397-420. <https://doi.org/10.22434/IFAMR2019.0215>
- Sharpe, S. (2018). Asymmetric information, bank lending, and implicit contracts: A theoretical model of customer relationship, *Journal of Finance*, 1069-1087.
- Shibutse, R., Kalunda, E., & Achoki, G. (2019). Effect of leverage and firm size on financial performance of deposit taking savings and credit cooperatives in Kenya. *International Journal of Research in Business and Social Science*, 8(5), 182-193. <https://doi.org/10.20525/ijrbs.v8i5.462>
- Shurie, F. B. O. (2022). *Restructuring Strategies and Performance of Small and Medium Commercial Banks in Nairobi City County, Kenya* (Doctoral dissertation, Kenyatta University).
- Sikira, R., Madaba, R., & Filbert, R. (2024). Navigating loan recovery process from SMEs: Identifying critical challenges for microfinance institutions in Tanzania. *International Journal of Scientific Research and Management*, 12(4), 6097-6111. <https://doi.org/10.18535/ijssrm/v12i04.em05>
- Sinnaiah, T., Adam, S., & Mahadi, B. (2023). A strategic management process: the role of decision-making style and organisational performance. *Journal of Work-Applied Management*, 15(1), 37-50. <https://doi.org/10.1108/JWAM-10-2022-0074>
- Solanki, K., Soni, H., & Sharma, S. (2023). Credit risk management in Indian commercial banks. *International Research Journal of Modernization in Engineering Technology and Science*, 5(2), 1529-1534. <https://www.doi.org/10.56726/IRJMETS33754>

- Spence, M. (2014). Job market signalling. *The Quarterly Journal of Economics*, 87(3), 355-374. <https://doi.org/10.2307/1882010>
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American economic review*, 71(3), 393-410.
- Sudi, P., & Musiega, M. (2020). Effect of credit risk management practices on financial performance of micro-finance institutions in Nairobi. *International Journal of Recent Research in Social Sciences and Humanities*, 7(3), 22-39.
- Tiriongo, S. K., Kanyumbu, D. K., & Maana, I. (2021). Risk-based credit pricing in Kenya: The role of banks' internal factors. *Kenya Bankers Association Centre for Research on Financial Markets and Policy Working Paper: Access*; <https://ideas.repec.org/p/zbw/kbawps/64.html>
- Tran, C. S., Nicolau, D., Nayak, R., & Verhoeven, P. (2021). Modeling credit risk: A category theory perspective. *Journal of Risk and Financial Management*, 14(7), 298. <https://doi.org/10.3390/jrfm14070298>
- Umeorah, S. C., Adelaja, A. O., Abikoye, B. E., Ayodele, O. F., & Ogunsuji, Y. M. (2024). Data-driven credit risk monitoring: Leveraging machine learning in risk management. *Finance & Accounting Research Journal*, 6(8), 1416-1435. <https://doi.org/10.51594/farj.v6i8.1399>
- Uwaramutse, C., Towo, E. N., & Machimu, G. M. (2022). Influence of co-operative characteristics on financial performance of Irish potato farmer co-operatives in northern and western province Rwanda. *African Journal of Applied Research*, 8(2), 220-239. <https://doi.org/10.26437/ajar.31.10.2022.15>
- Vosooghidizaji, M., Taghipour, A., & Canel-Depitre, B. (2020). Supply chain coordination under information asymmetry: a review. *International Journal of Production Research*, 58(6), 1805-1834. <https://doi.org/10.1080/00207543.2019.1685702>
- Wambua, V. M., Waweru, K., & Wambu, C. K. (2024). Moderating effect of legislation on relationship between membership diversity and financial performance of agricultural cooperatives in Kenya. *East Africa Journal of Science and Technology*, 14(2), 1-14. <https://doi.org/10.62103/unilak.eajst.14.2.025>
- Wang's, H. (2020) A Study of Risk-Based Pricing in Peer-to-Peer Lending, *Journal of Finance*, 59(2), 831-868.
- Wanjiru, N. A., & Muturi, W. (2020). Factors affecting financial performance of savings and credit co-operative societies: case study Kiambu County. *International Journal of Management and Commerce Innovations*, 3(2), 196-207. Retrieved from

