

**FINANCIAL RISKS, FINANCIAL REGULATION AND FINANCIAL
PERFORMANCE OF DEPOSIT TAKING MICROFINANCE INSTITUTIONS
IN KENYA**

BY

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DECLARATION

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This research thesis is my original work and has not been presented for examination in any other university:

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DEDICATION

This work is dedicated to my family and friends for their support and inspiration during the period of study.

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I thank God for taking me this far. The completion of this research thesis would have not been possible without the support of several people. I wish to acknowledge my supervisors Dr. Robert Odunga and Dr. Joel Chepkwony for their support and guidance during the entire thesis writing. They have also been influential in ensuring that this scholarly work has achieved its set objectives in the field of knowledge. I appreciate my family for the input and accommodating me when I worked late. I wish to thank also my classmates in Moi University for the assistance offered to me during this process of writing this research thesis. Special thanks also go to my friends and colleagues who continue to inspire and encourage me positively. Their support energized and moulded my skills in the approaches to the research field. Above all to the almighty God for his protection and provision of financial, moral and social support throughout my master's programme at Moi University.

ABSTRACT

Despite increasing competitiveness and volatility within the financial sector there has been inconclusive evidence on the effect of financial risk on financial performance among deposit taking microfinance institutions. This study determined how financial risk; liquidity risks, credit risks, foreign exchange risk and interest rate risk affect the financial performance of deposit taking microfinance institutions. The moderating effect of financial regulation on the relationship between financial risks management strategies and the performance of deposit taking microfinance institutions was also determined in this study. The theories that guided the study included the shiftability, stakeholder, risk management, new theory of financial regulation and micro prudential regulation. Explanatory research design was employed in this study targeting 13-regulated deposit taking microfinance institutions in Kenya for the period 2010-2018. Secondary data collected from financial reports were analyzed using descriptive and inferential statistics. Pearson correlation results showed that liquidity risk and interest rate risk have a positive and significant association with financial performance of microfinance institutions while credit risk and foreign exchange risk have a negative and significant association with financial performance of microfinance institutions. Regression analysis indicated that liquidity risks ($\beta = 0.336584$, $p = 0.000 < 0.05$) and interest rate risk ($\beta = 0.558724$, $p = 0.049 < 0.05$) have a positive significant relationship with financial performance of microfinance institutions. There was a negative and significant relationship between credit risk and performance of micro financial institutions ($\beta = -0.01059$, $p = 0.023 < 0.05$). A negative and significant relationship between foreign exchange risk and performance of micro financial institutions ($\beta = -0.78296$, $p = 0.004 < 0.05$) was also revealed. Financial regulations moderate financial risks and financial performance of microfinance institutions in Kenya since R^2 improved from 48.83% before moderation to 53.87% after moderation. Based on research finding it can be concluded that liquidity risk, credit risk, foreign exchange risk and interest rate risk affects financial performance of Microfinance Institutions. It was also concluded that financial regulations is a significant moderator. The study gives recommendations that MFIs should manage liquidity risk by reinforcing its own resources since depositors could at any time and under unexpected reasons, withdraw their deposits to seek investment elsewhere with higher returns. The study recommends that MFIs should enhance credit risk management practices which include portfolio asset management, MFIs loan policy procedure, risk monitoring, risk analysis and assessment, credit scoring mechanism. The study recommends that MFIs should explore avenues to enhance capacities within them for managing foreign exchange risk. The study also recommends that firms should look at instituting a sound risk management system and also needs to formulate their hedging strategy that suits their specific firm characteristics and exposures. MFIs should set their interest rates within the ranges that are set by the Central bank of Kenya.

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OPERATIONAL DEFINITION OF TERMS

- Credit Risk -** It is the risk of default on a debt that may arise from a borrower failing to make required payments (Coyle, 2010)
- Financial Performance -** Is the measure of organizations achievement on the goals, policies and operations stipulated in monetary terms. It involves the financial health and can be compared between similar firms in the same industry (Tilahun & Dereje, 2012)
- Financial Risk -** Financial risk is often defined as the unexpected variability or volatility of returns and thus includes credit risks, liquidity risks and market risks. This risk concerns the continuous financial position of an enterprise (Holton, 2004).
- Foreign Exchange Risk -** Relates to the effect of an expected exchange rate changes on the value of the firm (Boermans, 2011).
- Interest Rate Risk -** The volatility of lending rates in the commercial banking sector (Simba 2010)
- Liquidity Risk -** Liquidity risk is the potential for loss to an institution arising from the failure of the organization to meet its financial obligations (Ismail, 2010).
- Microfinance -** The provisions of financial services to the low-income households and micro and small enterprise provide an enormous potential to support the economic activities of the poor and thus contribute to poverty alleviation (Marconatto, Cruz, & Pedrozo, 2016).

Return on Asset - is an important financial performance ratio it measures the efficiency with which the company is managing its investment in assets and using them to generate profit (Bhunja, Mukhuti & Gautam, 2011)

ABBREVIATIONS AND ACRONYMS

ANOVA-	Analysis of Variance
CBK-	Central Bank of Kenya
DTMFI-	Deposit Taking Microfinance Institutions
DW -	Durbin Watson
NACOSTI-	National Commission for science Technology & Innovation
MFI-	Micro Finance Institutions
ROA-	Return on Assets
ROCE-	Return on Capital Employed
ROE-	Return on Equity
VAR-	Value at Risk
VIF-	Variance Inflation factors

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter focuses on the introduction to the research. The chapter specifically presented the background to the study, the statement of the problem, the objectives of the study, the research questions and significance of the study as well as the scope of the study.

