THE EFFECT OF CREDIT RISK MANAGEMENT ON THE FINANCIAL PERFORMANCE OF DEPOSIT TAKING MICROFINANCE INSTITUTIONS IN KENYA

GEORGE OMONDI MUNYASIA

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES, UNIVERSITY OF NAIROBI.

NOVEMBER, 2023

DECLARATION

I hereby declare that this research project is my original work and has not been submitted for a degree or examination in any other University.

Signature _____ Date 10/11/23

GEORGE OMONDI MUNYASIA

Reg No: D61/38448/2020

This research project has been submitted for examination with my approval as the University Supervisor

Signature _____ Date 22/11/2023

Dr. Ronald Chogii

University of Nairobi.

ACKNOWLEDGEMENT

My sincere gratitude goes to Almighty God for the precious gift of life, were it not for Him undertaking this study would not have been possible.

Special thanks to my supervisor, Dr. Ronald Chogii, for his insightful guidance, feedback, and patience throughout this study. I appreciate his sharing of knowledge and dedication of his time throughout the entire project work.

DEDICATION

This research is dedicated to my wife Molly, my sons Junior and Jean for their prayers, encouragement, love and moral support throughout the time of study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

BCBS	Basel Committee on Banking Supervision
CBK	Central Bank of Kenya
DTMI	Deposit Taking Microfinance Institution
IOSCO	International Organization of Securities Commissions
MFI	Micro Finance Institutions
MPT	Modern Portfolio Theory
NPL	Non-Performing Loans
ROA	Return on Assets
ROE	Return on Equity
FP	Financial Performance

ABSTRACT

This study aimed to investigate the influence of credit risk management on the financial performance of deposit-taking microfinance institutions (DTMIs) in Kenya. Drawing on theories including credit risk theory, agency theory, and modern portfolio theory, the research sought to discern the intricate connections between credit risk management practices and financial performance outcomes within the microfinance landscape. Employing a descriptive research design, the study cantered on all 14 Central Bank of Kenya (CBK)-registered DTMIs. Secondary data extracted from CBK and MFIs' websites, along with annual reports, formed the basis of the analysis. The study spanned a decade, from 2013 to 2022. The findings unveiled a spectrum of financial performance, credit risk management, capital adequacy, liquidity, and interest rate spread across DTMIs. While the regression model demonstrated an ability to explain around 27.3% of financial performance variance, the F-statistic underscored a significant relationship between the combined effect of credit risk management, capital structure, liquidity ratio and interest rate spread on financial performance. The study revealed that credit risk management had a negative significant effect on the financial performance of Deposit-Taking Microfinance (DTM) institutions, emphasizing the need to enhance this practice by reducing the non-performing loan ratio, for improved financial outcomes. The research underscored a substantial positive correlation between interest rate spread and financial performance, signifying its significant effect on the financial outcomes of these institutions. Capital adequacy and liquidity ratio both demonstrated no significant influence on the financial performance of DTM institutions, suggesting limited impact on financial outcomes. The study suggested that policymakers focus on bolstering credit risk management policies, ensuring a balanced liquidity approach, and maintaining ethical interest rate spread management practices. Emphasizing strategies to enhance credit risk management and interest rate spread while ensuring stability in capital adequacy and liquidity levels is crucial for the reliability and financial outcomes of microfinance institutions.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The possibility that is associated with the potential loss that comes about from the failure of a bank borrower to meet expectations as obligated based on a previous agreement of terms is known as credit risk. The risk associated with the issuance of credit especially by banks is dire since it is the main source of profits for most if not all banks. The decision on whether or not to issue credit may seem straight forward but in practice it involves expertise and skills of discernment that determine the likelihood of the money being repaid (Brown & Moles, 2014). When the risk due to credit is maintained within the permissible limits as lenders seek to ascertain their risk adjusted rate of profits or return it is referred to generally, as credit risk management. Economic implications as caused by credit risks to lenders such as banks cannot be understated as their correlation seems to be indirect in nature since if the likelihood of risk in the context of credit is increased it will lead to a subsequent decrease in projected profit margins (Musyoki & Kadubo, 2012).

Several theories will be used to underpin the contents and findings of this study since they have been found to bear relevance to the actualization of this study. Melton (1974) introduced credit risk theory, which is the anchor theory of the study, in which he points to the nature of default of loan obligations to be the change or evolution of an asset owned by the borrower. The second theory underpinning this study is Modern Portfolio Theory (MPT) which was first introduced by Harry Markowitz (1952). The theory focuses on the diversification of portfolio investments to reduce risk and maximize returns. It can be applied to microfinance institutions by diversifying their loan portfolio to enhance economic performance and on the other hand gradually deal with the risks associated with the default of loans. The agency theory that was developed by Jensen and Meckling is the final theory that serves as a foundation for the

purposes of the topic of study. According to the agency theory, MFIs can increase their economic success through the coordination of the managements and the shareholders' interests. This can be accomplished through open communication, oversight and providing mangers with incentives to make decisions that are advantageous to all parties (1976).

The background that serves as the basis of this research undertaking is the need to ascertain the ramifications that accrue to performance of microfinance institutions in regard to management of risk associated with the issuance of loans. Credit risk management has been ascertained to lower the loss of revenue for institutions that deal with credit. In the past the lack of adequate management of risk associated with credit has led to dire situations for financial institutions especially during financial crises (Njanike, 2009). As the need for credit risk management becomes more apparent as it pertains to the scope of debt, equity and finance it is imperative that research is conducted on credit risk management as it relates to relatively smaller finance institutions.

1.1.1 Credit Risk Management

The activities that are involved with the management of risk associated with credit as defined by BCBS (2006) are the practices and processes used by banks to identify, assess, monitor, and control credit risk exposure. It involves the systematic evaluation of risk associated with loans and credit, the development of policies and procedures to manage that risk, and the on-going monitoring and adjustment of risk management strategies to ensure their effectiveness. Another definition of credit risk management according to IOSCO (2017) is the set of processes and systems used to identify, measure, control, and monitor the credit risk inherent in the activities, products, and services of an organization. A process that entails identifying and assessing credit risk, while also coming up with and establishing well laid out plans to manage that risk. Credit management can as well be termed as the manner in which finance institutions go about

ensuring that they can mitigate the loss that is accompanied with the default in loan repayments. The establishment of effective credit risk management entails the creation of an environment where credit risk is appropriate, maintaining a fundamentally sound oversight on credit that includes procedural tracking and subtle credit risk management while adhering to a specific credit giving procedure as well (Basel, 1999)

Credit risk management involves the incorporation of good underwriting practices such as documentation before the loan is issued and the actions that account for and necessitate action depending on the likelihood of the loan agreement being honoured. Credit risk management is an important process that begins with the identification of risk based on risk adjustments meaning that before the risk of issuing credit is realized proactive assessment of the transaction is required (Koulafetis, 2017). An assessment of the risk before the transaction is undertaken aids business organizations in choosing whether or not the risk matches the reward based on their business portfolio. The measurement and management of credit risk has become a vested interest for financial firms and organizations due to increased margins on loans and the decline in value of real assets among others (Altman & Saunders, 1997). Loans are one of the core industries of banking institutions and thus credit risk management is a key aspect endeavoured to ensure commercial success since the most successful banking institutions are those that can effectively assess and value the manner of risks (Weber, 2012). The outcome of the management of risk thus has to be ascertained so as to equip financial institutions with the ability to better the manner in which they issue loans to borrowers based on the assessment of potential loss.

The banking sector uses non-performing loans as a critical gauge of the extent to which risk management as it pertains to credit is needed. According to Adi, K., & Arokiasamy, M. (2017), NPLs are credit obligations or loans that are bordering on default or are already in default and are unlikely to be repaid in full. The ratio of NPLs to total loans provides a snapshot of a bank's

credit risk exposure and is used to evaluate its credit risk management practices. For example, a high NPL ratio suggests that the bank has poor credit risk management, which results in higher chances for loan defaults. Therefore, monitoring NPLs is imperative for financial institutions to assess their credit risk and make decisions about loan policies, loan pricing, and other aspects of credit risk management (Adi & Arokiasamy, 2017). The study therefore used NPLs ratio to operationalize credit risk management.

1.1.2 Financial Performance

Economic performance can be termed as the capability of a firm to create value for its shareholders by generating sufficient cash flows to cover its expenses, maintain solvency, and pay dividends (Fama & French, 2015). FP can refer to the ability of a firm to accrue revenue, manage expenses, and grow its assets over time according to Wild, Shaw and Chiappetta (2017). Bryner (2018) defined FP as the measure of the overall effectiveness of a company in generating income and maintaining profitability. On a similar note, the extent to which a company has achieved its objectives as gauged and presented in terms of money accrued as a subjective measure of profitability thus serving as an expression of its operations can also be used to define economic or financial performance (Harelimana, 2017). Economic efficiency and success is the attainment of a firm's completion for a given period based upon measures of finance (Fatihudin, 2018).

The economic performance of financial institutions is important as it helps firms as it aids a firm in gauging and ascertaining the extent of either profit or loss in the context of business operations. Financial performance requires an emphasis on comparison helping firms assess their evolution over periods of time rather than basing it off one period of loss or profit. Financial performance can also aid firms compare to those that they compete with in the same market (Chiarello et al., 2014). Indicators of financial performance thus may be unique in

nature to each firm necessitating that firms are equipped with the knowledge of what factors have an influence on the way the firm performs financially.

The measurement of financial performance can be varied as it is dependent upon the nature of the organization and which indicators accrue to the firm's business operations. Leverage and other various financial indicators are frequently employed so as to gauge the extent of performance. Particularly in self-sufficient MFIs, indicators like the appreciation that is observed on invested assets and capital investments have been found to be strong indicators of good economic performance (Tucker & Miles, 2004).

1.1.3 Credit Risk Management and Financial Performance

The primary objective of credit risk management is to limit the potential for monetary loss due to defaults on loans or other types of credit facilities. To successfully manage credit risk, financial establishments normally utilize a scope of strategies and techniques. A company's economic performance can be fundamentally be affected by the effectiveness that is employed in the management and mitigation involved in the limiting then risk associated with the issuance of credit. By limiting the risk of losses due to defaults, banks and other lenders can maintain profitability and mitigate the need for expensive capital reserves to cover potential losses (Stulz, 2008). Adenkule (2014) ascertained that the management of risk associated with credit possess a substantial bearing on the economic performance. Therefore, advising that banks and other similar financial institutions maintain a discernible level of bad loans while in the process of giving loam obligations to other customers. The economic success and output were found to significantly improve in the context of management of credit risk. This was perceivable through the positive effect it had on ROE which is imperative in gauging a firm's financial performance.

When credit and the risk associated with it are managed it can spur on economic development, produce an efficient amount of capital and wealth ushering in periods of economic prosperity. Credit in particular aids firms and companies to embark on or expand their businesses if they are able to assess the most profitable means to assess risk and manage it (Koulafetis, 2017). According to Chen and Yao (2017) institutions with strong credit risk management practices have a lower probability of loan defaults and, as a result, lower loan loss provisions. This leads to an improvement in their financial performance, including higher profitability and solvency. Farooq, Wang and Zhang (2019) suggest that financial firms and organizations with effective systems of managing risk tend to have better loan portfolios, lower non-performing loan ratios, and higher returns on assets. The financial stability and success of financial institutions is thus, as seen from the study findings, heavily dependent on the practices adopted to manage credit risk.

1.1.4 Deposit Taking Microfinance Institutions in Kenya

Microfinance institutions are providers of credit similar to banks but the loans are of a much smaller scale. What sets MFIs apart from traditional banks is the provision of credit for impoverished households and small-scale enterprises that may require credit but lack the collateral. They provide assistance to the disadvantaged in the society who may not have the collateral to take up loans with traditional banks (Hardy et al., 2002). The Central Bank of Kenya (CBK) lists 14 microfinance institutions that have been granted licences by the CBK.

Microfinance institutions go about the business of lending money to individuals who have a considerable amount of credit risk accompanying them since they lack the collateral for bank loans. This is in itself a challenge to the effectiveness of MFIs as many won't be able to develop a business model that is self-sustaining due to the high cost of providing financial services to the underprivileged (Tucker & Miles, 2004). The management of risk thus is of utmost

importance to MFIs as they go about assessing individuals that bear a considerable scope of risk due to their financial position, necessitating adequate skills of discernment and under writing to ensure that the loan obligations are met. Methods such as the issuance of group loans to lower the overall risk involved with the loan and the substitution of collateral are just but a few of the methods employed by MFIs to ensure that loan obligations are met (Ibtissem, & Bouri, 2013).