<https://www.researchpublish.com/papers/factors-affecting-financial-performance-of-savings-and-credit-co-operative-societies-case-study-kiambu-county>

- Willis, J. Upadhyaya, R., & Njuguna, E. (2024). *For their mutual benefit Kenya's SACCOs: history and prospects - A report from a pilot research project*. Nairobi: FSD Kenya.
- Yanenkova, I., Nehoda, Y., Drobyazko, S., Zavorodnii, A., & Berezovska, L. (2021). Modeling of bank credit risk management using the cost risk model. *Journal of Risk and Financial Management*, 14(5), 211.
- Yobe, C. L., Ferrer, S., & Mudhara, M. (2024). Determinants of market choice among agricultural cooperatives in South Africa. *Journal of Agribusiness and Rural Development*, 71(1), 103-123. <https://doi.org/10.17306/J.JARD.2024.01810>
- Žukauskas, P., Vveinhardt, J., & Andriukaitienė, R. (2018). Philosophy and paradigm of Scientific Research. *Management Culture and Corporate Social Responsibility*, 121-139. <https://doi.org/10.5772/intechopen.70628>

APPENDICES

APPENDIX I: QUESTIONNAIRE

Dear Respondent,

I am Ibrahim Mulabi Shiveka, a student of **Strathmore University Business School** pursuing a Master of Commerce Degree. I am carrying research on “ *credit risk management processes and the operational performance of agricultural cooperatives in Nairobi metropolitan area: moderated by Firm size*”. Your opinions will be highly appreciated and any information that you provide will be treated with the utmost confidentiality, since it is strictly for academic purposes.

Thanks for your cooperation,

.....

Ibrahim Mulabi Shiveka

SECTION A: Background Information of the Respondents

Instructions: Tick the correct option

1. What is your job title?

- ☐ Loan Officer
- ☐ Credit Risk Manager
- ☐ Branch Manager
- ☐ Other (please specify) _____

2. How long have you been working in the banking sector?

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 4-6 years
- ☐ More than 6 years

3. How long have you been involved in agricultural financing?

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 4-6 years
- ☐ More than 6 years

SECTION B: CREDIT RISK ASSESSMENT

Indicate the extent to which you agree with the following statement based on a rate scale of 1-5 credit risk assessment. (Key; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree).

S/NO	STATEMENT	1	2	3	4	5
1	This cooperative strictly uses credit scores to assess the creditworthiness of farmers and agribusinesses					
2	Farmers with higher credit scores often receive loans at lower interest rates					
3	Borrowers with poor or no credit history may face challenges in accessing financing.					
4	A strong credit history allows farmers to secure higher loan amounts with longer repayment periods.					
5	Consistent repayment behaviour builds trust with financial institutions, leading to long-term financial support.					
6	The organisation uses payment behaviour data to categorize borrowers into risk tiers and adjust lending strategies accordingly.					

SECTION C: CREDIT RISK MONITORING

Indicate the extent to which you agree with the following statement based on a rate scale of 1-5 concerning credit policies. (Key; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree).

S/NO	STATEMENT	1	2	3	4	5
1	The cooperative has incorporated the right computer credit risk monitoring solutions to ensure more effective and efficient credit risk monitoring.					
2	Digitised credit risk monitoring aids had eased the process through which the organisation has been able to evaluate the collateral against the credit applied for, which consequently led to improved loan recovery performance.					
3	Effective credit management ensured timely debt recovery which translated into improved return on investment for the cooperative.					
4	The cooperative has experienced challenges in its loan recovery strategies owing to the informal nature of some of the businesses invested by loan recipients and making it more difficult for them to boost their revenues and repay the loans.					
5	The cooperative opted for the provision of lower than market interest rates for borrowers in order to entice them to resume servicing their loans.					
6	A more popular debt restructuring approach applied by the cooperative was the use of an extended repayment period.					