1.1 Background to the Study

Microfinance Institutions commonly known as MFIs are financial organizations tailored to meet the needs of low-income earners (Marconatto, Cruz, & Pedrozo, 2016). Low income earners have little or no access to conventional banking products (Bakker, Schaveling, & Nijhof, 2014). MFIs are not limited to financial intermediation but may also provide social intermediation through the provision of services such as: financial literacy programs, group formation and managerial capabilities. Among all financial products provided by MFIs, microcredit predominates (Rosenberg, Gaul, Ford, & Tomilova, 2013).

Over the years, MFIs have revolutionized and are providing a wide range of financial services that are affordable and of high quality to everyone and especially low-income earners. The array of financial products provided includes but is not limited to: credit facilities, savings, insurance and funds transfer. MFIs may also provide financial intermediation by providing services such as: collateral substitutes these could be in the form of group guarantees or compulsory savings, access to repeat and larger loans but may also provide social intermediation through the provision of services such as: group

formation, financial literacy programs and managerial capabilities (Van Rooyen, Stewart, & De Wet, 2012).

Over the last two decades, great focus has been on financial performance in numerous banks in Africa. Many bank managers are looking for means of improving performance by undertaking a primary transformation of banking business (Olweny & Shipho, 2011). Thus, stiff competition has emerged forcing banks to implement expansion strategies. Africa's banking has introduced new forms of lending with improved technology aimed at increasing performance, however these changes threaten African banking sector as the banks have to prepare complicated balance sheets which have greater risks in assets and liabilities. New lending techniques to small and medium enterprise with a target of improving performance has led to default hence credit risk, this constitutes large portion of loans in Africa. Introduction of microfinance and Internet banking in African banking sector has been risky, as majority of customers are poor or not familiar with Internet services (Ongore & Kusa, 2013).

The main aim of every micro-finance institution is to have operations that are profitable in order to maintain stability and improve on sustainability and growth (Agola, 2014). Thus, Microfinance Institutions (MFIs) should seek to maximize performance in many areas, whether it is social or economic (Jørgensen, 2011). Financial performance can be measured through various financial measures such as profit after tax, return on assets (ROA), return on equity (ROE), earnings per share and any market value ratio that is generally accepted (Yenesew, 2014). The return on assets ratio (ROA) is an important financial performance ratio because it measures the return on assets. As defined by Gibson (2012), financial performance may be referred to as the extent to which financial goals and objectives of a financial institution have been accomplished or are

being attained. It is a process of matching up the revenue generated to the institution 'set policies. It is a key measure for assessing the financial health of a particular organization within the set time. Credit risk is the likelihood of counterparty defaulting on his or her obligations is referred to as default risk. This brings about deterioration of the credit quality deteriorates or else there is an increase in default risk. As stated by Gregory (2010), it is difficult to evaluate the extent of credit risk since information on non-payment and resurgence rates are not wide-ranging. As illustrated by Otieno and Nyagol (2016), the microfinance industry is on the rise and gaining significance in the global financial sector.

Financial regulations are the laws that have been put in place by the state to govern financial institutions, Agborndakaw (2010). The Financial Times (n.d.) have a similar definition and describe regulations as laws that govern the activities of all financial 3 institutions. Agborndakaw (2010) says that these regulations aim at maintaining orderly markets, licensing the providers of financial services, enforcing applicable laws as well as prosecuting cases of market misconduct, protecting clients and investors and promoting the stability of the financial system. These regulations are promulgated by government regulators as well as international groups. The government regulator in Kenya is the CBK.

1.1.1 Global perspective of Deposit Taking Microfinance Institution

The microfinance industry has changed over the past three decades. It came to prominence in the 1980s, although subsidized credit programs to targeted communities date back to the 1950s and early experiments in Bangladesh, Brazil and a few other countries began in the 1970s (Muriithi 2012). According to survey of major financial

firms in United States of America (USA) showed that at least 90% are using some form of financial engineering to manage financial risk (Muriithi, 2012).

The concerns about financial risk in financial institution have been increasing worldwide. In this environment, financial institution globally are looking to develop robust financial risk management frameworks that satisfy compliance demands, contribute to better decision making, and enhance performance (Muriithi 2012). Mudge (2000) state that a consistent framework for evaluating firm wide risk and return across diverse financial activities. Banks and other intermediaries can transfer the payment delays and the credit risk among producers, or between producers and outside investors (Demirguc-kunt &Huzinga, 2000).

1.1.2 Regional perspective of Deposit Taking Microfinance Institution

Regionally in west Africa for instance in Nigeria, the emergence and explosion of MFIs has facilitated the financial access. However, financial systems in Nigeria are underdeveloped because of weak adherence to corporate governance practices (Ibadin, & Dabor, 2015). According to Umoren (2010) MFIs act as an important agent in credit provision and providing other related banking services when there's limited access to formal financial institutions. However, the rapid failure of Microfinance banks (MFBs) in Nigeria in 2010 led to the withdrawal by central bank of Nigeria of 103 micro finance banks licences. The massive closure of these institutions has cast doubt on the ability of MFBs in Nigeria to be financially sustainable (Adeyemi & Fagbemi, 2010).

1.1.3 Local perspective of Deposit Taking Microfinance Institution

The microfinance industry in Kenya is under the umbrella of Association of Microfinance Institutions of Kenya (AMFI) Kenya. The institution was registered in 1999 under the societies Act and the main objective of AMFI is provision of general

policy guidelines, adherence to ethical practices and direction to the association (Aduda and Kalunda, 2012). The AMFI categorizes microfinance institutions into two categories namely; Deposit Taking Microfinance and Non Deposit Taking MFIs.