The precedent that necessitates the establishment of MFIs is income generating activities and small enterprises while in some cases providing banking services to those who cannot gain access to similar services from banks due to the lack of funds. The financial performance of MFIs takes a noted upturn when they diversify their portfolio and provide non-financial services **(**Daher, & Le Saout, 2013). However, the majority of profits and financial performance enhancements are dependent on the nature of their loans and whether they can set up a self-sustaining business model that is not solely set up for social outreach but can also become a well performing financial entity without the need for subsidies.

1.2 Research Problem

The research problem as it relates to the topic of study is to ascertain the correlation between the management of risk associated with credit and the financial success and output of Kenyan MFIs. The study seeks to address the research problem by investigating how practices involved in credit risk management affect how well MFIs perform financially. In a nutshell, the completion of this study is aimed at furthering the consensus of hoe imperative practices that involve the management of risk as it relates to credit in ensuring the financial sustainability and growth of MFIs, which play a critical role providing financial services.

The issuance of loans is accompanied by a considerable amount of risk associated with the potential that the loan obligations will not be met. This is especially an aspect that banking

institutions have to take into consideration since when the loan obligations are met on an aggregate scale, they constitute sources of profit and indicators of financial performance. The risk management connected with the issue of lending institutions in the scope of operations undertaken by lenders is thus a critical aspect in guaranteeing the profitability and excellent financial performance of their day-to-day business operations. The financial performance of banking institutions is becoming increasingly dependent on the manner by which they assess and deal with the risk of defaulted loans but the evolving nature of economics and the factors that influence it necessitate further research as firms seek to determine how well credit risk management actually influences their profitability (Kodongo & Kendi, 2013).

Microfinance institutions played a role in roughly 3.5% of Kenya's Gross Domestic Product in 2022, according to the Central Bank of Kenya (2022). They made up about 3.3% of Kenya's GDP in that year. The Gross Domestic product was contributed to in part in both the years 2019 and 2020 albeit low returns as they had 2,3% and 2.5% in the stake respectively. The low contributions can be attributed to the numerous challenges facing microfinance institutions. One of the major challenges is the lack of robust credit scoring systems, a lack of reliable credit information databases which makes it difficult to monitor loan repayment and poor loan underwriting practices as contributing to the high levels of loan defaults in the MFI sector. This makes it difficult for MFIs to assess the creditworthiness of their clients, leading to higher credit risk (Ariyo & Adebiyi, 2021). Another challenge is limited access to formal collateral, which makes it difficult for MFIs to secure their loans and manage their credit risk. These challenges result in an increase in loan defaults and negatively impact how well MFIs perform financially.

Kiarie (2017) conducted a study to find out whether profitability was the reason why MFIs had become progressively inclined to veer from the original essential objective to improve performance and profitability. Ogindo (2006) did research to measure the growth of MFIs in

Kenya. Notably, empirical evidence as it pertains to the theorized correlation between the processes of managing risk associated with credit and financial prosperity and performance is limited since, as it stands, few studies have examined the effect of management of credit risks within a financial institution on the financial prosperity of MFIs. Notably there is a research gap on the direct connection between the management of credit risks and the economic success and output of MFIs because the majority of the current studies focus on credit risks determinants or the impact of microfinance on the reduction of poverty. It is thus, these conceptual and contextual disparity that this research undertaking focuses to fill by arriving at the answer to the research question: What are the effects of credit risk management on the performance of deposit taking microfinance institutions in Kenya?

1.3 Objective of the Study

The main objective of the study is thus to ascertain the effect of credit risk management on the financial performance of deposit-taking microfinance institutions in Kenya.

1.4 Value of the Study

The findings of this study prove beneficial to various stakeholders and various individuals concerned with the operations of microfinance institutions that take deposits in Kenya and the world in general. The findings are also of aid to various scholars and academicians who will put to use the contents of this study. Students can use the conclusions of this study to form the gaps to be filled in the completion of their respective studies. The findings of this study also serve to uphold or conversely refute the theories that have be used to underpin the contents of this study forming a basis for the restructuring and the advancements of various hypotheses in the field of finance and academia in general.

The contents of this study are also of value to the institution under research. Microfinance institutions can use the conclusions that rare derived from the conclusion of this study.to arrive

at a definitive conclusion of how and to what extent credit risk affects performance and profitability. The findings of this study also help the management teams and stakeholders at various MFIs to ascertain the most suitable credit risk management practices that yields the highest levels of productivity, profitability and performance while also serving the cause in helping the employees of MFIs tasked with the determination of credit risk better their skills in underwriting and the process of claims.

The study findings also prove to be of value to the governmental and regulatory bodies tasked with maintaining the baking sector in Kenya. The findings can influence the implementation of interest rate across the board as the CBK becomes more aware of the effect of increase in bad loans and the risk the lack of fulfilment poses to credit issuing institutions. The study's findings can also from the basis for establishing a framework that can aid MFIs enhance their credit management processes. A framework that when regulated by the relevant bodies can ensure that MFIs continue on their mission which is to provide credit to marginalized and disaffected groups.

CHAPTER TWO: LITERARTURE REVIEW

2.1 Introduction

Literature review provides a comprehensive overview of the existing studies and research related to the topic being studied. It highlights the key theories, and empirical research that bears relevance the research topic and identify areas in which further research is required. The chapter as well discusses the determinants of the economic performance of MFIs and concludes with the conceptual framework of the study.

2.2 Theoretical Review

This chapter section goes about examining the postulations that are relevant to the topic of study. These theories are the credit risk theory, the agency theory and the modern portfolio theory MPT. This section will therefore discuss their relevance to the study and their criticisms.

2.2.1 Credit Risk Theory

Credit risk theory which is the anchor theory of this study, was first introduced by Melton (1974) who defined it as the uncertainty that a borrower may not be able to meet his debt obligations. Melton argued that credit risk arises when a borrower is unable to repay a loan due to various factors, including financial difficulties, illness, death, or bankruptcy. He proposed that credit risk can be managed by evaluating the propensity of a borrower to meet the loan obligations, and by charging a higher interest rate for higher-risk borrowers. Credit risk theory refers to the study of the potential losses that may occur due to default or non-payment of a loan by a borrower (Jarrow & Turnbull, 1995). This theory is used to analyse the likelihood of an individual who takes up a loan to meet the obligation and the results or the risks that may be involved should there be a default in payment. The credit risk theory is based on several factors, including the borrower's history with credit obligations, salary and current occupation,

status, and collateral offered as security for the loan (Kulick, 1997). The theory also considers external factors such as economic conditions, market conditions, and the extent of market competition.

Credit risk theory highly relates to the research topic as the capability of MFIs to manage credit risk effectively is crucial for their financial sustainability and profitability. By using credit risk theory, MFIs can assess the creditworthiness of potential borrowers and make informed lending decisions, which will improve the economic efficiency across the board while also reducing the risk associated with loan defaults (Wang, Cai & Zhang 2020). Moreover, credit risk management practices, such as loan diversification, proper loan underwriting, and monitoring of loan portfolios, can help MFIs to alleviate credit risk and minimize the potential impact of default on their financial performance. Hence, credit risk theory fulfils a vital function in ensuring the financial stability and success of MFIs in Kenya.

Credit risk theory has received criticism for its limitations in accurately predicting the risk of loan default and its oversimplification of the complex and dynamic nature of credit risk. Critics argued that credit risk models were based on assumptions that may not hold in real-world situations and that they often ignored important factors that impacted the risk of loan default (Adrian & Brunnermeier, 2011). Credit risk theory has also been criticized for its reliance on historical data and its inability to account for changes in the market and economic conditions (Chen & Feunou, 2018). Furthermore, some critics argued that credit risk models may not be appropriate for use in emerging markets, where the level of financial literacy and the regulatory environment differed from those in developed markets (Iyengar & Mittoo, 2016).

2.2.2 Modern Portfolio Theory

MPT was first introduced by Harry Markowitz (1952). The theory focuses on diversification of portfolio investments to reduce risk and maximize returns. It can be applied to microfinance

institutions by diversifying their loan portfolio to mitigate credit risk and improve economic output. Modern Portfolio Theory (MPT) is a widely used investment framework that assumes that rational investors aim to maximize their expected returns while minimizing risk (Markowitz, 1952). MPT suggests that diversifying a portfolio of assets can reduce the overall risk of the portfolio, as the returns of different assets tend to be uncorrelated (Black, 1972). This theory is based on the idea that a well-diversified portfolio will have a lower risk than a portfolio that is invested in a single security. MPT also brought forth the concept of the efficient frontier, which presents graphically the highest expected rate of returns as it relates to a given extent of risk for particular portfolios (Sharpe, 1964). MPT has been widely adopted by investors and financial advisors as a way to optimize portfolios and make informed investment decisions.

Modern Portfolio Theory (MPT) is a relevant framework for the ascertaining the extent to which the connection between the practices involved in managing credit and the economic success of financial institutions are related and the topic under study in Kenya. According to Markowitz (1952), MPT proposes that the expected returns of a portfolio of assets can be optimized by selecting the most appropriate combination of assets based on their individual expected returns and risk levels. This theory can be applied to MFIs by considering credit risk management as an important factor in the portfolio optimization process. By incorporating credit risk management into their portfolio selection process, MFIs can balance the trade-off between risk and reward, thereby improving their financial performance. Implementation of effective credit risk management practices in MFIs may lead to improved financial performance, including increased profitability and sustainability.

Despite the widespread use of Modern Portfolio Theory, MPT has been subject to criticism over the years. One common criticism is that MPT assumes that investment decisions are rational and with expected returns and risk acting as the source of motivation for such decisions,

ignoring behavioural factors that can influence investment decisions (Shiller, 2000). MPT assumes that financial markets are efficient in nature and that all information that pertains to them is presented as such with them being reflected in the asset prices, and that asset returns are normally distributed, which has been challenged by empirical evidence. Critics also argue that MPT does not account for non-systematic risk, such as political or economic events, which can have a significant impact on portfolio performance (Black, 1972).

2.2.3 Agency Theory

The agency theory was first posited by Jensen and Meckling (1976). Agency theory suggests that MFIs can improve FP by aligning the interests of shareholders and management. This can be achieved through clear communication, monitoring, and incentives for managers to make decisions that benefit both parties. Agency theory is widely used in the field of organizational behaviour and management to analyse how principals and agents in organizations interact within majority of organizations. The theory posits that conflicts of interest can arise between these two groups, and that incentives and monitoring mechanisms can be used to align their interests (Jensen & Meckling, 1976). The team of managers may act as the agents in an organization while the shareholders act as the principals. The shareholders may provide incentives, such as bonuses or stock options, to motivate the management team to act in their best interests. At the same time, the shareholders may also use monitoring mechanisms, such as shareholder meetings and audits, to ensure that the management team is acting in a way that benefits the shareholders. The use of agency theory can therefore, provides a framework for understanding how to balance the interests of different stakeholders in an organization.

The relevance of the agency theory as it pertains to the connection that is prevalent between the management of credit risk and the economic performance of firms has been widely studied. The theory provides a framework for understanding the conflicts of interest that can arise

between microfinance institutions (principals) and their clients (agents) when providing loans. The use of incentives, such as charging higher interest rates for riskier loans, can help to align the interests of microfinance institutions and their clients, but it may also limit the ability of low-income clients to access credit. Additionally, monitoring mechanisms, such as regular loan repayment monitoring, can help to ensure that clients are using the loans as intended and repaying them on time. The relevance of agency theory in this context provides valuable insights into the trade-offs involved in credit risk management in microfinance institutions (Mersland & Strøm, 2009).

Agency theory has been criticized for several reasons. Some argue that the theory oversimplifies the relationship between principals and agents by assuming that their goals are always at odds (Jensen & Meckling, 1976). Agency theory assumes that the only way to align the interests of the two parties is through incentives, such as bonuses, but this overlooks other factors that can motivate agents, such as a sense of duty or a desire to maintain a good reputation (Fama & Jensen, 1983). Furthermore, the theory has been criticized for ignoring the role of other stakeholders, such as employees, customers, and suppliers, who may also have a significant impact on a firm's output (Williamson, 1985). Despite these criticisms, agency theory remains a widely studied and influential approach to understanding the relationships between principals and agents in organizations.