SECTION D: CREDIT RISK IDENTIFICATION

Indicate the extent to which you agree with the following statement based on a rate scale of 1-5 concerning risk-based pricing. (Key; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree).

S/NO	STATEMENT	1	2	3	4	5
1	The lack of effective credit risk identification mechanisms has weakened the credit management efforts of the cooperative since it has been unable to prevent the occurrence of adverse selection where some high-risk farmers were able to received loans.					
2	The firm has employed credit risk identification mechanisms that were too strict to the point of discouraging loyal members from borrowing and resulting in poor profitability.					
3	The most common credit risk identification technique employed by the cooperative is the use of credit referencing with the Credit Referencing Bureau.					
4	AI-based techniques such as scenario analysis were advantageous in credit risk prediction.					
5	A key credit risk identification approach that was employed by the firm was the adoption of expert judgement on the basis of improved training of credit officers.					
6	The lack of investment in best credit risk identification processes has adversely affected the effectiveness of the cooperative.					

SECTION E: CREDIT RISK CONTROL

Indicate the extent to which you agree with the following statement based on a rate scale of 1-5 concerning loan recovery practice. (Key; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree).

S/NO	STATEMENT	1	2	3	4	5
1	Through the use of analytical and statistical models, the cooperative has been able to ensure efficient credit data management which has enhanced its loan performance.					
2	The lack of awareness of effective credit data management techniques had hampered the adoption of these techniques by the firm.					
3	Loan securitisation through loan insurance policy has led to improved financial performance of the cooperative.					
4	The most critical aspect of loan insurance policies that have been adopted by the cooperative is loan loss provisioning.					
5	Owing to the prevalence of credit rationing, the cooperative only received a small portion of the loans that it had applied for.					
6	Credit information sharing has increasingly become a more effective credit risk control mechanism employed by financial institutions rather than credit rationing.					

SECTION F: FIRM SIZE

Indicate the extent to which you agree with the following statement based on a rate scale of 1-5 concerning agricultural financing. (Key; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree).

S/NO	STATEMENT	1	2	3	4	5
1	There was no significant relationship between the size of the membership and the performance of the cooperative.					
2	Larger cooperatives were able to recruit more qualified members into their boards of directors.					
3	Firm size, as measured by the number of employees, had a positive and significant moderating effect on the relationship between credit risk and financial performance of the cooperative.					
4	Whilst there was a positive and significant relationship between board responsibility and financial performance, the moderating effect of firm size on this relationship was an insignificant one.					
5	The organisation is well endowed with high value assets, which has enabled it to procure loans for development and growth.					
6	Asset valuation was an insignificant moderator of the relationship between capital structure and financial performance.					

SECTION G: PERFORMANCE

Indicate the extent to which you agree with the following statement based on a rate scale of 1-5 concerning agricultural financing. (Key; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree).

S/NO	STATEMENT	1	2	3	4	5
1	Farmers with superior access to credit experienced enhanced financial performance relative to those that had poorer access to credit.					
2	Timely availability of credit was associated with improved financial performance of farmers given that it enabled the purchase of required inputs and farm machinery that were essential for production.					
3	The agricultural cooperative has ensured the provision of collective bargaining power to assist farmers in achieving higher sales volumes.					
4	The cooperative has been able to improve the proximity of farmers to markets through the establishment of policies that enhanced cooperative market participation.					
5	Through the adoption of a community-oriented approach and unique organisational structures the cooperative has been able to promote the sustainability of smallholder farmers in rural areas.					
6	The cooperative has been able to ensure the sustainability of smallholder farmers through the provision of training in sustainable agricultural practices.					

Thank you for taking the time to answer this questionnaire.