According to Ali (2005) the earliest forms of microfinance and microcredit in Kenya were church-based lending programs that arose in the 1980s. Those institutions were confined to specific church parishes that begun with local financing for members before they established into other in the rural and suburban areas of Kenya. Micro finance Institutions in Kenya have been in existence since late 1990s and were fully regulated. According to CBK (2016) Legislation pertaining the micro finance was passed in 2006 followed by the micro finance act which became operational in 2008. Microfinance institution can be classified into deposit taking and non-deposit taking microfinance and provides for banks to establish fully owned subsidiary to undertake deposit taking microfinance business (Afude,2017).

1.2 Statement of the Problem

The global financial crisis between mid-2007 and early 2009 revealed the importance of MFIs regulations to hedge against high risks attributed to imbalances in MFIs (Lelgo and Obwogi 2018). There are five ways in which financial risk management systems can break down, all exemplified in the global crisis and other recent ones: failure to use appropriate risk metrics; miss-measurement of known risks; failure to take known risks into account; failure in communicating risks to top management; failure in monitoring and managing risks.

Deposit taking business encompasses a potential risk of loss depending on how the clients' deposits are employed. There are various techniques and risks associated with deposit taking that would justify external regulation and supervision. These include

physical security of deposits, insurance of deposits and adequate liquidity. The depositors should be able to access and withdraw without subjecting the institution to solvency risks and attainment of financial performance. According to the Central Bank Supervision Report ,(2015) indicates that many MFIs that collapsed in Kenya in the late 2010's was as a result of the poor management of credit risks which was portrayed in the high levels of non-performing loans.

According to BCBS (2015) banking institutions should consider relationship between various risks and should identify measure, monitor and control risk with the aim of maintaining adequate capital against risks and compensate for risks incurred. Thus, minimum capital is required to absorb losses in continued operations; however, in the recent financial crisis the losses experienced by banks exceeded a minimum capital requirement which was attributed to financial risk (BCBS, 2009, 2010). This led to Basel committee to revise the regulation coming up with incremental risk capital charge and stressed value at risk with an aim of fostering the performance of banking institutions (CBK, 2015).

In Kenya several studies have researched on the relationship between financial risk and financial performance of banking institutions for a period of five years found credit risk, interest rate risk, foreign exchange risk, and liquidity had a significant negative relationship to performance (Muteti, 2014; Mwangi 2014). Other studies found contradicting results where the relationship was positive and significant (Lukorito, Muturi, Nyang'au & Nyamasege 2014; Tarus, Chekol & Mutwol 2012). However, despite this there has been inconclusive evidence in relation to microfinance financial performance and this portrays a gap in research study. Despite being regulated by the Central Bank of Kenya there has been minimal research interest on how financial risk

affect the financial performance of DTMFI. This lack of adequate empirical evidence has motivated this research study.

Financial regulation is a form of supervision that subjects financial institutions to certain restrictions and requirements (Goodhart, Dimitrios and schubik 2013). Financial institutions are required to follow certain rules and guidelines that ensure integrity is maintained within the financial system. Financial regulations are ensured by government or regulatory authorities. These regulations influence the deposit taking sector for the benefit of the clients. Financial regulation ensures a fair playing ground for all institutions enabling them provide competing services and products that will ensure maximum returns to the firms. Noor and Abdalla (2017) studied the impact of financial risk on firms performance in Kenya. This study focused on the deposit taking micro finance institutions.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of the study examined moderating effect of financial regulation on financial risks and financial performance of deposit taking microfinance institutions in Kenya

1.3.2 Specific Objectives

- i. To examine the effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya
- ii. To examine the effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya
- iii. To examine the effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya

- iv. To examine the effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya
- v. To examine the moderating effect of financial regulation on the relationship between financial risks and financial performance of deposit taking microfinance institutions in Kenya
 - a) To examine the moderating effect of financial regulation on the relationship between liquidity risks and the financial performance of deposit taking microfinance institutions in Kenya
 - b) To examine the moderating effect of financial regulation on the relationship between credit risks and the financial performance of deposit taking microfinance institutions in Kenya
 - c) To examine the moderating effect of financial regulation on the relationship between foreign exchange risks and the financial performance of deposit taking microfinance institutions in Kenya
 - d) To examine the moderating effect of financial regulation on the relationship between interest rate risk and the financial performance of deposit taking microfinance institutions in Kenya.

1.4 Hypotheses

H₀₁ There is no significant effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya

H₀₂ There is no significant effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya.

H₀₃ There is no significant effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya.

H₀₄ There is no significant effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya.

H₀₅ There is no significant moderating effect of financial regulation on the relationship between financial risks and the financial performance of deposit taking microfinance institutions in Kenya.

H₀₅ a) There is no significant moderating effect of financial regulations on the relationship between liquidity risk and the financial performance of deposit taking microfinance institutions in Kenya.

H₀₅ b) There is no significant moderating effect of financial regulations on the relationship between credit risks and the financial performance of deposit taking microfinance institutions in Kenya.

H₀₅ c) There is no significant moderating effect of financial regulations on the relationship between foreign exchange risk and the financial performance of deposit taking microfinance institutions in Kenya.

H₀₅ d) There is no significant moderating effect of financial regulations on the relationship between interest rate risk and the financial performance of deposit taking microfinance institutions in Kenya.