2.3 Determinants of Financial Performance

The study addressed the following factors affecting economic efficiency and success of Microfinance institutions in Kenya. These factors include credit risk management, capital adequacy, liquidity management and interest rate management.

2.3.1 Credit Risk Management

Credit risk can be termed as the risk that is associated with a borrower who is incapable and thus will not pay their debts on time, resulting in the lender going at a loss of some or all of the loan's principal. It is thus pertinent, that financial institutions assess borrowers' creditworthiness before granting credit, in order to mitigate such losses (Brown and Moles, 2014). The borrower's credit history, income, and other financial factors are all evaluated as part of the credit risk assessment. An individual’s ability to honour a loan obligation maybe dependent upon the economic environment and the industry trends that the lender may take into consideration (Avery et al., 1996). There are two primary classes of risk associated with credit: portfolio credit risk and individual credit risk. Portfolio credit risk is the risk associated with a group of loans or borrowers, whereas individual credit risk is the risk as it relates to a single borrower or loan (Wilson, 1998).

Gregory (2010) indicates that credit risk can be managed through different techniques, for example, credit scoring models, credit limits, loan contracts, and collateral prerequisites. Financial establishments may likewise utilize credit derivatives, for example, credit default swaps (CDS) to transfer credit risks to other parties. Likewise, by routinely monitoring loan portfolios and executing suitable loan management techniques, microfinance institutions can successfully deal with their credit risk and lessen default rates (Abdullah et al., 2020). Effective management of credit risk management is essential as it also enhances the stability and profitability of microfinance institutions, thereby attracting more clients and improving their overall financial performance.

2.3.2 Capital Adequacy

Capital adequacy is a critical factor that affects the economic output of microfinance institutions (MFIs). It refers to the minimum amount of capital that MFIs must hold to be able

to operate in a financially sound manner and to meet the needs of their clients (Beck, Demirgüç-Kunt & Pería, 2009). Adequate capital levels are essential for MFIs to mitigate potential losses, to ensure the sustainability of the MFI and its ability to grow, and to provide a cushion for unexpected events (Khumalo, 2011). As it pertains to MFIs with relatively high capital adequacy ratios, they comparatively seen to perform better financially than those with lower ratios. This is because they are better equipped to handle financial shocks, such as loan defaults or currency fluctuations, without compromising their operations or reputation.

MFIs with lower capital adequacy ratios are more susceptible to financial instability and are more likely to face solvency issues, which can negatively impact their financial performance (Beck, Demirgüç-Kunt & Pería, 2009). This highlights the importance of MFIs maintaining high capital adequacy ratios, which is a key illustrator of their financial health and stability. Capital adequacy is therefore, an important factor that affects the economic output of financial institutions as a whole which is measured by calculating two ratios; capital-to-asset or capital-to-risk-weighted assets ratios.

2.3.3 Degree of Liquidity

The degree of liquidity essentially affects the financial performance of an undertaking, as it entails its capacity, when obligations are due, to meet them financially. A high degree of liquidity implies that the venture has adequate cash and other liquid assets to meet its immediate obligations without selling off its assets or borrow more cash (Song'e, 2015).

Micro Finance Institutions need to maintain an optimum degree of liquidity to guarantee that they can meet the need for loans and other monetary services from their clients. Be that as it may, excessive liquidity van affects the FP of the MFI in a negative way. One of the primary ways by which a high level of liquidity can affect the FP of an MFI antagonistically is by decreasing profitability. At the point when a MFI has excess liquidity, it may have decided to

hold more money or other low-yield liquid assets, which can diminish its profitability. This is on the grounds that the MFI is procuring a lower return on its assets than it could on the off chance that it had put those funds in higher-yielding loans or other viable ventures (Ledgerwood, 2013).

The financial performance of an MFI might also suffer from a low level of liquidity, on the other side. An MFI may be obliged to turn away potential customers or postpone the delivery of loans if it does not have enough cash to fulfil the demand for loans and other financial services from its consumers. This may lead to diminished profitability and lost business. As a result, MFIs must strike a balance between maintaining a certain amount of liquidity to guarantee they can satisfy customer demand while also investing their money in higher-yielding assets to increase their profitability (Mwangi, 2014). According to Mohanty and Samantray (2018) having an optimum degree of liquidity allows MFIs to ensure timely repayment of depositors, manage risk and maintain solvency, which are essential for the financial performance.

2.3.4 Interest Rate Spread

Interest rate spread of refers to the difference arrived at when the interest rate charged on loans is subtracted to that which is paid on deposits. The spread has substantial implications on the profitability and continuity of MFIs, making it a significant factor in determining their financial performance (Bengi & Njenje, 2016).

If the interest rate spread is positive, MFIs are lending money at a greater rate than they are paying on deposits. Higher profitability may result from this, allowing MFIs to continue operating and broaden their client base. A big interest rate spread, however, can also be reason for alarm since it can mean that MFIs are charging their consumers, particularly the poor and vulnerable, exorbitant interest rates. This might result in customer over-indebtedness and

default, which would eventually harm MFIs' capacity to maintain their financial viability (Ngumi, 2014). Argüello et al. (2013) clearly indicate that, while determining their lending rates, MFIs must strike a balance between profitability and client welfare. This necessitates a thorough awareness of the local market circumstances, their clients' demands and capacities, and the cost of providing financial services.

Notably, one of the major factors affecting how financially successful MFIs are is the interest rate spread. Although higher profitability and sustainability can result from a positive spread, it is crucial for MFIs to make sure that their interest rates are fair and reasonable and do not push their clients into over-indebtedness or default.

2.4 Empirical Studies

From the global perspective, a study was conducted in Bangladesh to ascertain the implications of management of risk associated with credit on the output and success of microfinance organizations by Hossain (2019). The study made use of secondary as relayed from Bangladesh’s central bank and microfinance institutions adopting a quantitative approach. Thus, the researcher went about determining the extent of the implications of credit risk management by applying regression analysis. A significant correlation and impact on financial performance was established between the FP and credit risk management in the context of institutions that offer services associated with microfinance. The review of the research undertaking revealed that it is limited to the microfinance sector in Bangladesh and may not be generalizable to other countries or regions. Further research could investigate the implications of credit risk management in other countries and regions, using a comparative approach.

Chang (2021) conducted a recent study in Asia whose aim was to analyse the extent to which the correlation between practices involved in management of credit risk and economic performance interacted and affected one another as it pertains to selected microfinance

institutions. The relationship between economic performance indicators was established through the use research design through subjecting the data that was collected through regression analysis to arrive at a correlation with management of credit risk. The completion of the study ascertained a beneficial relationship as it relates to the interaction between economic performance and practices involved in the management of risk brought about by the issuance of credit. A notable relationship that was much stronger was established for ROA compared to ROE highlighting the importance of implementing mitigation measures for the risk associated with credit and its management. This study was done in Asia whose results cannot be generalized for all microfinance institutions in all countries.

Ogundele (2020) undertook research so as to ascertain and conclusively determine the implications of practices involved in credit risk management as they pertain to and affect institutions that offer microfinance solutions in Nigeria. The data for the purposes of the study was obtained from the Nigerian Central Bank making use of a quantitative approach in obtaining secondary data. The study ascertained that economic performance had a substantial connection to credit risk management with a positive correlation to the former. The results suggest that a well-implemented credit risk management system can enhance the ROA and ROE of microfinance institutions, leading to increased financial stability and sustainability. The study is limited to the MFIs in Nigeria and may not be generalizable to other countries.

Molapo (2020) aimed to assess how the practices involved in credit risk management affected the economic output and success of institutions that are involved with microfinance in South Africa. The study used quantitative research design as well as collected data from microfinance institutions through structured questionnaires. The study established a connection that proved to be positive between the economic performance of microfinance institutions in South Africa and the practices involved in credit risk management. Molapo (2020) arrived at the conclusion that it was imperative for firms and organizations involved in microfinance institutions to adopt

sound practices in the mitigation of the risk factor associated with credit in order, in part, to ensure economic success. This study highlights how imperative credit risk management is in the microfinance sector and the need for institutions to adopt effective credit risk management practices to improve their economic performance. The study was done in another country hence the need to carry out a similar study in Kenya in order to compare results.

The management of risk as it pertains to the risk associated with credit and the structure of capital and how they affect the economic performance of institutions that dela with microfinance institutions in Uganda were the subjects of a study conducted by Orichom and Omeke in 2021. In order to investigate 64 MFIs, the study used a cross-sectional research approach. Data analysis techniques used included correlation and multiple regression method. The findings show a critical role for credit risk management in stable economic performance. Second, the correlation between capital structure and economic output and success is not particularly strong. To ensure that MFIs have a healthy financial performance, credit risk monitoring, reduction, and assessment are crucial. The study reveals a methodological and contextual gap to be addressed by using different methodology to carry out a similar study in a different context.

In Kenya, studies have been carried out related to the current study topic. Gatuhu (2013) carried out a study to examine how credit management affected the economic success of Kenyan microfinance institutions. Descriptive survey methodology was used for the investigation. 59 AMFI-member MFIs in Kenya made up the study's sample population. In order to conduct the study, a census was performed. Through the use of questionnaires, primary data was gathered that covered every topic on the list. The data was examined using descriptive statistics. In addition, explanations based on the data from the tables were created. According to the report, MFIs in Kenya's financial performance is highly influenced by evaluation of the loanees, practices adopted in the management of risk, and policies adopted during collection.

When the MFIs adopt a strict collection policy as it pertains to debt it was found to be more effective than practicing leniency of which it was definitively established that collection policies had a substantial effect on the economic success as well as output. A time gap to be filled by the completion of the current study arises since the study under review was conducted in 2013.

In Korir's (2014) study, the central bank-licensed deposit taking microfinance institutions (DTMI) were examined to ascertain whether financial success and output was in any way affected by the practices adopted in the management of risk associated with the issuance of credit. Making use of questionnaires for the purposes of the study it consequently used a descriptive research design as its method of investigation. The yearly disclosures of the DTMIs authorized by the Kenyan Central Bank (2011–2014) were used as secondary data. The study focused on the 6 DTMIs because comprehensive data from 6 of the 9 licensed DTMIs in Kenya could be obtained. Using multiple regression analysis, the information gathered from the DTMIs' annual reports was examined. The study established that factors important to managing credit risk such as default rate, bad debt cost and cost per loan asset increased as the economic success and output of DTMIs dwindled with the inverse also holding true. Additionally, the study's findings suggested that MFIs employ credit risk management. Notably, definitively ascertained that operational, credit, liquidity, and interest rate risks all have an impact on how well MFI loan’s function. The study specialised with DTMIs and failed to consider other MFIs in Kenya.