Thank you for your time and Cooperation

APPENDIX II: BUDGET

Items/Activities	KSHS
Secretarial Services:	
Typing the proposal	2,500.00
Typing the final report	10,000.00
Photocopying the questionnaires	3,500.00
Stationery	
Writing materials	8,500.00
Duplicating papers	8,500.00
Pens and pencils	300.00
Traveling	
To pre-test questionnaires	1,000.00
To administer questionnaires	1,000.00
Binding expenses	
Binding the proposal	2,000.00
Binding the final report	7,500.00
Computer expenses	5,000.00
Data Analysis Consultancy	10,000
Total	62,000.00

Source: Author (2025)

APPENDIX III: WORK PLAN 2025-2026

Activity	January	February	March	April	May
Course/project Registration					
Supervisor allocation and Topic Formulation					
Proposal Development					
Proposal Approval & Defense					
Corrections after defense Permit Issuance					
Data Collection					
Data Analysis					
Defense					
Corrections & Final Submission					

Source: Author (2025)

APPENDIX IV: Distribution of Target Population

Table 3. 3: Distribution of Target Population

Agricultural Cooperative	Location
1 Chai Sacco Society	Nairobi
2 Kencream Sacco Ltd.	Nairobi
3 Fundilima Sacco	Kiambu
4 Kwetu Sacco	Machakos
5 NRS Sacco	Kiambu
6 Ndumberi National Dairy Farmer's Cooperative	Kiambu
7 Limuru Dairy Farmer's Cooperative	Kiambu
8 Githunguri Dairy farmer's Cooperative	Kiambu
9 Muguga Dairy Farmer's Cooperative	Kiambu
10 Kabete Dairy Farmer's Cooperative	Kiambu
11 Kiambaa Dairy Farmer's Cooperative	Kiambu
12 Kirita Dairy Farmer's Cooperative	Kiambu
13 Kikuyu Dairy Farmer's Cooperative	Kiambu
14 Kigoro Dairy Farmer's Cooperative	Murang'a
15 Kirima Slopes Dairy Farmer's Cooperative	Murang'a
16 Tulaga Farmer's Cooperative	Murang'a
17 Machakos Cooperative Union	Machakos
18 Kajiado North Meat Farmer's Cooperative	Kajiado
19 Kajiado Women Dairy Cooperative	Kajiado
20 Kajiwest Meat Marketing Cooperative	Kajiado
21 Kiambu Coffee Growers Cooperative Union Ltd	Kiambu
22 Gitutu Farmer's Cooperative	Kiambu
23 Ndumberi Coffee Farmers' Cooperative Society	Kiambu
24 Kiambu Poultry Farmers' Cooperative Union Ltd.	Kiambu
25 Gikambura Dairy Farmers' Cooperative Society	Kiambu
26 Sigona Dairy Farmers' Cooperative Society	Kiambu
27 Rware Dairy Farmers' Cooperative Society	Kiambu
28 Mangu Progressive Cooperative Society	Kiambu
29 Gatamaiyu Dairy Farmers' Cooperative Society	Kiambu
30 Murang'a Avocado Farmers' Cooperative Union Ltd.	Murang'a
31 Murang'a Farmers' Cooperative Union	Murang'a
32 Iyego Farmers' Cooperative Society	Murang'a
33 Gatagua Agro-marketing Farmers' Cooperative Society	Murang'a
34 Murang'a County Creameries Cooperative Union	Murang'a
35 Kambusu Farmers' Cooperative Society	Machakos
36 Lower Eastern Dairy Cooperative Society	Machakos
37 Mukuyuni Farmers' Cooperative Society	Machakos
38 Kasinga Farmers' Cooperative Society	Machakos
39 Maasai Kajiado Women Dairy Cooperative Society	Kajiado

Source: County Government publications for Nairobi, Machakos, Kiambu, Kajiado and Muranga Counties (2025)

APPENDIX V: Summary of Literature Review Map

Author/Region	Focus of the study	Theories	Methodology	Findings	Research gap: Evidence from the Literature	Focus of this Study
Brahmaiah (2022)	Credit risk assessment practices of Indian banking industry: An empirical study	Moral Hazard Theory & Duffie-Singleton Model	Employed a quantitative research design	Private sector banks demonstrated better credit risk management practices compared to public sector banks, with PSBs exhibiting higher non-performing assets (NPAs) and lower profitability ratios during the study period.	There is a contextual gap since the study focused on India's banking industry, where credit risk assessment is shaped by a highly diversified economy, strong banking regulations, and industrial financing priorities compared to Kenya where agricultural risks include weather variability, market price fluctuations, and smallholder farming challenges.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size