1.5 Significance of the Study

Financial institutions especially deposit taking microfinance are required to manage their financial risk to prevent them from high levels of risk exposure and performance deterioration. Microfinance institutions use deposits to generate credit for their borrowers, which are a core revenue generating activity for those firms. Financial risk

is an area of interest in financial institutions and there is need to develop improved processes and systems to deliver better visibility into financial performance.

The topic of financial risk and financial performance is of great importance to regulators, depositors, industry participants and investors. The research may add great value to the microfinance sector, scholars, investors and regulatory bodies. It may help the regulators to understand the scope to financial risks and how to strengthen the systems in the financial industry in terms of policies.

The top executives in DTMFI may undoubtedly appreciate more on effects of financial risk on the financial performance and moderating effect of financial regulation. They may have an opportunity of using the study's findings and engage the relevant stakeholders to determine whether to mitigate financial risk in a bid to maximize returns. The study findings may assist in addressing the existing knowledge gap in financial risk management affecting financial performance of DMFI in Kenya.

The research information would also provide very important information to help and benefit researchers, makers of policies, and planners as well as implementers in monitoring and evaluation of facts that exist on how financial risk management strategies contributed to the financial performance of DTMFIs. The research findings may be important to the regulator in designing policies meant to foster the financial performance of microfinance institutions in the country. This may foster the financial risk management within the institutions.

The findings of the study may also be of importance to the management practice within the institutions. This may enhance managerial decision making as well as enhance operations within the institutions. The findings of the research may also be

integral to academicians and researchers alike as a source of empirical evidence and for further research.

The Microfinance industry is the Economic Pillar of Kenya's Vision 2030. According to Robinson (2002), microfinance enables clients to protect, diversify and increase their incomes as well as to accumulate assets and reduce vulnerability to income and consumption shocks. Improvement in the financial performance of this industry will be a great benefit to the Kenyan economy and the achievement of the millennium development goals.

1.6 Scope of the Study

The scope of the study was contextually limited to an examination of financial risks, financial regulation and financial performance within deposit taking microfinance institutions in Kenya. The study focused on a review of the financial performance of the institutions for the period 2010-2018 presenting the time scope of the DTMFIs operating and regulated in Kenya. The geographical scope of the research study was limited to an examination of deposit taking microfinance institutions in Kenya. The study focused on the 13 Deposit Taking Micro Finance Institutions which were regulated as at 2018.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on a review of related literature by examining concepts, theories and the existing literature in relation to the study. The literature reviewed was subjected to a critical analysis to establish the gap and facilitate the illustration of the reviewed variables relationship in a conceptual framework. It also focused on an examination of the theories linking the examination of the study variables.

2.2 Review of Concepts

2.2.1 Concept of Financial Performance

According to Nandan (2010) financial performance can be defined as a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. Maseko and Manyani (2011) aver that accounting systems provide a source of information to businesses operating in any industry for use in the measurement of financial performance. Firm performance is measured over time by using the average stock market change per year and other accounting measures.

Brealey, Myers and Marcus (2009) indicate that financial performance can be measured in terms of profitability, liquidity, solvency, financial efficiency and repayment capacity. Profitability is the measures of the profit generated by a firm through the use of its productive assets; liquidity measures the ability of a firm to meet its obligations when they fall due; solvency measures a firm ability to pay all its financial obligations if all of its assets are sold. When accounting information is used, accounting ratios are employed. Among the common accounting ratios used to measure profitability are; return on assets (ROA), return on equity (ROE) and return on capital employed

(ROCE). The current research utilized both ROA and ROE as measures of financial performance.

CBK (2014) highlights that, in terms of their financial performance, without commercial banks, total assets of the DTMI sector stood at KES 57.4bn as of December 2013 posting 26.7% annual growth. The market shares of Credit only MFIs and MFBs remained stable with the two segments accounting for 28% and 72% respectively of the total assets for the sector without banks over the past 3 years. Credit-only MFIs registered stronger asset growth compared to MFBs over the past years. For all segments, a slower paced growth was achieved in 2013 compared to the previous year. The whole sector (over the past 3 years) and the sector without banks (since 2012) are mostly funded by deposits, representing 63.9% and 50.9% of total liabilities and equity respectively.

The financial risk influences the volatility of the financial (Dimitropoulos, Asteriou, & Koumanakos, 2010) and hinders the corporate financial performance of institutions. The financial performance and financial risk have two ways of interaction and each component is vibrant to another for corporate operation's sustainability. According to Ruziqa (2013), the financial risk contributes to negative effect on return on assets and return on equity. The liquidity risk indicates has a negative association of firm's performance (Kharawish, 2011).

Ndung'u (2013) investigated on the effect of financial risk management on financial performance of oil companies in Kenya. The study shows that many firms find it challenging to identify risks since these risks overlap the specific company specific risks and those that affect all firms within the market or sector of the economy. Many companies have resorted to using hedging analysis to identify and limit financial risks.

Wanyama (2016) on financial risk management practice in manufacturing and allied companies listed on the Nairobi Securities Exchange mentioned that some of the hedging tools used by firms include future contracts, forwards and swap contracts. None of the above studies considered microfinance banks in Kenya.

2.2.2 Concept of Financial Risk

Financial risk has become a significant part of firm management after the financial crisis in 2007 and 2008. The business environment is enmeshed with financial risks which can have a negative impact on an organization existence and success (Anas & Fauziah, 2014). Firms have recognized the significance and necessity of managing risks and the importance of doing this in a more coordinated way by considering both internal and external environment to adequately understand and manage these risks. This way they avoid possible financial losses and damage to company reputation (Davis, Donkoh, Mawah, & Amonoo, 2018). Firms that fail to manage risk, fail to maximize on the opportunities that risky environment present to them for their own competitive advantage. Weak risk management system was a major contributing factor to the financial crisis in United States of America (USA) in 2008. The crisis affected the economy and financial markets in the USA leading to collapse of the mortgage industry (Soileau, 2010).