As it pertains to the economic success of microfinance firms in Nairobi, Paul and Musiega (2020) evaluated the impact of credit risk management strategies. In particular, research intended to ascertain how credit risk grading techniques, viability identification practices, credit risk control activities, and credit reminder practices affected the economic performance of Kenyan microfinance banks. Information asymmetry theory, adverse selection theory, and

contemporary portfolio theory were all applied in the study. The sample size was 96 respondents. The study used questionnaires to gather primary data, focusing particularly on branch managers and credit managers in each branch. The population for this study was therefore 1147 employees in the micro-finance institutions in Nairobi. Statistics were used in the investigation, both descriptive and inferential. According to the study the economic performance of institutions that offer microfinance in Kenya were significantly impacted upon by the management risk techniques studied. Techniques such as credit risk; grading viability identification, control, and last but not least credit reminders

2.5 Summary of the Literature Review

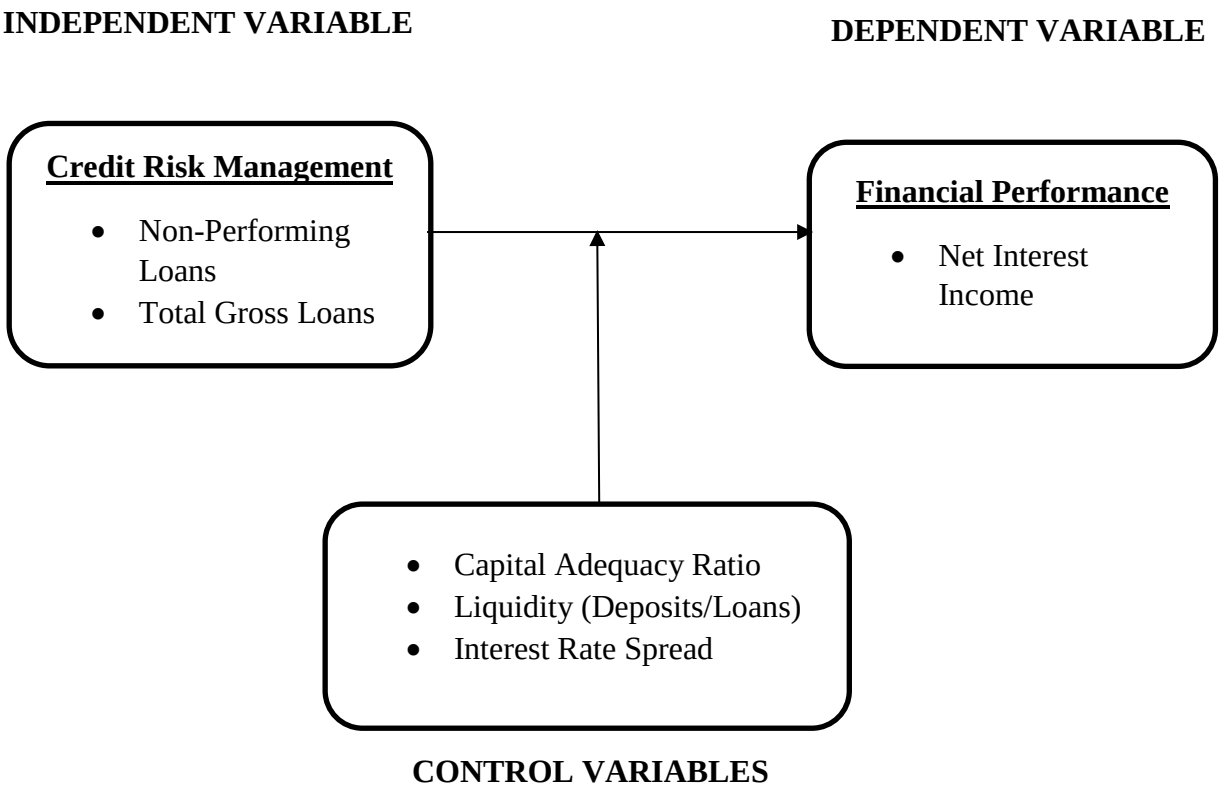
The postulations of the credit theory are focused upon the instance when loans are defaulted upon by borrowers causing potential and at times sure losses for financial institutions. The theory posits that the improvement of the economic performance of such a firm hinge upon its ability to effectively gauge, identify and control the credit risks. This is crucial for Kenyan microfinance institutions, as they are often exposed to higher levels of credit risk due to their target market of low-income individuals who may have limited collateral and limited repayment capacity. Modern portfolio theory suggests that by diversifying a portfolio of loans, an organization can reduce the impact of loan defaults and improve its financial performance.

This is particularly relevant to firms that offer microfinance services in Kenya as they often offer a variety of loan products and services, which allows them to diversify their portfolio and reduce the impact of loan defaults. Agency theory on the other hand, focuses on the relationship between principal and agent, with the principal being the owner of the organization and the agent being the management. Agency theory argues that the mark of truly efficient management of risks associated with credit is the alignment of the interests of management with those of the owner, thereby improving the FP of the organization.

The chapter discusses the theories associated with the research topic as well as the factors influencing the financial viability and success, empirical studies associated with the study topic and the knowledge gaps that need to be filled for the purposes of future research. The current study has identified a contextual and methodological gap where some of the studies that have been done cover varying contextual instances as well as using different methodology in the analysis which may not reveal similar findings. Although the study topic has been done by several researchers in Kenya, the findings may lack generalizability for all studies due to time differences, accuracy and methods of data collection used which raises the need to undertake such a similar study in the present time.

2.6 Conceptual Framework

Figure 2. 1: Conceptual Framework



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter entails the research methodology that was chosen for the purposes of the completion of this study that were used to meet its objectives. The research design, the population targeted, method of collecting data, diagnostic tests and the methods of analysis.

3.2 Research design

It is the framework that helps to decide on data collection and the appropriate technique to analyse the data. The research design comprises of techniques and procedures used for collection and data analysis which helps in answering the research question (Dulock, 1993).

The study applied a descriptive research design to illustrate the characteristics of the population (Dulock, 1993). It was found appropriate for the study as it helped answer how the management of risk affects financial operation of microfinance institutions. It helped in getting more information on the study variables in order to establish their relationship.

3.3 Population

Population can be described as the entire group of people, things or events which have a particular trait or combination of traits that draw the interest of any research undertaking. It is comprised of the target group that the researcher intends to draw conclusions from. All of the firms that offer microfinance solutions in Kenya and have been registered with the CBK were included in the study population. Thus, this study focused on all 14 CBK-registered deposit-taking microfinance institutions. The study thus took into consideration conducting a census study since the population size is small and manageable.

3.4 Data Collection Method

Secondary data was utilized, and it was extracted from CBK website, respective MFIs website and annual reports of the individual microfinance institutions in Kenya using a data sheet. The study utilized cross-sectional data collected for a period of 10 years (2013- 2022). The study collected data on the study variables which include profits, total assets, total NPL, total cash, total deposit, capital and total loan. CBK interest rate and MFI interest rates.

3.5 Diagnostic Tests

Some diagnostic tests were performed to measure the robustness of the regression model that were used. These tests include normality, linearity, autocorrelation, heteroskedasticity and multicollinearity test.

3.6 Data Analysis

The researcher cleaned up the acquired data and ensure that it is complete. The researcher also calculated the response rate to see if the data collected is sufficient for the investigation. The researcher analysed the data using descriptive and inferential statistics in SPSS version 23. Descriptive statistics involved the measurement of such as mean, median, mode, and standard deviation, which was incorporated to describe data acquired. Correlation and regression analyses, on the other hand, was applied as the inferential statistics. The study was employed correlation analysis to assess the magnitude and direction of the connection between the predictor and dependent factors. Additionally, regression analysis was utilized to model and investigate the dependent variable and the independent factors relationship considered in the study.

3.6.1 Analytical model

The correlation between the dependent variable which is financial performance and the dependent variables which are credit risk management, capital adequacy, liquidity management, financial inclusion and interest rate management were determined by multiple regression model.

The regression model below explains the anticipated results.

$Y= \beta\ 0 +\beta 1\ X1+ \beta 2\ X2+ \beta 3\ X3+ \beta 4X4 + \varepsilon$

$\beta 0$ represent regression coefficient and $\beta 1$, $\beta 2$, $\beta 3$ and $\beta 4$ represents the gradient of the regression equation.

Where:

Y- Financial Performance (Net Interest Income)

X1 – Credit Risk Management (Total NPL/ Total Loan)

X2 - Capital Adequacy (Capital Adequacy Ratio)

X3 – Degree of Liquidity (liquidity Ratio)

X4 – Interest Rate Spread (Interest on Loan-Interest on Deposit)

ε - The error term

3.6.2 Test of Significance

An ANOVA test with a 95% confidence level will be used in the study to ascertain the model relevance. If the test produces a significance value below 0.05, the null hypothesis will be rejected which shows that the model is significant. As a result, the null hypothesis will not be

accepted and the model will be deemed to be insignificant if the significance value is more than 0.05.

3.6.3 Normality Test

Normality test ascertains if a dataset follows a normal distribution. Various techniques can be utilized, including statistical tests such as the Shapiro-Wilk and Kolmogorov-Smirnov tests, as well as visual examination of histograms and probability maps. In this research, the computed test statistic will be compared to a critical value using the Shapiro-Wilk test, to ascertain if the data exhibit normality. If the p-value derived from the Shapiro-Wilk test is below 0.05, it indicates that the sample data deviates from a normal distribution (Shapiro Wilk & Chen, 1968).

3.6.4 Linearity Test

The linearity test serves to identifying the existence of a linear relationship between two variables. It is crucial to confirm the linearity of variables prior to applying a linear regression model. As postulated by Hair et al. (2017), the linearity of variables is evaluated either visually through a scatter plot or statistically using Pearson's correlation coefficient test. The correlation coefficient ascertains the strength and direction of the linear connection between two variables. A value close to 1 showcases a strong linear relationship, while a correlation of 0 signifies the absence of a linear connection.

3.6.5 Test of Autocorrelation

Autocorrelation, pertains to the extent of association between different time points within a time series. Autocorrelation analyses serve the purpose of assessing if there exists a notable correlation between the data points in a time series, thus influencing the reliability of statistical inferences made. The Durbin-Watson test is a well-known autocorrelation test that computes a

test statistic based on first-order differences in residuals from a regression model. The test statistic is then compared to critical values to determine whether there is significant autocorrelation. Testing for autocorrelation in time series data is critical for assuring statistical validity and identifying potential data issues (Hamilton, 1994).

3.6.6 Heteroscedasticity Test

In linear regression, heteroscedasticity arises when the variance of the residuals does not stay consistent across all levels of the independent variable. Consequently, it is essential to conduct tests to detect heteroscedasticity. One approach for assessing heteroscedasticity is the Breusch-Pagan test, which examines whether the variance of the residuals is associated with the independent variables. The test involves regressing the squared residuals on the independent variables and subsequently assessing the significance of the resulting F-statistic (Baltagi, 2013).

3.6.7 Multicollinearity Test

The statistical issue related to multicollinearity arises when two or more predictor variables in a regression model are highly correlated. Multicollinearity is commonly tested using variance inflation factor (VIF). VIF measures how much the variance of the estimated coefficient of a variable increase when that variable is added to the model, while controlling for all other predictors. A VIF greater than 5 or 10 indicates a problematic level of multicollinearity. The Multicollinearity Test is carried out by calculating the VIF for each predictor variable in a regression model, and interpreting the results to determine if there is a significant level of multicollinearity present. Properly addressing multicollinearity is important in regression analysis because it can affect the stability and accuracy of the estimated regression coefficients (Daoud, 2017).

CHAPTER FOUR:DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presented a thorough and structured account of the data analysis process, closely linked to the study's objective. The analysis progressed through distinct phases, starting with descriptive evaluation and diagnostic tests which preceded the application of inferential statistics. It further included an investigation into correlations and regression analysis. The chapter culminated in a comprehensive summary that encapsulates the pivotal findings and insights gleaned from the data analysis endeavour.

4.2 Data Response

The study focused on 14 microfinance institutions in Kenya, with the objective of gathering 10 years' worth of data. Ultimately, data was effectively collected for 8 years from 12 microfinance institutions, retrieved from their annual supervision reports. This yielded a data response rate of 68.6%, a rate that was deemed suitable for the research's purposes.

4.3 Descriptive Statistics

The study successfully acquired data for the study's variables, encompassing Y - Financial Performance derived from the percentage total profit or loss divided by total assets, X1 - Credit Risk Management derived from percentage total net NPL divided by total amount of loans issued to customers, X2 - Capital Adequacy obtained from percentage total capital divided by total risk weighted assets, X3 – Liquidity Ratio obtained from liquidity ratio, and X4 - Interest Rate Spread obtained from percentage interest rates on loans minus interest rates on deposit. Subsequently, the obtained data underwent a descriptive analysis to evaluate its distribution in terms of minimum, maximum, mean and standard deviation.

Table 4. 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	St. Error
Y= Financial Performance	96	-127.78	15.58	-9.1895	19.2167	-3.350	.246	16.026	.488
X1 = Total NPL/ Total Loan	96	0.0000	76.92	16.9664	17.0093	1.337	.246	1.558	.488
X2 = Capital Adequacy Ratio (%)	96	-332.00	266.00	21.7743	66.6107	-1.866	.246	12.248	.488
X3 = Liquidity Ratio	96	1	720	51.48	86.713	5.710	.246	39.112	.488
X4 = Interest on loan - Interest on Deposit	96	-5.00	67.36	10.5721	11.8766	2.665	.246	9.045	.488
Valid N (listwise)	96								

Source: Researcher (2023)

The financial performance variable (Y) was analysed using a sample size of 96. The minimum value observed was -127.78, while the maximum value was 15.58. On average, the financial performance was negative, with a mean of -9.1895 and a standard deviation of 19.21657, indicating a considerable dispersion of data points. The skewness value of -3.350 suggested that the data was significantly skewed to the left, indicating a long tail on the negative side. Furthermore, the kurtosis value of 16.026 indicated that the distribution had heavy tails and was leptokurtic.