Munangi and Sibindi (2020)	Empirical analysis of the impact of credit risk Assessment on the financial performance of South African banks.	Adverse Selection Theory and Moral Hazard Theory	The study utilized an explanatory research design	The study found a significant negative relationship between credit risk, measured by the non-performing loans ratio, and bank financial performance, proxied by return on assets (ROA).	There was a methodological gap since the study employed panel data analysis over a decade (2008-2018) to assess the impact of credit risk on financial performance while current study utilizes cross-sectional data or shorter time frames, which may not capture long-term trends.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size.
Kadima, Maingi and Sindani (2022)	Effect of credit risk control on financial performance of microfinance institutions in Kenya	Credit Spread Puzzle Model and Credit Risk Theory.	The study adopted a descriptive survey research design & Census technique	effective credit risk control practices, such as rigorous client assessment and continuous monitoring, positively influence the financial performance of microfinance institutions	However, there is an empirical gap since their study investigated credit risk control practices within Kenyan MFIs, emphasizing their impact on financial performance	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size

Kiprono and Njeru (2022)	the influence of credit risk monitoring on the growth of shareholders' wealth in deposit-taking Saccos in Nairobi City County bank	The study was supported by the Credit Risk Theory.	A descriptive research design was selected and 42 licensed DT-SACCOs were included in the target population. Primary data was collected from a sample of 118 employees from these SACCOs using structured questionnaires.	The results indicated that credit risk monitoring was positively and significantly associated with the growth of shareholders' wealth. This notwithstanding, some of the SACCOs had not incorporated the right computer credit risk monitoring solutions to ensure more effective and efficient credit risk monitoring.	The study had a number of knowledge gaps including: the focus on DT-SACCOs in general rather than agricultural cooperatives in particular which represents a contextual gap; and the lack of a theoretical framework, which signifies a theoretical gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
--------------------------	--	--	---	---	--	---

Gitau (2021)	studied the influence of credit management on financial performance of dairy marketing cooperatives in Kenya.	The study was underpinned by the Financial Stewardship Theory.	It applied a descriptive panel research design and the target population was four dairy marketing cooperatives in Kisii, Nyamira, Bomet and Kericho counties. Secondary data was collected from the four cooperatives using financial statements for period spanning 2009 to 2018.	According to the results of the study, effective credit management ensured timely debt recovery which translated into improved return on investment for the cooperatives.	The study had the following knowledge gaps: the choice of theoretical framework which represents a theoretical gap; whereas the concentration on four specific cooperatives rather than a more generalised assessment represents a contextual gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
--------------	---	--	--	---	--	---

Olajide (2024)	The alignment of cooperative support services by cooperative thrift and credit societies in Nigeria.	The study was supported by the Social Capital Theory.	A mixed methods research design was selected and primary data was collected from 20 respondents in 4 cooperatives in Ibadan, Nigeria using structured questionnaires. The data was analysed using multinomial logistic regression.	The results indicated that a number of cooperatives experienced challenges in their loan recovery strategies owing to the informal nature of some of the businesses invested by loan recipients and making it more difficult for them to boost their revenues and repay the loans.	The study's geographical setting in Nigeria represents a contextual gap; whereas the different theoretical framework signifies a theoretical gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
Mwanyika and Koori (2020)	The influence of credit accessibility on the performance of small-scale farms in Taita Taveta County, Kenya.	The study was supported by the Information Asymmetry	A descriptive review research design was selected and primary data collected from	The results showed that the lack of effective credit risk identification mechanisms	The study was limited by: the focus on small-scale farmers rather than on agricultural cooperatives which represents a contextual gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm

y, Adverse Selection, Capital Structure, and Pecking Order theories.	a sample of 111 farmers using self- administered questionnaires. Descriptive and inferential data analysis was then conducted with the aid of SPSS.	have weakened the credit management efforts of farmer cooperatives since they were unable to prevent the occurrence of adverse selection where some high-risk farmers were able to receive loans.	size
--	--	---	------