According to Panigrahi (2013), the financial risk defines the corporate ability to meet expected and unexpected demand for cash through continuing cash flow. The financial risk is the risk at which the corporate institutions do not have enough cash to use for its own obligation. However, if a company does not hold enough cash, experiences to not pay suppliers, banks, and other parties on time (Boermans, 2011).

The financial risk is signified by the failure of financial performance. The fact of increasingly aggressive and dynamic competitive environment, various companies are always experiencing the financial risks from multi-dimensional problems (Haneef, Riaz, Ramzan, & Rana, 2012). Corporate incompetence and weakness are mainly caused by lagging and failure of financial risk identification. The financial risk is basically generated in the process of financial activities, accumulation and amplification. This can eventually lead to financial crisis of a company (Haversjo, 2009). Financial risk is the principle of corporate risk and the cyclical manifesting of which is an objective law undecided by will of people. Thus, financial risk identification is the key and core of corporate competitiveness (Zhang, Feng, & Jiang, 2009).

Financial risk comprises: credit risk, liquidity risk, interest rate risk and exchange rate risk; all of them contribute to the volatility of financial performance (Dimitropoulos, Asteriou, & Koumanakos, 2010). The credit risk is the core of financial risk that hinders corporate performance mostly in Africa. This risk varies net worth of assets due to the failure of the contractual debt of the counterpart to meet the regulations. Liquidity risk concerns to the inability of the company to reduce its liabilities and increase its assets. Liquidity risk of any company is measured taking the liquid assets over deposits (Al-Khouri, 2011)). When corporate borrowing interest rate is greater than the market rate, the company may face interest rate risk. The interest rate factors measure as total loans and deposits (Al-Khouri, 2011). The exchange rate risk is abided with local currency depreciation, a price rising and decreasing in output (Blach, 2010). When foreign currency depreciates, the companies experience a quick exchange rate loss (Boermans, 2011).

According to Adeusi, Akeke, Adebisi and Oladunjoye (2014) financial risks relate to the financial operation of a business and many take different forms, for instance; currency risks, interest rate risks, credit risks, liquidity risks, cash flow risk, and financing risks. Financial risks vary from one organization to another, for example, an international firm will be more exposed to currency risk than a firm that operates only domestically. This study examined the credit risk, foreign exchange risk, liquidity risk and interest rate risks and how they affect the financial performance of microfinance banks in Kenya.

2.2.3 Concept of Financial Regulation

According to Peck Cristen et al.,(2003) states that in order to promote microfinance effectively and maintain its sustainability, there must be a suitable regulatory system in place. The various study showed that microfinance institutions must be able to enter the arena of a licensed and prudentially supervised financial intermediation, while at the same time; regulations must be crafted in such a way that allows the effective and efficient development of the MFIs.

Ali (2015) states that availability of a set of enforceable binding rules called prudential regulation or prudential supervision that govern the conduct of microfinance providers are important. According to Chaves and Vega, (1994) defines prudential regulation refers to a set of general principles or legal rules that aims to contribute to the stable and efficient performance of financial institutions and markets. The main objective of prudential regulation is to ensure the financial soundness of financial intermediaries such as banks, microfinance institutions, and to prevent financial system instability (Ali, 2015). Thus Financial regulations are implemented to secure financial stability and to prevent systemic financial risk. Dewatripont and Tirole (1994) states that Prudent

financial regulation and supervision are considered essential in financial institution industry since consumers cannot monitor banks' complexity of financial products effectively. However, the fragility of financial market can be originated from inconsistent government policy which hampers the effective regulations and supervisions and leads to financial crisis (Caprio et al. 2008). According to Petersen et al.,(2009) they are three types of financial regulations capital regulation, official supervisory power, and private monitoring .

2.3 Theoretical Review

The theoretical framework shows the understanding of theories and models by the researcher for concepts relevant to research topic and the whole area of field which the research relates (Kiaritha, 2014). The selection of a theory depends on its appropriateness, application, and explanatory power to the study which should be relevant to the study area of the research topic and it connects the researcher to existing knowledge (Hannah, 2015). The current research was anchored on the risk management theory which advocates for the examination of risk facing institutions as they pose an inherent risk on the firm value.

2.3.1 Risk Management Theory

David (1997) developed this theory aiming to study why risk management was required, and outlines theoretical underpinning under contemporary bank risk management; its emphasis is on market and credit risks. The theory indicates that market and credit risks would have either direct or indirect effect on banks survival (Eichhorn, 2004). Regulators are concerned with overall risk and have minimum concern with individual risk of portfolio components as managers are capable of window dressing the bank position. The need for total risk shows that measurement of

risk cannot be centralized as risk of a portfolio is not just a sum of component as per Markowitz theory. This implies that portfolio risk must be driven by portfolio return which is invariant to changes in portfolio composition (Beverly, 2015).

This theory identifies major source of value loss as Market risk being a change in net value of asset due to change in interest rate, exchange rate, equity and commodity prices (Wu & Olson, 2010). Regulatory requirements and alternative choices require managers to consider risk return trade off, Measurement of risk is costly thus bank managers compromise between precision and cost (Sovan, 2010). Trade off will have profound effects on any method adopted by the bank. They have one risk measurement goal knowing to a high degree with precision and the maximum loss that the bank will likely experience (Muhammad & Bilal, 2014). Regulators may set capital requirements to be greater than estimated maximum loss to ensure non-failure (Eichhorn, 2004).