The minimum value observed for Credit Risk Management (X1) was 0, and the maximum value was 76.92. The mean credit risk management score was 16.9664, with a relatively high standard deviation of 17.009. The skewness value of 1.337 suggested that the data was positively skewed, with a tail on the right side. The kurtosis value of 1.558 indicated that the distribution was moderately leptokurtic.

In the case of Capital Adequacy (X2), The lowest recorded value was -332.00, while the highest value reached was 266.00. On average, capital adequacy was 21.7743, with a substantial standard deviation of 66.61067, highlighting wide variability in this variable. The skewness value of -1.866 indicated a negative skew, characterized by a left-skewed tail in the distribution. The kurtosis value of 12.248 indicated a leptokurtic distribution with heavy tails.

Liquidity Ratio (X3) indicated the lowest value observed was 1.00, and the highest recorded value reached 720.00. The average liquidity score stood at 51.48, with a standard deviation of 86.713. showing considerable variability in this variable. The skewness value of 5.710 suggested significant positive skewness is evident, signifying an elongated tail on the right side. The kurtosis value of 39.112 indicates a very leptokurtic distribution with extremely heavy tails.

Lastly, Interest Rate Spread (X4) indicated a low value of -5.00 and a high value of 67.36. The mean interest rate spread was 10.5721 with a standard deviation of 11.87616. The skewness value of 2.665 suggested a positive skewness, indicating a tail on the right side. The kurtosis value of 9.045 indicated a leptokurtic distribution with heavier tails than a normal distribution.

4.4 Diagnostic Tests

Prior to conducting inferential statistics and constructing a regression model, the study performed five essential diagnostic tests to ensure the robustness of their analysis. These diagnostic tests included tests for normality, multicollinearity, homoscedasticity, linearity, and autocorrelation. Conducting these diagnostic tests prior to inferential analysis bolstered the study's confidence in the robustness and validity of the subsequent regression model by ensuring that the underlying assumptions were met and that potential issues were addressed before drawing conclusions from the data.

4.4.1 Normality Test

The study employed the Shapiro-Wilk test to assess the data distribution normality in its variables. The Shapiro-Wilk test is a statistical test that evaluates whether a dataset follows a normal distribution. The study applied the test to each variable to determine if their distributions deviated significantly from a normal curve. The expected results from the test would indicate whether the p-values associated with each variable were greater than a pre-defined significance level (0.05). If the p-values were greater, it would suggest that the variable's distribution did not deviate significantly from a normal distribution, thereby satisfying the assumption of normality. Conversely, If the p-values fell below the predetermined significance threshold the variable's distribution would significantly deviate from normality, prompting the need for further consideration and potentially requiring transformations.

Table 4. 2: Normality Test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Y= Financial Performance	.232	96	.000	.676	96	.000
X1 = Total NPL/ Total Loan	.159	96	.000	.861	96	.000
X2 = Capital Adequacy Ratio (%)	.242	96	.000	.725	96	.000
X3 = Liquidity Ratio	.311	96	.000	.404	96	.000
X4 = Interest on loan - Interest on Deposit	.194	96	.000	.737	96	.000
a. Lilliefors Significance Correction						

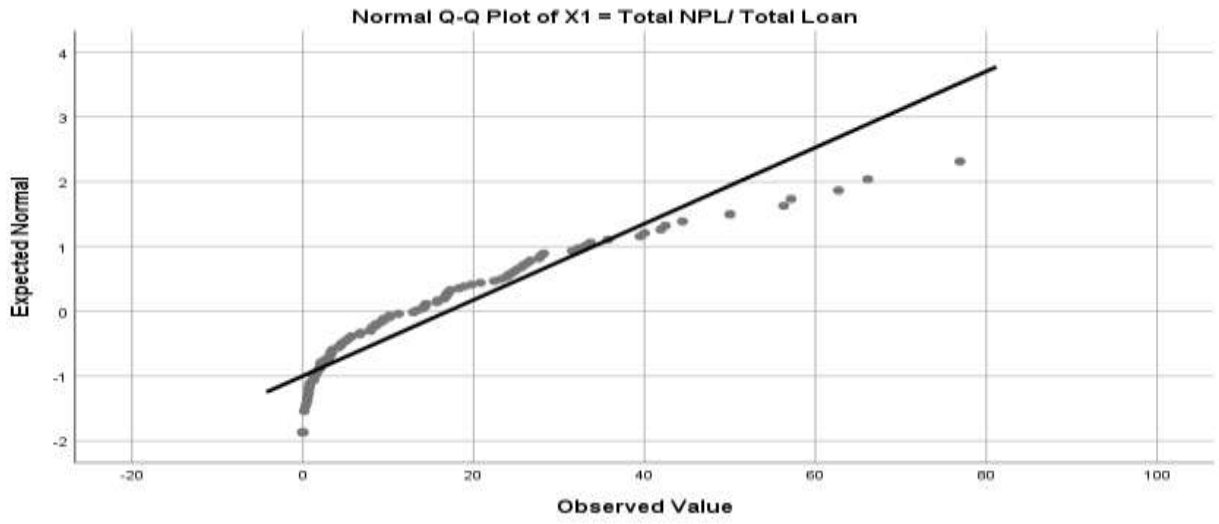
Source: Researcher (2023)

All variables in the table displayed significance levels below 0.05, indicating their departure from normal distribution. To address this, data standardization was performed as a transformation to mitigate the impact of non-normality on subsequent analyses.

4.4.2 Linearity Test

The study conducted the linearity test by plotting the scatterplots of each predictor variable against the outcome variable, aiming to assess if the relationships appeared to be approximately linear. In an ideal scenario, the scatterplots would exhibit a relatively constant spread of data points along a straight line. Deviations from linearity might indicate that the model's assumptions are violated, potentially leading to biased coefficient estimates and unreliable predictions. Thus, the expected results of the linearity test would be scatterplots that exhibit a consistent and linear pattern of data points, ensuring that the chosen regression model accurately captures the relationships between the predictor and the outcome variables.

Figure 4. 1: Normal Q - Q Plot



Source: Researcher (2023)

The data exhibited linearity as it closely adhered to a diagonal line in the scatterplots, indicating that the predictor and the outcome variable relationship were predominantly linear in nature.

4.4.3 Autocorrelation Test

The study conducted an autocorrelation test, specifically the Durbin-Watson test, to assess the existence of autocorrelation in the residuals of the regression model. The values range between 0 and 4, where a value around 2 showcasing no significant autocorrelation, while values deviating significantly from 2 highlighting the existence of autocorrelation. If the test indicates significant autocorrelation, values closer to 0 or 4, the study would need to address this issue. The study could consider transforming the data, adding lagged variables, or using more advanced modelling techniques such as autoregressive integrated moving average (ARIMA) modelling to account for the autocorrelation and ensure the reliability of the regression analysis.

Table 4. 3: Durbin-Watson Test

Model Summary[b]	
Model	Durbin-Watson
1	1.402

Source: Researcher (2023)

The autocorrelation test results, with a Durbin-Watson value of 1.402, suggested no significant autocorrelation in the regression model residuals.

4.4.4 Multicollinearity Test

The study undertook a multicollinearity test by calculating the (VIF) for each predictor variable in the regression model. The VIF assesses the extent of correlation between predictor variables, with a higher VIF indicating stronger multicollinearity. The VIF values for all independent variables are expected to be reasonably low, ideally below 10. Higher VIF values suggest high multicollinearity, which can undermine the stability of regression coefficients.

Table 4. 4: Collinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	X1 = Total NPL/ Total Loan	.897	1.115
	X2 = Capital Adequacy Ratio (%)	.712	1.405
	X3 = Liquidity Ratio	.682	1.467
	X4 = Interest on loan - Interest on Deposit	.920	1.087

Source: Researcher (2023)

The outcome of the multicollinearity test revealed that the independent variables within the regression model exhibited relatively low (VIF) values, all falling below 2.0. This suggests that multicollinearity was not a significant concern, underscoring that the independent variables were fairly independent and exhibited minimal correlation with each other.

4.4.5 Heteroscedasticity Test

The study conducted a heteroscedasticity test using the Breusch-Pagan test to assess the existence of unequal variance in the regression residuals. If heteroscedasticity was present, the Breusch-Pagan test would yield a statistically significant result, indicating that the assumption of consistent variance in the regression model was not upheld.

Table 4. 5: Breusch-Pagan Test

Breusch-Pagan Test for Heteroskedasticity[a,b,c]		
Chi-Square	df	Sig.
1778.947	1	.0000

Source: Researcher (2023)

The outcomes of the Breusch-Pagan test for heteroskedasticity indicated a statistically significant chi-square value of 1778.947 with 1 degree of freedom and p= 0.000. This outcome rejected the null hypothesis, implying that the variability of errors in the regression model was

influenced by predictor variables' value. In other words, there was evidence of heteroskedasticity in the model, suggesting a breach of the assumption of consistent error variance hence transformation of the data was necessary.

4.5 Correlation Analysis

Correlation analysis measures the strength and direction of linear relationships between pairs of variables. The study conducted correlation analysis to quantitatively assess the independent and the dependent variable relationship. By calculating correlation coefficients, the study tried to ascertain any significant associations between these variables, aiding in the understanding of determiners of financial performance and informing subsequent regression analysis.

Table 4. 6: Correlation Table

Correlations

			Zscore: Y= Financial Performance	Zscore: X1 = Total NPL/ Total Loan	Zscore: X2 = Capital Adequacy Ratio (%)	Zscore: X3 = Liquidity Ratio	Zscore: X4 = Interest on loan - Interest on Deposit
Spearman's rho	Zscore: Y= Financial Performance	Correlation Coefficient	1.000				
		Sig. (2-tailed)	.				
		N	96				
	Zscore: X1 = Total NPL/ Total Loan	Correlation Coefficient	-.245*	1.000			
		Sig. (2-tailed)	.016	.			
		N	96	96			
	Zscore: X2= Capital Adequacy Ratio (%)	Correlation Coefficient	.016	.082	1.000		
		Sig. (2-tailed)	.880	.427	.		
		N	96	96	96		
	Zscore: X3 = Liquidity Ratio	Correlation Coefficient	-.085	.259*	.544**	1.000	
		Sig. (2-tailed)	.410	.011	.000	.	
		N	96	96	96	96	
	Zscore: X4 = Interest on loan - Interest on Deposit	Correlation Coefficient	.634**	-.114	.226*	-.034	1.000
		Sig. (2-tailed)	.000	.268	.027	.740	.
		N	96	96	96	96	96

Source: Researcher (2023)

The independent variables exhibited various correlations with financial performance, as determined in the table above. The interest rate spread demonstrated a robust positive correlation with FP, yielding a significant correlation coefficient of 0.634. This relationship suggested that as interest rate spread increased, financial performance tended to improve. Conversely, credit risk management displayed a significant negative correlation with FP, underscored by a correlation coefficient of -0.245, signifying those higher levels of credit risk management were associated with diminished FP. However, the correlations observed with capital adequacy and liquidity ratio against financial performance were weaker and statistically insignificant, exhibiting correlation coefficients of 0.016 and -0.085.

4.6 Regression Analysis

Regression analysis investigates the relationships between variables and to ascertain the influence of one or more predictor variables on an outcome variable. Regression analysis was undertaken to explore and understand the potential influence of the predictor factors on the dependent factor of the study, thereby providing insights into how variations in the independent variable could explain change in the FP of the DTMFIs in Kenya.

4.6.1 Regression Model Summary

The regression model summary provides an overview of how well the model fits the data. It includes measures like R-squared and Adjusted R-squared portraying the level the predictor variables account for the variability in the outcome variable, offering insights into the model's explanatory power and potential over fitting.

Table 4. 7: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.523[a]	.273	.241	.87108788

Source: Researcher (2023)

The R-squared value for the regression model was 0.273, indicating that approximately 27.3% of the variance in financial performance (Y) was explained by the combined influence of the independent variables of the study. The Adjusted R-squared value was 0.241, slightly lower than the R-squared value. This suggested that although the independent variables in the model collectively accounted for a certain proportion of the variability in the dependent variable, some of the included independent variables did not contribute significantly to the explanation of variance. This difference between R-squared and Adjusted R-squared implied that not all independent variables were equally contributing to the model's explanatory power.

4.6.2 Analysis of Variance

(ANOVA) is a statistical method that compares means among two or more groups, to ascertain whether there are statistically significant differences among them by examining variations within and between the groups.