Mwangi et al. (2021)	The correlation between credit risk management practices and financial performance of SACCOs in Murang'a County, Kenya.	The study was underpinned by the agency theory, adverse selection theory and modern portfolio theory.	It opted for a descriptive research design and collected primary data from 93 respondents working in 31 SACCOs using questionnaires. Descriptive and inferential statistical data analysis were conducted on the data.	The results showed that some of the SACCOs had employed credit risk identification mechanisms that were too strict to the point of discouraging loyal members from borrowing and resulting in poor profitability.	The study's main knowledge gaps included: the focus on SACCOs in general rather than on agricultural cooperatives which represents a contextual gap; and differences in the theoretical framework which represents a theoretical gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
----------------------	---	---	--	---	---	---

Kabugu and Wamiori (2022)	The effect of credit risk management practices on financial performance of deposit-taking SACCOs in Mombasa County, Kenya.	The study was supported by the Credit Risk, Principal-Agent, Asymmetric Information and Credit Management theories.	A descriptive survey research design was adopted and primary data collected from 48 respondents using questionnaires while secondary data was collected	According to the results, the most common credit risk identification technique employed by SACCOs was the use of credit referencing with the Credit Referencing Bureau (CRB). The study recommended that more technical tools for credit risk identification be employed such as credit scenario analysis.	The study had a number of research gaps including: the use of secondary data which represents a methodological gap; and the focus on all DT-SACCOs rather than on agricultural cooperatives represents a contextual gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
---------------------------	--	---	---	--	--	---

Oyogo et al. (2022)	Conducted a study on finance data management practices on loan performance of SACCOs in Busia, Kenya.	The study was underpinned by the Modern Portfolio and Agency theories.	A descriptive survey research design was selected and primary data collected from 80 staff of registered DT-SACCOs operational in Busia using structured questionnaires. SPSS enabled the descriptive and inferential statistical analysis of the data.	The findings indicated that there was a positive and significant relationship between strong finance data management and loan performance. More specifically, through the use of analytical and statistical models, some of the SACCOs have been able to ensure efficient credit data management which has enhanced their loan performance.	The study had a number of research gaps including: the focus on SACCOs in general rather than on agricultural cooperatives which represents a contextual gap; and the different theoretical framework which represents a theoretical gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
---------------------	---	--	---	---	---	---

Angweye and Otinga (2020)	Examined the influence of loan insurance policy on financial performance of SACCOs in Kakamega County, Kenya.	The study was supported by the Balanced Portfolio Theory.	It opted for a descriptive survey research design. Primary data was collected from a sample of 105 senior managers working in 13 SACCOs in Kakamega County, Kenya using structured questionnaires. The data was analysed with the aid of SPSS.	The results indicated that loan securitisation through loan insurance policy was positively associated with improved financial performance of the SACCOs.	The study's knowledge gaps included: the focus on DT-SACCOs in general rather than agricultural cooperatives which represents a contextual gap; the use of the Balanced Portfolio Theory which represents a theoretical gap; and the specific concentration on loan insurance policy rather than on credit risk management which represents a conceptual gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
Gurmesssa et al. (2021)	On partial credit guarantee and financial additionality for smallholder coffee cooperatives in Ethiopia.	The study was anchored on the Credit Risk Theory.	It adopted a mixed methods research design and 80 coffee cooperatives included in the target population. Primary data	The findings indicated that owing to the prevalence of credit rationing, the cooperatives only received a small portion of the loans that they had	The study's geographical setting of Ethiopia represents a contextual gap; whereas its choice of a mixed methods research design represents a methodological gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size

			was collected using key informant interviews and focus group discussions from representatives from these cooperatives.	applied for due to institutional limitations and low business capacities.		
Kipai et al. (2020)	Studied the effect of membership size on financial performance of SACCOs in Narok County, Kenya.	The study was anchored on Organisational Theory.	It selected a cross-sectional survey research design. Secondary data was collected from 17 active SACCOs in the County using financial statements. The data was analysed using linear regression technique.	The findings showed that there was no significant relationship between membership and the financial performance of the SACCOs. Nonetheless, the study recommended that the organisations endeavour to build their membership so	The study had a number of research gaps including: the general focus on SACCOs rather than agricultural cooperatives which signifies a contextual gap; the use of a cross-sectional survey research design which represents a methodological gap; and the choice of Organisational Theory which represents a theoretical gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size