Risk management theory has two principle approaches to measurement of risk, scenario analysis and value at risk (Sovan, 2009). Scenario analysis approach does not require distribution assumption of the risk calculation and it's very subjective and assumes that future results will resemble those of the past (Wilfred, 2006). Value at risk (VAR) uses asset return distribution to estimate the potential losses. This method incorporates sound economic theory that incorporates market structure (Muhammad & Bilal, 2014). This theory was integral in examining financial risks that accrue to the deposit taking microfinance institutions in Kenya.

2.3.2 The Stakeholder Theory

This theory was initially established by Freeman (1994) as a managerial tool, and has in time developed into a firm's theory with a high descriptive potential. It concentrates on the balance of stakeholders' interests as the determining factor of company policy.

The most promising contribution to risk management is the extension of implicit contracts theory from employment to other agreements, including sales and financing (Cornell & Shapiro, 1997). Company value can be drawn from customers trust that a company will be able to offer its services in future. The value of the implicit claims however, can be sensitive to the anticipated costs of financial suffering and insolvency.

Since corporate risk management practices lead to a reduction in expected costs, company value rises (Klimczak, 2005). Therefore, stakeholder theory, gives knowledge into the possible foundation for risk management. Stakeholder theory has it that the smaller the firms, the more they are likely to go through financial difficulties, and this should see them intensify their interest in risk management strategies adoption. The theory further indicates that companies need more efficient risk management strategies to improve the company value. However, the theory falls short in determining how different risk management strategies influence the financial performance of firms. The theory was relevant in the current study in identifying how financial risk management strategies can be employed by the management of deposit taking microfinance institutions to foster their credit risks and improve the financial performance. The level of credit risk management helps to foster the asset quality and loan book of institutions which is essential to improving the shareholder value.

2.3.3 Shiftability Theory of Liquidity

Maness (2005) cites Moulton (1915) and argues that liquidity of banking institutions is premised on marketability or transferability of institution assets. The ability of the institution to efficiently manage assets that can be simply transferred in a secondary market without delay and appreciable loss is a fundamental source of liquidity. According to the theory, for an asset to be classified as shift able, it must be instantly

transferrable with no unacceptable loss arising from the transfer of the asset when the need arises (BCBS, 2015). This definition is mainly applicable to short term financial assets. For instance, Treasury bills, banker's acceptance and commercial paper which could be easily converted in a secondary market (Imamul & Arif, 2015).

In times of general financial meltdown, when all banks are in need of cash, the theory suggests that all shift able assets should be transferred to the central bank as the primary source of funding during turbulent times in the financial sector (Panigrahi, 2013). Das, Chowdhury, Rahman and Dey (2015) contends that in order to enhance transferability without delay and appreciable loss, such assets should meet three conditions: Appropriate mix of assets of the bank, liquidity management theory and liability management theory

The major shortcoming of the shift-ability theory is that it did not consider the fact that in times of acute financial crisis, assets cannot be shifted to others and in an event where all banks simultaneously shift their financial assets; it would adversely affect both the providers of credit and debtors. Casu *et al.* (2006) observed that during financial meltdown, the smooth functioning of the secondary financial market as an intermediary for transferring financial assets can be interrupted which makes it difficult for banks to have access to liquidity to meet the demands of their activities. The theory was integral in the current study in expanding the knowledge on how liquidity risk management can foster the financial value of the microfinance institutions.

2.3.4 New Theory of Financial Regulation

The basis for the new theory of financial regulation is the requirement to know the regulation is needed to foster a stable economic structure in order to avert the price and output volatility that can lead to financial crises (Mureithi, 2012). The central banks

role as a regulator having an independent preeminent role to target inflation and induce the correct price signals regarding the cost of capital in order to mould market participants' behaviour as to the allocation of scarce resources (Campbell, 2006). According to Campbell (2006) the other regulation is multi-faceted and also involves establishing a regulatory model; the function is to contain and mould the risk taking and management behaviour of both financial and non-financial institutions. This is done through prudential supervisory systems appropriate to the strengths or weakness of the protective measures (Campbell, 2006).

2.3.5 Theory of Micro Prudential Regulation

The theory of micro prudential is an approach which regulation is partial-equilibrium in its conception, the main focus is on averting the costly failure of individual financial institutions (Mureithi, 2012). According to Bernanke (2008) the risk of caricature, traditional micro-prudential regulation of banks can be said to be based on the fact that banks finance themselves with government-insured deposits. In addition, the safety-and-soundness regulation, supervisors often focus on the financial conditions of individual institutions in isolation (Mureithi, 2012). An alternative approach, which has been called system wide or macro prudential oversight, would broaden the mandate of regulators and supervisors to encompass consideration of potential systemic risks and weaknesses as well. Bernanke (2008) posit that macro prudential approach identifies the prominence of general-equilibrium effects, and seeks to protect the entire financial system. The goal of capital regulation is to force financial institutions to internalize the losses on their assets, thereby protecting the deposit insurance fund and mitigating moral hazard. An important element of capital regulation as it is implemented in practice is the principle of prompt corrective action which requires that financial

institution take immediate steps to restore its capital ratio in the wake of losses (Bernanke, 2008)

2.4 Empirical Review

2.4.1 Liquidity Risk and Financial Performance

Sufian and Kamarudin (2011) examined the determinants of Bangladesh banking sector profitability, where bank-specific and macroeconomic determinants were evaluated. The research findings revealed that liquidity levels significantly affect the bank's profitability this is consistent with (Dang, 2011) who found that adequate level of liquidity is positively related with bank profitability. Other authors found contradicting findings where the relationship between liquidity risk and bank profitability in Kenya was insignificant (Ongore & Kusa, 2013).