Table 4. 8: ANOVA Table

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.950	4	6.487	8.550	.000[b]
	Residual	69.050	91	.759		
	Total	95.000	95			

Source: Researcher (2023)

From the ANOVA table above, the regression model exhibited a statistically significant F-statistic of 8.550 with a corresponding p-value of 0.000. This low p-value suggests that the independent variables collectively had a significant relationship with FP, implying that the model as a whole had explanatory power, offering insights into the variation in financial performance.

4.6.3 Regression Coefficients

A regression coefficient quantifies the change in the value of the outcome variable for a one-unit change in a predictor variable, holding other variables constant. Its significance indicates if the predictor factor has a statistically meaningful impact on the outcome variable.

Table 4. 9: Regression Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.457E-17	.089		.000	1.000
	Zscore: X1 = Total NPL/ Total Loan	-.235	.094	-.235	-2.488	.015
	Zscore: X2 = Capital Adequacy Ratio (%)	-.089	.106	-.089	-.845	.400
	Zscore: X3 = Liquidity Ratio	-.178	.108	-.178	-1.641	.104
	Zscore: X4 = Interest on loan - Interest on Deposit	.338	.093	.338	3.628	.000

Source: Researcher (2023)

Table 4.9 provided the coefficients and their significance for the independent variables of the study. Credit risk management exhibited a coefficient of -0.235 with a p-value of 0.015, suggesting that it had a significant negative relationship with FP. Capital adequacy, with a

coefficient of -0.089 and a p-value of 0.400, portrayed a negative but insignificant effect on financial performance. Liquidity ratio exhibited a coefficient of -0.178 with an insignificant p-value of 0.104, highlighting an insignificant negative relationship with FP. Interest rate spread exhibited a significant positive coefficient of 0.338 with a high p-value of 0.000, signifying a substantial effect on FP. The study's results underscore that credit risk management and interest rate spread were the most influential predictors of FP, while, capital adequacy and liquidity ratio had non-significant effects on FP, transforming the regression model to: Y= -.235X1+ 0.338X4

4.7 Interpretation of Result Findings

The study's descriptive results underscored that the dependent variable, financial performance, had a wide spectrum of values, ranging from -127.78 to 15.58. The average value was -9.1895, with a standard deviation of 19.21657, signifying significant variability in financial performance. The skewness of -3.350 indicated a significant left skew, while the kurtosis of 16.026 suggested a leptokurtic distribution with heavy tails on the negative side. Moving on to the independent variables, credit risk management ranged from 0 to 76.92, with an average value of 16.9664 and a standard deviation of 17.009, indicating diverse practices of credit risk management. The skewness of 1.337 indicated a positive skew, while the kurtosis of 1.558 suggested a moderately leptokurtic distribution. Capital adequacy varied between -332.00 and 266.00, with a mean of 21.7743 and a substantial standard deviation of 66.61067, showcasing diverse capital adequacy levels. The skewness of -1.866 indicated a negative skew, and the kurtosis of 12.248 suggested a leptokurtic distribution with heavy tails. The liquidity ratio varied between 1.00 and 720.00, with an average of 51.48 and a considerable standard deviation of 86.713, showcasing significant variations in liquidity.

The skewness of 5.710 indicated a significant positive skew, while the kurtosis of 39.112 suggested a very leptokurtic distribution with extremely heavy tails. Regarding the interest rate spread, values spanned from -5.00 to 67.36, with a mean of 10.5721 and a standard deviation of 11.87616, indicating varied interest rate spreads. The skewness of 2.665 indicated a positive skew, and the kurtosis of 9.045 suggested a leptokurtic distribution with heavier tails than a normal distribution.

The Spearman's rho correlation coefficients unveiled a spectrum of associations among these variables. Notably, interest rate spread exhibited a robust positive correlation with financial performance, showcasing a substantial and statistically significant correlation coefficient of 0.634. This robust relationship indicated that an increase in interest rate spread corresponded to an improvement in FP. Conversely, credit risk management revealed a significant negative correlation of -0.245, suggesting that heightened levels of credit risk management were linked to diminished FP. However, the observed correlations between capital adequacy, liquidity and FP were not strong and lacked statistical significance, with correlation coefficients of 0.016 and -0.085, respectively. These insignificant associations indicated that capital adequacy and liquidity ratio did not serve as substantial predictors of FP within the context of DTMI.

The regression analysis revealed that the model accounted for approximately 27.3% of the variance in FP, as indicated by an R-squared value of 0.273. The Adjusted R-squared value, slightly lower at 0.241, suggested that while the independent variables collectively explained a portion of the variability in the outcome variable, not all of them significantly contributed to the variance explanation. The ANOVA table presented a highly significant F-statistic of 8.550, with a corresponding p-value of 0.000, signifying a strong collective relationship between the independent variables and FP. Findings pinpointed that risk management exhibited a significant negative relationship with FP, indicated by a coefficient of -0.235 and a p-value of 0.015. Capital adequacy, with a coefficient of -0.089 and a p-value of 0.400, showed a non-

significant negative impact on FP. The liquidity ratio had a coefficient of -0.178 with a non-significant p-value of 0.104, portraying an insignificant negative relationship. To add on, interest rate spread displayed a significantly positive coefficient of 0.338, with a high significance reflected by the low p-value of 0.000, indicating a strong impact on FP. Therefore, the results suggested that credit risk management and interest rate spread were the most influential predictors of financial performance.

In line with the findings of Chang (2021) in Asia and Molapo (2020) in South Africa, the current study established a notable relationship between effective credit risk management and FP in microfinance institutions. Results of the study revealed that a robust credit risk management approach had a positive and significant impact on FP, aligning with the positive correlation observed in both Chang's and Molapo's studies. Similarly, Hossain's (2019) study in Bangladesh resonates with these findings, reinforcing the importance of managing credit risk effectively for improved financial outcomes within microfinance organizations.

Moreover, the significant positive coefficient observed for interest rate spread in the current study aligns with the findings of Orichom and Omeke's (2021) study in Uganda. Both studies indicate that certain financial factors, particularly interest rate spread, have a substantial impact on FP within microfinance institutions. This alignment underscores the significance of certain financial indicators in influencing the overall performance of these organizations.

Contrary to the current study's results, Ogundele's (2020) research in Nigeria underscored that credit risk management and economic performance in microfinance institutions had a positive significant relationship. The study findings from Nigeria indicated a strong positive connection between effective credit risk management and FP, differing from the negative relationship observed in the current study. Similarly, Korir's (2014) study in Kenya, focusing on DTMIs,

highlighted the impact of credit risk factors on the institutions' economic success, which contrasts the negative relationship identified in the present study.

Additionally, while Paul and Musiega's (2020) study in Nairobi explored the impact of credit risk management strategies on the economic performance of Kenyan microfinance banks, the results of the current study regarding liquidity ratio demonstrated an insignificant negative relationship, differing from the observations in the Nairobi study. This indicates a discrepancy in the significance and the relationship between liquidity and FP between the two studies.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1: Introduction

The research encompasses a concise overview of the findings associated with the stipulated study objective, drawing conclusive insights from these outcomes. It encapsulates the study's implications, suggesting avenues for application and potentially influencing decision-making. Moreover, the study not only furnishes recommendations based on its outcomes but also identifies unexplored territories for future investigation, thereby contributing to the on-going advancement of knowledge in the field.

5.1 Summary of the Study Findings

The regression analysis highlighted that the model had the capacity to elucidate around 27.3 of the fluctuations observed in financial performance, as showcased by the R-squared value of 0.271. Additionally, the regression model underwent a statistical evaluation, yielding a noteworthy F-statistic of 8.550 with a p-value = 0.000. This outcome signified that, credit risk management, capital adequacy, liquidity ratio and interest rate spread collectively affected FP significantly.

5.1.1 Effect of Credit Risk Management on Financial Performance

The evaluation of the effect of credit risk management on FP highlighted varied practices within deposit-taking microfinance (DTM) institutions, suggesting differing degrees of success in controlling (NPLs). The study demonstrated significant variability in credit risk management across these institutions. The analyses indicated credit risk management and FP had a strong

significant relationship. Both correlation and regression analyses reinforced the pivotal role of effective credit risk management in enhancing FP within DTM institutions.

5.1.2 Effect of Capital Adequacy on Financial Performance

Capital adequacy was computed based on the ratio of total capital to total risk-weighted assets, displaying a wide range of values with substantial variability among the institutions studied. The variation suggests disparities in capital sufficiency among the institutions, with some potentially lacking the necessary capital to cover their risk-weighted assets, indicating concerns regarding financial stability. Notably, both correlation and regression analyses indicated capital adequacy and FP had a weak and non-significant relationship, reflecting a limited impact of capital adequacy on the FP of the DTMFIs institutions studied.

5.1.3 Effect of Liquidity Ratio on Financial Performance

The liquidity levels across DTM institutions varied significantly, as highlighted by considerable differences in liquidity ratios, indicating notable disparities in liquidity among these institutions. Despite the broad range of liquidity, the correlation analysis showcased liquidity level and FP exhibited a non-significant negative correlation, further supported by regression analysis, which confirmed the insignificant negative relationship. This implies that higher liquidity levels within DTM institutions do not necessarily correspond to better financial performance, as indicated by the insignificant negative coefficient for the relationship between liquidity and FP.

5.1.4 Effect of Interest Rate Spread on Financial Performance

The assessment regarding the impact of interest rate spread on FP within (DTMIs) showed a considerable range of values, signifying diverse practices across these institutions. This metric, reflecting the variance between loan and deposit interest rates, revealed a notable positive

correlation of significance with financial performance. The subsequent regression analysis confirmed a robust positive coefficient, highlighting the substantial influence of interest rate spread on the FP of DTMIs, suggesting that alterations in this spread significantly affected the FP of these institutions.

5.2 Conclusion

From the study findings, the research concluded that credit risk management had a significant negative effect on the FP of (DTMIs) institutions. This indicated that enhancing the efficiency of credit risk management could lead to an improvement in FP, highlighting the critical role of effective credit risk management in shaping the financial outcomes of these institutions.

The study's findings suggested capital adequacy and FP portrayed a weak and non-significant relationship within the studied DTM institutions. The substantial variability in capital adequacy values indicated potential disparities in the sufficiency of capital to cover risk-weighted assets. The limited impact on financial performance implied that capital adequacy might not significantly influence the financial outcomes of these institutions.

As per the research findings, considerable differences in liquidity levels across DTM institutions didn't translate into better FP. The study's analyses revealed liquidity levels and financial performance showcased a non-significant negative relationship, indicating that higher liquidity might not ensure improved financial performance within these institutions.

The assessment of interest rate spread's impact on FP among (DTMIs) showcased a substantial positive correlation with financial performance. The subsequent regression analysis affirmed a robust positive coefficient, suggesting that changes in the interest rate spread significantly influenced the FP of these institutions.

5.3 Recommendations

The study recommended that Policymakers should focus on implementing robust credit risk management policies that enhance risk assessment and mitigation strategies. Establishing standardized guidelines and frameworks for credit risk evaluation and control could help minimize non-performing loans (NPLs), ultimately contributing to improved financial outcomes in these institutions. Policymakers should aim to ensure a consistent regulatory framework that mandates a minimum level of capital to cover risk-weighted assets. However, since the findings suggested potential disparities in capital sufficiency among institutions, regulations should be flexible enough to consider the variations in the nature and scale of operations in these institutions while still ensuring stability.

Policymakers should establish guidelines that encourage a balanced approach to liquidity management. This may involve ensuring that these institutions have access to sufficient liquidity to meet their obligations without over-prioritizing liquidity at the expense of optimizing financial performance. Policymakers should consider instituting regulatory measures that encourage responsible management of interest rate spread in Deposit-Taking Microfinance Institutions (DTMIs). It's crucial to ensure ethical and transparent practices in setting interest rates. The policies should aim to strike a balance between enabling institutions to generate income through interest rate spreads and safeguarding borrowers' interests, promoting fair lending practices.

For variables like credit risk management and interest rate spread that exhibited significant relationships with financial performance, practical strategies should focus on enhancing these areas. Developing comprehensive and strategic plans to improve credit risk assessment, management practices, and interest rate spread should be a priority to directly impact financial performance positively. DTMIs should focus on maintaining a keen understanding of interest

rate spread dynamics. They should adopt strategic pricing methodologies that optimize interest rate spreads without undermining borrower trust. Implementation of prudent financial practices to ensure that changes in interest rate spreads positively influence the financial performance of these institutions should be a priority. Furthermore, regular monitoring and reviews of interest rates can help institutions adapt their practices to the ever-evolving financial landscape while remaining aligned with regulatory guidelines and borrower expectations.