				as to become more competitive in terms of increasing their savings.		
Wanjiru and Muturi (2020)	Investigated the determinants of financial performance of SACCOs in Kiambu County, Kenya.	The study was supported by the Theory of Credit Default, and the Theory of Micro-Loan Borrowing Rates and Default.	It chose a descriptive research design and targeted all 12 registered SACCOs in the County. Secondary data was collected from the 12 SACCOs for the period between 2010 and 2014. SPSS facilitated the conduct of descriptive and inferential statistical analysis.	According to the results, the size of the membership had a weak correlation with the financial performance of the SACCOs when compared with default rate and dividend policy.	The choice of theoretical framework represents a theoretical gap; whereas the lack of focus on credit risk management represents a conceptual gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size

Ishmail et al. (2023)	Examined the moderating effect of firm size on the relationship between credit risk and financial performance of microfinance banks in Kenya.	The study was anchored by the Agency Theory.	It applied both explanatory and quantitative research designs. It targeted 13 registered microfinance banks as at December 2019 and collected secondary data from the financial statements of these banks for the period spanning 2011 and 2019. The data was subjected to panel data regression analysis.	The findings indicated that firm size, as measured by the number employees, had a positive and significant moderating effect on the relationship between credit risk and financial performance of the microfinance banks.	The study's main research gaps included: the focus on microfinance banks rather than agricultural cooperatives which represents a contextual gap; the different theoretical framework which signifies a theoretical gap; and the different research design which represents a methodological gap.	The present study seeks to examine the effect of credit risk management processes and the performance of agricultural cooperatives in Nairobi Metropolitan area; moderated by firm size
-----------------------	---	--	--	---	---	---

APPENDIX VI: NACOSTI RESEARCH PERMIT

 REPUBLIC OF KENYA Ref No: 579404	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION Date of Issue: 20/November/2025
RESEARCH LICENSE	
	
This is to Certify that Mr.. Ibrahim Mulabi Shiveka of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kajiao, Kiambu, Machakos, Muranga, Nairobi on the topic: THE EFFECT OF CREDIT RISK MANAGEMENT PRACTICES AND THE PERFORMANCE OF AGRICULTURAL COOPERATIVES IN KENYA: MODERATED BY FIRM SIZE for the period ending : 20/November/2026.	
License No: NACOSTI/P/25/4182267	
579404 Applicant Identification Number	 Ag. Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Verification QR Code 	
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	
See overleaf for conditions	

APPENDIX VII: ETHICAL CLEARANCE



6th November 2025

Mr Shiveka Ibrahim,
ibrahim.shiveka@strathmore.edu

Dear Mr Shiveka,

RE: The Effect of Credit Risk Management Practices and the Performance of Agricultural Cooperatives in Kenya: Moderated by Firm Size

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC3124/25**. The approval period is from **6th November 2025 to 5th November 2026**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, and MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification
- iv. Any changes, anticipated or otherwise, that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours
- v. Clearance for the export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and obtain other clearances needed.

Yours sincerely,

**Mr Ambrose Rachier,
Chairperson; SU-ISERC**

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

17% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Filtered from the Report

- Bibliography
- Quoted Text
- Cited Text

Exclusions

- 5 Excluded Sources

Match Groups

-  **513 Not Cited or Quoted 17%**
Matches with neither in-text citation nor quotation marks
-  **0 Missing Quotations 0%**
Matches that are still very similar to source material
-  **0 Missing Citation 0%**
Matches that have quotation marks, but no in-text citation
-  **0 Cited and Quoted 0%**
Matches with in-text citation present, but no quotation marks

Top Sources

- 13%  Internet sources
- 9%  Publications
- 11%  Submitted works (Student Papers)