Kim (2015) investigated the impact of liquidity risk on banks performance in European Union countries panel data for the three-year period to 2009 and sample data from 23 European Union countries was used. The findings were that there is a negative relationship between liquidity ratios and performance. On the hand other authors in their research on liquidity risk and performance in EU countries found the ratio of loans to deposits as a proxy for liquidity risk significant and positively related to net interest margins (Chortareas, Girardone & Ventouri, 2011). Umar, Muhammad, Asad and Mazhar (2015) in their study on impact of liquidity risk management on firms' performance in the conventional banking of Pakistan. Two banks were used in the study for the period 2009 to 2013. The results indicated that current ratio was negative and significant to performance. None of the above studies was however conducted locally hence the findings may not be representative of the current research scope.

Arif and Anees (2012) undertook a research on liquidity risk and its effects on banks profitability in Pakistan. The research found that there existed significant negative relationship between liquidity, deferred loans, liquidity gap with performance. Ahmed and Ahmed (2012) examined the effects of liquidity risk on the financial performance of Pakistan banks. The research focused on 22 banks in Pakistan and utilized secondary data for the period 2004 to 2009. The findings were bank deposit and cash had a significant positive relationship to performance while non-performing loans ratio had a negative relationship to performance.

Anas and Fauziah (2014) researched on impact on financial risk on Islamic banks in Malaysia. Performance was measured by return on assets, independent variables were credit risk, liquidity risk and rate of return risk, the research was controlled by GDP, inflation rate and bank size. Sixty-five global Islamic banks for a period of eight years from 2004 -2011 were used in the study. Panel data were used and panel unit root test was applied where fisher type (ADF) unit root was used. The findings indicated that liquidity risk had positive relationship with (ROA) but not significant, hence not regarded as absolute determinant of fully-fledged Islamic bank profitability. The research however focused on Islamic banks globally whereas the current study examined DTMFI in Kenya.

Song'e (2015) conducted a study the effect of liquidity management on the financial performance of deposit taking Saccos in Nairobi County. A sample of the 27 Deposit taking Saccos that are licensed under Sacco Society Regulatory Authority was carried out where secondary data was collected from their published financial statement between years 2010 to 2014. SASRA. The researcher used descriptive statistics, regression analysis and correlation efficient method. The findings were that financial

performance as measured by profit before tax over total assets is positively related to Liquidity, funding liquidity risk, operational efficiency, quick ratio and log of total assets. The study however focused on deposit taking Saccos whereas the current study scope was limited to DTMFI in Kenya.

Muriithi and Waweru (2017) examined the effect of liquidity risk on financial performance of commercial banks in Kenya for the period 2005 and 2014 for all the 43 registered commercial banks in Kenya. The independent variables proxies for liquidity risk included liquidity coverage ratio and net stable funding ratio and dependent variable for performance was return on equity (ROE). Data was collected from commercial banks website and Central Bank of Kenya. Panel data techniques of random effects estimation and generalized method of moments were used. Findings of the research indicated that net stable funding ratio is negatively associated with bank profitability both in long run and short run. The findings of the study further indicated that liquidity coverage ratio was not significantly related to the financial performance for commercial banks in Kenya both in long run and short run.

2.4.2 Credit Risk and Financial Performance

Rasika and Sampath (2015) carried out a study to investigate in to the effect of Credit Risk on the Financial Performance of Commercial Banks in Sri Lanka with special reference to Systemically Important Banks from 2011 to 2015 using quarterly financial reports. The secondary data collected from the bank's annual reports was analyzed using multiple regression analysis. Results of the analysis indicated that there was positive effect of credit risk and the financial performance. The study further indicates that credit risk still remains a major concern for the commercial banks in Sri Lanka because and it is an important predictor of bank financial performance. Asad, Syed,

Wasim and Rana (2014) from Pakistan banking sector researched on credit risk exposure and performance for five-year period to 2010 using fixed effects regression analysis which showed loans and advances to deposit ratio and loan loss provision to non-performing loans had a significant negative relationship to performance. The study however focused on commercial banks in Pakistan and Sri Lanka whereas the current research focused on microfinance banks in Kenya.

Imamul and Arif (2015) in their research on relevance of financial risk with financial performance an insight of Indian Banking Sector. The financial data was collected from the annual reports of the selected commercial banks and annual reports from the banks websites. The research covered a five-year period. This research utilized selected ten leading banks, five from public sector and five from private sector. The findings of the regression analysis indicated that credit risk had a positive and significant effect on the financial performance of Indian Commercial Banks. The study only relied on secondary data whereas this research adopted a mixed research methodology.

Harison and Joseph (2012) in their research credit risk and profitability of selected rural banks in Ghana, the independent variables were capital adequacy and non-performing loans as proxies for credit risk and return on assets measured performance. Panel data was used for the period 2006 to 2010. The findings showed that non-performing loans had a positive and significant relationship to performance. Sangare (2017) on the other hand researched on impact on credit risk and banks performance for member states of West African Economic and Monetary Union; twenty banks for a period of nine years were used. Random effects model was applied after Hausman test in the data analysis process. Non-performing loans ratio and loan loss provision as measures of credit risk had a negative significant relationship with return on assets a measure of performance.