While capital adequacy and liquidity ratios did not demonstrate a significant relationship with financial performance, operational practices should continue to focus on maintaining prudent levels. Despite not significantly affecting financial performance, it's essential to maintain sufficient capital and liquidity levels to ensure the stability and operations of these institutions in varying economic conditions. Strengthening risk management practices, even if these areas do not have a direct significant impact on FP, remains crucial for the overall stability and reliability of the microfinance institutions.

5.4 Limitations of the Study

One notable limitation of this study lies in its reliance on secondary data for analysis. While secondary data can provide valuable insights from existing sources, it inherently carries limitations related to data quality and availability. The study's findings are contingent upon the accuracy, completeness, and consistency of the collected data, which may be subject to errors or discrepancies originating from the original data sources. Furthermore, the scope and granularity of the collected data might not perfectly align with the study's specific research questions, potentially leading to an incomplete understanding of the underlying relationships. This limitation underscores the importance of cautious interpretation and the potential for hidden biases that can influence the outcomes.

Another limitation stems from the variation in the explanatory power of the regression model. The model's ability to explain only around 27.3 of the variance in FP suggests that a significant proportion of the variability remains unaccounted for. This could be attributed to unobserved variables or external factors not included in the analysis. The study's findings might thus be influenced by omitted variable bias, potentially leading to misleading conclusions or an incomplete understanding of the factors shaping financial performance. Future research could consider exploring additional variables or adopting more complex modelling techniques to capture a more comprehensive range of influences.

Focusing exclusively on central bank-licensed deposit-taking microfinance institutions (DTMIs) constrains the study's generalizability to a specific subset of microfinance entities. The findings may not necessarily apply to other types of microfinance institutions or non-regulated microfinance entities, which might operate under distinct conditions and regulations. This limitation restricts the study's ability to offer comprehensive insights into the broader microfinance landscape. To attain a more holistic understanding of independent variable and FP relationship, future research could expand its scope to encompass various types of microfinance institutions and incorporate a wider range of industry players.

5.5 Areas of Further Research

To enhance the generalizability of the findings, future research could broaden the scope beyond central bank-licensed DTMIs to encompass a wider array of microfinance institutions operating under varying regulatory frameworks. This would provide a more in-depth understanding of the relationships between the studied variables and FP across different microfinance contexts. By including non-regulated microfinance entities and microfinance cooperatives, researchers could capture a more diverse range of practices, regulatory environments, and economic

conditions, allowing for a more robust exploration of the factors influencing financial performance.

Addressing the limitations associated with secondary data, future research could opt for primary data collection methods. Conducting surveys, interviews, or case studies with microfinance institutions would allow researchers to gather data tailored to the specific research questions, potentially minimizing issues of data quality and accuracy. Primary data collection offers the advantage of obtaining context-rich information, enabling a deeper understanding of the variables and their interplay. Furthermore, using primary data collection methods could facilitate the exploration of additional variables that might not be available in secondary datasets, thereby enhancing the complexity and completeness of the analytical model.

To amplify the explanatory power of the regression model, future studies could consider incorporating a more extensive set of variables. By including a broader array of financial, operational, and contextual variables, researchers could capture a wider spectrum of influences on financial performance. Variables like governance structure, market penetration, and regulatory compliance could be integrated to enrich the analytical model and provide a more holistic perspective on microfinance institutions' financial outcomes. A comprehensive set of variables would contribute to a more accurate depiction of the intricate relationships underpinning financial performance.

Another avenue for further research involves conducting comparative analyses across different regions or countries. Exploring how the independent variables and FP relationship vary across diverse economic and cultural contexts would yield valuable insights. This could shed light on whether certain variables exhibit consistent impacts across regions or if the relationships are context-specific. By comparing findings from various geographical areas, researchers could

identify common patterns, divergent trends, and potential regional nuances that contribute to a deeper understanding of the dynamics at play.

REFERENCES

Abdullah, A., Ramli, R., Nordin, N., & Haron, H. (2020). The impact of credit risk management on the financial performance of microfinance institutions. *Journal of Economics, Business and Management,* 8(11), 679-686.

Adekunle, O., Alalade, S. Y., Agbatogun, T., & Abimbola, C. (2015). Credit risk management and financial performance of selected commercial banks in Nigeria. *Journal of Economic & Financial Studies, 3*(01), 01-09.

Adi, K., & Arokiasamy, M. (2017). Non-performing loans in Indian banking: An empirical study. *International Journal of Economics and Financial Issues*, 7(2), 139-149.

Adrian, T., & Brunnermeier, M. (2011). Covar. *American Economic Review, 101*(3), 111-116.

Altman, E. I., & Saunders, A. (1997). Credit risk measurement: Developments over the last 20 years. *Journal of banking & finance, 21*(11-12), 1721-1742.

Argüello, N., Delalex, I., Limvorasak, S., Pettibone, V., & Sun 1, S. (2013). Pricing transparency and performance in the microfinance industry: Truth-in-lending, profitability, scale, and funding. *Journal of Innovation Economics, (1),* 173-204.

Avery, R. B., Bostic, R. W., Calem, P. S., & Canner, G. B. (1996). Credit risk, credit scoring, and the performance of home mortgages. *Fed. Res. Bull., 82*, 621.

Banerjee, J., Harnoor, D., & Jayalakshmi, B. (2017). Financial performance of microfinance institutions in India: An empirical analysis. *International Journal of Applied Business and Economic Research*, 16(3), 837-846.

Basel (1999), Principles for the management of credit risk", Consultative paper issued by the Basel Committee on Banking Supervision, Basel, (April 2010).

Basel Committee on Banking Supervision (BCBS). (2006). International Convergence of Capital Measurement and Capital Standards: A Revised Framework.

Beck, T., Demirgüç-Kunt, A., & Pería, M. S. M. (2009). Microfinance meets the market. The World Bank Research Observer, 24(1), 45-71.

Bengi, R. M., & Njenje, D. (2016). Assessment of the influence of financial factors on the growth of microfinance institutions in Bahati Sub-County, Kenya. International Journal of Economics, Commerce and Management, 4(3), 415-437.

Black, F. (1972). Capital market equilibrium with restricted borrowing. *Journal of Business*, 45(3), 444-455.

Brown, K., & Moles, P. (2014). Credit risk management. *K. Brown & P. Moles, Credit Risk Management*, *16*.

Bryner, R. (2018). Understanding Financial Performance. In Wiley Finance (pp. 1-8). John Wiley & Sons, Ltd.*Journal of Financial Economics*, 116(1), 1-22.

Central Bank of Kenya. (2022). Microfinance Institutions Contribution to Kenya's GDP. Nairobi: Central Bank of Kenya.

Chang, L. (2021). The Impact of Credit Risk Management on the Financial Performance of Microfinance Institutions in Asia. *Asia Pacific Journal of Management and Economics,* 34(2), 121-142.

Chen, J., & Feunou, B. (2018). Criticisms of credit risk models: An empirical investigation. *Journal of Financial Management*, 20(4), 57-66.

Chen, J., & Yao, D. (2017). The impact of credit risk management on financial performance in commercial banks: Evidence from the Chinese banking industry. *International Journal of Economics, Commerce and Management*, 5(6), 1-16.

Chiarello, T. C., Pletsch, C. S., da Silva, A., & da Silva, T. P. (2014). Financial performance, intangible assets and value creation in Brazilian and Chilean information technology companies. *Revista galega de economía: Publicación Interdisciplinar da Facultade de Ciencias Económicas e Empresariais*, *23*(4), 73-88.

Daher, L., & Le Saout, E. (2013). Microfinance and financial performance. *Strategic Change*, *22*(1-2), 31-45.

Daoud, J. I. (2017). Multicollinearity and regression analysis. In *Journal of Physics: Conference Series* (Vol. 949, No. 1, p. 012009). IOP Publishing.

Duca, J. V., & McLaughlin, M. M. (1990). Developments affecting the profitability of commercial banks. *Fed. Res. Bull.*, *76*, 477.

Dulock, H. L. (1993). Research design: Descriptive research. *Journal of Pediatric Oncology Nursing*, *10*(4), 154-157.

Durbin, J., & Watson, G. S. (1992). *Testing for serial correlation in least squares regression. II* (pp. 260-266). Springer New York.

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model.

Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26(2), 301-325.

Farooq, M., Wang, Q., & Zhang, Q. (2019). The relationship between credit risk management and financial performance in commercial banks: Evidence from developing countries. *International Journal of Economics, Commerce and Management*, 7(5), 1-15.

Fatihudin, D. (2018). How measuring financial performance. *International Journal of Civil Engineering and Technology (IJCIET)*, *9*(6), 553-557.

Gatuhu, R. N. (2013). The effect of credit management on the financial performance of microfinance institutions in Kenya. *Unpublished doctoral dissertation*, University of Nairobi.

Gonzalez-Vega, C., Martinez-Pimienta, N. A., & Serrano-Cinca, C. (2016). Financial literacy, financial inclusion and microfinance in developing countries: An empirical analysis. *International Journal of Economics, Commerce and Management*, 4(12), 1-11.

Gregory, J. (2010). *Counterparty credit risk: the new challenge for global financial markets* (Vol. 470). John Wiley & Sons.

Hansen, B. (1999). Testing for linearity. *Journal of economic surveys*, *13*(5), 551-576.

Hardy, D., Holden, P., & Prokopenko, V. (2002). Microfinance institutions and public policy.

Harelimana, J. B. (2017). Effect of debt financing on business performance: A comparative study between I&M Bank and Bank of Kigali, Rwanda. *Global Journal of Management and Business Research*, 17(2), 37-45.

Ibtissem, B., & Bouri, A. (2013). Credit risk management in microfinance: The conceptual framework. *ACRN Journal of Finance and Risk Perspectives*, *2*(1), 9-24.

International Organization of Securities Commissions (IOSCO). (2017). Principles for the Management of Credit Risk.

Iyengar, R., & Mittoo, U. (2016). The limitations of credit risk models in emerging markets. *Journal of Emerging Markets Finance*, 15(3), 243-255.

Jarrow, R., & Turnbull, S. (1995). Pricing options on financial securities subject to credit risk. *Journal of Finance*, 50(1), 53-86.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.

Khumalo, D. (2011). Microfinance in South Africa: Exploring the impact of microfinance institutions on the well-being of their clients. *Journal of African Business*, 12(2), 125-137.

Kiarie, W. W. (2017). Microfinance institutions in Kenya: a mission drift or progression?.

Korir, S. (2014). The effect of credit risk management on financial performance of deposit taking microfinance institutions in Kenya. *Unpublished doctoral dissertation*, University of Nairobi.

Kodongo, O., & Kendi, L. G. (2013). Individual lending versus group lending: An evaluation with Kenya's microfinance data. *Review of Development Finance*, *3*(2), 99-108.

Koulafetis, P. (2017). *Modern Credit Risk Management*. Palgrave Macmillan.

Kulick, P. (1997). An analysis of credit risk models. *Journal of Financial Economics*, 46(3), 411-458.

Ledgerwood, J., Earne, J., & Nelson, C. (Eds.). (2013). *The new microfinance handbook: A financial market system perspective*. World Bank Publications.

Lelgo, K. J., & Obwogi, J. (2018). Effect of financial risk on financial performance of micro finance institutions in Kenya. *International Academic Journal of Economics and Finance*, *3*(2), 357-369.

Markowitz, H. (1952). Portfolio selection. *The Journal of Finance, 7*(1), 77-91.

Mersland, R., & Strøm, R. (2009). The relationship between credit risk and financial performance in microfinance institutions. *Journal of Banking & Finance*, 33(11), 1886-1894.

Mohanty, R., & Samantray, A. K. (2018). Liquidity management in microfinance institutions: An empirical study in India. *International Journal of Economics, Commerce and Management*, 6(2), 1-8.

Molapo, M. (2020). The impact of credit risk management on the financial performance of microfinance institutions. *Unpublished doctoral dissertation*, University of South Africa.

Musyoki, D., & Kadubo, A. S. (2012). The impact of credit risk management on the financial performance of banks in Kenya for the period. *International Journal of Business and Public Management*, *2*(2), 72-80.

Mwangi, M. N. (2014). *The effects of liquidity on financial performance of deposit taking micro finance institutions in Kenya* (Doctoral dissertation).

Ngumi, S. M. (2014). The effect of lending interest rates on financial performance of deposit taking micro finance institutions in Kenya (Doctoral dissertation, University of Nairobi).

Njanike, K. (2009). The impact of effective credit risk management on bank survival. *Annals of the University of Petroşani, Economics*, *9*(2), 173-184.

Ogindo, R. O. (2006). An assessment of performance of micro-finance institutions (MFIs) in Kenya (*Unpublished Doctoral dissertation)*.

Orichom, G., & Omeke, M. (2021). Capital structure, credit risk management and financial performance of microfinance institutions in Uganda. *Journal of Economics and International finance*, *13*(1), 24-31.

Paul, S., & 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.

Shapiro, S. S., & Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika*, *52*(3/4), 591-611.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19(3), 425-442.

Shiller, R. J. (2000). *Irrational exuberance*. Princeton University Press.

Song'e, H. K. (2015). The effect of liquidity management on the financial performance of deposit taking Saccos in Nairobi County.

Stulz, R. M. (2008). 5. Rethinking Risk Management. In *Corporate Risk Management* (pp. 87-120). Columbia University Press.

Tucker, M., & Miles, G. (2004). Financial performance of microfinance institutions: a comparison to performance of regional commercial banks by geographic regions. *Journal of Microfinance/ESR Review*, *6*(1), 4.

Vargas-Hernández, J. (2017). Financial inclusion and microfinance institutions: A review of literature. *International Journal of Economics and Financial Issues*, 7(1), 20-26.

Wang, Z., Cai, L., & Zhang, X. (2020). The relationship between credit risk management and financial performance of microfinance institutions: Evidence from China. *Journal of Financial Management*, 23(2), 68-76.

Weber, O. (2012). Environmental credit risk management in banks and financial service institutions. *Business Strategy and the Environment*, *21*(4), 248-263.

Wild, J. J., Shaw, W. H., & Chiappetta, B. (2017). *Financial and Managerial Accounting*. Cengage Learning.

Williamson, O. E. (1985). *The economic institutions of capitalism*. New York, NY: Free Press.

Wilson, T. C. (1998). Portfolio credit risk. *Economic policy review*, *4*(3).

APPENDICES

Appendix I: Data used in the Analysis

DTMFI	Year	Profit Before Tax	Total Asset	y= Financial Performance	Total NPL	Total Loan	X1 = Total NPL/ Total Loan	X2 = Capital Adequacy Ratio (%)	X3 = Liquidity Ratio	Interest Rate on Loan	Interest Rate on Deposit	X4 = Interest on loan - Interest on Deposit
Kenya Women Microfinance Bank Limited	2015	558	31861	1.75	1745	22094	7.90	23	28	18.90	2.96	15.94
	2016	324	32153	1.01	3150	22189	14.20	23	28	19.37	2.72	16.65
	2017	37	28931	0.13	3,269	19,374	16.87	24	29	21.16	3.39	17.77
	2018	-1044	29582	-3.53	3453	19997	17.27	18	21	17.07	2.68	14.39
	2019	-525	30613	-1.71	3194	18972	16.84	21	24	16.06	2.23	13.82
	2020	-1507	28038	-5.37	3751	16741	22.41	16	20	14.55	3.06	11.49
	2021	131	26961	0.49	3641	15129	24.07	1	26	15.93	3.59	12.33
	2022	-75	27329	-0.27	3664	15810	23.18	14	20	14.76	4.34	10.42
Faulu Microfinance Bank Limited	2015	183	25324	0.72	254	16584	1.53	21	31	12.74	5.48	7.27
	2016	98	27369	0.36	1025	17955	5.71	20	30	13.71	6.43	7.28
	2017	222	25324	0.88	2,257	16,958	13.31	20	26	14.08	1.97	12.11
	2018	274	27225	1.01	57	16935	0.34	16	27	13.12	5.98	7.14
	2019	456	29682	1.54	163	19777	0.82	13	26	14.62	5.88	8.75
	2020	-476	29279	-1.63	358	17561	2.04	9	29	13.48	6.37	7.11
	2021	-522	27780	-1.88	77	15378	0.50	2	34	13.13	6.66	6.48
	2022	-14	22704	-0.06	212	12975	1.63	18	30	13.24	6.23	7.01
Rafiki Microfinance Bank Limited	2015	46	7729	0.60	346	4270	8.10	21	53	11.31	2.99	8.32
	2016	-461	7327	-6.29	668	3661	18.25	17	12	12.58	4.49	8.09
	2017	-452	6727	-6.72	738	2,856	25.84	11	19	9.68	1.58	8.10
	2018	-274	6050	-4.53	697	2723	25.60	17	21	10.10	2.73	7.37
	2019	-4	5935	-0.07	857	3040	28.19	16	39	9.35	2.91	6.44
	2020	-60	6005	-1.00	1132	4095	27.64	12	31	10.32	2.85	7.48
	2021	-153	5889	-2.60	1460	3484	41.91	6	40	10.95	3.07	7.88
	2022	-314	5346	-5.87	1474	3473	42.44	10	28	11.17	3.59	7.58
SMEP Microfinance Bank Limited	2015	-4	2592	-0.15	36	1728	2.08	5	24	18.44	1.50	16.94
	2016	-146	2659	-5.49	158	1677	9.42	3	30	15.80	2.86	12.94
	2017	-120	2734	-4.39	91	1,677	5.43	13	23	15.73	2.45	13.28
	2018	-16	2942	-0.54	32	1647	1.94	18	30	17.06	3.23	13.83
	2019	19	3314	0.57	13	1682	0.77	15	27	19.70	4.98	14.73
	2020	-98	3382	-2.90	3	1761	0.17	6	23	14.04	3.55	10.50
	2021	-58	3466	-1.67	10	1500	0.67	-6	24	14.25	3.87	10.39
	2022	3	3219	0.09	62	1412	4.39	7	25	14.82	2.67	12.15
Sumac Microfinance Bank Limited	2015	13	608	2.14	56	433	12.93	36	40	19.74	4.93	14.80
	2016	18	803	2.24	7	538	1.30	33	29	23.29	3.74	19.55
	2017	10	1137	0.88	26	623	4.17	27	60	18.82	4.75	14.07
	2018	16	1530	1.05	290	919	31.56	23	33	18.30	2.42	15.88
	2019	18	2013	0.89	122	1199	10.18	19	3	16.44	3.43	13.02

	2020	11	2310	0.48	330	1314	25.11	18	37	15.50	4.37	11.13
	2021	17	3037	0.56	359	1348	26.63	6	41	12.68	4.48	8.20
	2022	7	3678	0.19	405	1,540	26.30	16	49	9.46	4.16	5.30
REMU/LOC Microfinance Bank Limited/KEY	2015	-21	397	-5.29	44	257	17.12	59	40	12.85	3.53	9.32
	2016	-17	362	-4.70	46	244	18.85	58	36	16.85	3.04	13.81
	2017	-25	354	-7.06	43	218	19.72	47	54	14.41	2.26	12.15
	2018	-42	433	-9.70	48	231	20.78	33	75	12.01	1.85	10.16
	2019	-34	406	-8.37	51	158	32.28	31	100	12.07	1.97	10.10
	2020	-34	354	-9.60	33	98	33.67	13	31	7.34	1.69	5.65
	2021	-51	406	-12.56	41	62	66.13	-19	27	3.45	1.48	1.97
	2022	-48	451	-10.64	41	168	24.40	33	30	3.77	2.00	1.77
Caritas Microfinance Bank Limited	2015	-60	186	-32.26	0	11	0.00	118	67	0.00	0.54	-0.54
	2016	-74	574	-12.89	0	141	0.00	94	47	1.22	1.57	-0.35
	2017	-71	879	-8.08	17	351	4.84	52	30	3.87	0.11	3.75
	2018	-85	1244	-6.83	25	751	3.33	28	37	7.48	2.17	5.31
	2019	-51	1712	-2.98	77	758	10.16	22	54	7.65	2.80	4.85
	2020	5	2284	0.22	43	1411	3.05	15	35	7.53	2.85	4.68
	2021	17	2951	0.58	65	1952	3.33	4	32	10.30	3.25	7.05
	2022	32	2270	1.41	112	2154	5.20	16	34	15.29	5.33	9.96
Branch Microfinance Bank Limited/ Century Microfinance	2015	-58	197	-29.44	1	79	1.27	28	28	13.20	4.06	9.14
	2016	-41	225	-18.22	12	107	11.21	14	9	16.00	4.44	11.56
	2017	-63	288	-21.88	17	103	16.50	-15	269	8.33	0.00	8.33
	2018	-25	431	-5.80	13	195	6.67	20	45	11.83	6.73	5.10
	2019	-43	348	-12.36	27	187	14.44	8	20	16.09	10.06	6.03
	2020	-60	296	-20.27	18	114	15.79	-17	23	13.18	9.12	4.05
	2021	-8	431	-1.86	28	113	24.78	-28	42	7.66	6.73	0.93
	2022	-20	288	-6.94	135	342	39.47	36	97	69.44	2.08	67.36
U & I Microfinance Bank Limited	2015	9	142	6.34	5	142	3.52	79	28	21.83	1.41	20.42
	2016	12	77	15.58	7	271	2.58	58	27	68.83	14.29	54.55
	2017	16	122	13.11	22	325	6.77	50	21	62.30	4.92	57.38
	2018	13	136	9.56	38	443	8.58	47	21	62.50	16.18	46.32
	2019	8	184	4.35	19	602	3.16	36	31	51.63	14.67	36.96
	2020	18	351	5.13	15	700	2.14	35	22	30.20	9.69	20.51
	2021	36	406	8.87	6	872	0.69	21	27	35.96	9.11	26.85
	2022	27	534	5.06	6	1077	0.56	35	67	32.40	8.24	24.16
Salaam Microfinance Bank Limited/ UWEZO Microfinance Bank	2015	2	226	0.88	27	97	27.84	125	217	17.70	1.77	15.93
	2016	3	214	1.40	50	151	33.11	84	49	18.69	6.07	12.62
	2017	-12	212	-5.66	79	126	62.70	91	108	11.79	11.79	0.00

	2018	-31	225	-13.78	76	135	56.30	69	106	11.11	0.44	10.67
	2019	-71	168	-42.26	34	68	50.00	69	74	16.07	5.36	10.71
	2020	-230	180	-127.78	30	39	76.92	65	95	5.56	3.89	1.67
	2021	-40	120	-33.33	10	28	35.71	266	720	0.83	1.67	-0.83
	2022	-66	83	-79.52	18	45	40.00	128	363	13.25	2.41	10.84
Choice Microfinance Bank Limited	2015	-40	77	-51.95	0	19	0.00	76	69	1.30	1.30	0.00
	2016	-50	122	-40.98	3	35	8.57	42	33	5.74	1.64	4.10
	2017	-54	351	-15.38	0	31	0.00	-7	10	3.70	0.28	3.42
	2018	-59	406	-14.53	0	22	0.00	-46	3	2.71	1.97	0.74
	2019	-29	534	-5.43	1	11	9.09	6	2	1.12	1.12	0.00
	2020	-26	686	-3.79	3	6	50.00	-120	1	0.87	0.87	0.00
	2021	-24	805	-2.98	4	7	57.14	-145	29	0.12	0.75	-0.62
	2022	-12	1006	-1.19	4	9	44.44	40	207	0.10	0.20	-0.10
Daraja Microfinance Bank Limited	2015	-35	83	-42.17	5	36	13.89	106	44	2.41	3.61	-1.20
	2016	-45	180	-25.00	8	51	15.69	82	70	5.56	2.22	3.33
	2017	-60	168	-35.71	5	53	9.43	7	24	7.74	0.00	7.74
	2018	-44	172	-25.58	8	48	16.67	-17	21	9.88	7.56	2.33
	2019	-46	133	-34.59	10	42	23.81	144	8	8.27	6.77	1.50
	2020	-40	124	-32.26	2	25	8.00	-254	6	2.42	7.26	-4.84
	2021	-30	120	-25.00	1	22	4.55	-332	4	1.67	6.67	-5.00
	2022	-21	235	-8.94	4	28	14.29	-8	3	2.13	3.40	-1.28