The study recommended that banks should review their lending policy and inject more cash flows so as to improve the credit risk management process. The above study focused on regular commercial banks whereas this study examined microfinance banks in Kenya.

Olusanmi, Uwuigbe and Uwuigbe (2013) in their research effects of risk management on banks financial performance in Nigeria banks, their study considered 14 banks listed on the Nigeria security exchange for the period 2006-2012. The independent variables were non-performing loans ratio, capital ratio, loan to total deposit ratio, risk disclosure. The dependent variables to measure performance were return on equity and return on assets. The study used regression analysis and the findings were non-performing loan and loans to deposit as a measure of credit risk had no significant influence on performance though the relationship is negative.

Gakure, Ngugi, Ndwiga and Waithaka (2012) examined the effects of credit risk management techniques on banks' performance of unsecured loans in Kenya found that credit risk had a negative relationship to performance this resulted to imposition of constraints on bank's ability to meet its business obligation when due. Tarus, Chekol and Mutwol (2012) in their research on Kenyan banks for five-year period to 2009 found a positive relationship between credit risk and performance. The studies however focused on commercial banks and did not take into consideration DTMFI in Kenya.

2.4.3 Foreign Exchange Risk and Financial Performance

Foreign exchange exposure is commonly addressed through a company's management policies, intuition and former experiences (Njunge, 2012). Forex risk mitigating methods embrace forward contracts, cross-currency swaps, options, leading and lagging, netting and value changes. Several studies conducted on strategies of risk

management, most of them targeting financial performance impact on completely different entities (Oduori, 2012).

James, Ted and Sorin (2011) researched on foreign exchange risk and the cross section of US returns during the period 1973 to 2002 it was shown that firms with extreme absolute sensitivity to foreign exchange have low required rate of return than other stocks. The market price of foreign exchange risk was found to have negative relationship with stock returns. Gino Lucio and Ilias (2014) researched on foreign exchange risk and their predictability of carry trade returns found a negative predictive relationship between risk and realized returns.

Xiangnan, and Xin (2012) conducted a research on foreign exchange sensitivity of Chinese bank stock returns. Their research employed Generalised Autoregressive Conditional Heteroskedasticity (GARCH) model to investigate effects of foreign exchange of 14 listed Chinese banks in Shanghai and Shenzhen Stock Exchange. The daily percentage change for foreign exchange were used, the daily mean return for the period 2007 to 2010 foreign exchange risk was negatively correlated to returns. The research however concentrated on Chinese commercial banks whereas the current study targetted Microfinance Banking Institutions in Kenya.

Davis, Donkoh, Mawah and Amonoo (2018) studied the effect of internal financial risk management in Microfinance Companies: A Case Study of Akuapem Rural Bank, Ghana. The research employed a case study research design focusing on a single microfinance bank. The study utilized secondary data collected for the period 2008-2015 and analyzed using regression analysis, descriptive analysis, trend analysis and ration analysis. The findings of the study indicated that the profitability of the microfinance banks was positively affected by foreign exchange risk, bank size and

interest rate income. The study however utilized a case study research design whereas this study utilized a causal research design. The current study further targetted all microfinance banks in Kenya.

Noor and Abdalla (2017) researched on the impact of financial risks on the firms' performance of firms in Kenya, the objectives of the study were to find out how credit risk affect firms' performance. The study sought to examine how liquidity risk, market risk and foreign exchange risk affected the financial performance. The study relied only on secondary data. The findings were there was a significant relationship between the variables of risk and financial performance. The findings of the analysis further indicated that foreign exchange risks make firms realize unpredictable losses hence this affect their performance. The research however did not focus on banking institutions which is the current research scope.

Chege and Obwogi (2018) conducted a study on the effect of currency risk internal hedging strategies on the value of the firm: Evidence of Listed Commercial Banks in Kenya. The study specifically examined netting, leading and lagging and pricing adjustment of the value of listed commercial banks. The study focused on 10-listed commercial banks. The study utilized secondary data which was collected from the annual reports submitted to the CBK by the banks and annual financial reports by banks for the period between 2009 and 2015. Descriptive analysis and panel data regression analysis were applied in the study. The study found that use of internal hedging tools had a significant influence on the value of listed commercial banks in Kenya. The study indicated that adopting internal hedging strategies reduce currency risk which is key to fostering profitability of commercial banks. The study however focused on listed

commercial banks whereas the current research examined deposit taking microfinance institutions in Kenya.

2.4.4 Interest Rate Risk and Financial Performance

Aykut (2016) researched on the effect of credit, interest and foreign exchange rate risk on the bank index and bank stock returns. For this there were 49 banks in total, 32 of them being deposit, 13 development and investment and 4 of them participation banks. The study employed both descriptive statistics and inferential analysis. The results showed interest rate risk had a statistically negative and significant effect on the volatility of bank profitability. The effect of foreign exchange risk on bank return volatility was significant and positive Credit risk had a negative and significant effect on bank index and bank returns volatility.

Simba (2010) examined the relationship between borrowing interest rates and non performing loans in Deposit Taking Microfinance Institutions in Kenya' in a 4-year period of 2008 to 2012. The research utilized secondary research data and relied on both descriptive and inferential statistics in analyzing the collected data. Findings of the research indicated that there was a general increase in the borrowing interest rates and nonperforming loans. His results further showed that there was a weak relationship between borrowing interest rates and nonperforming loans thereby meaning that with a higher lending rates, the higher the nonperforming loans in the deposit taking microfinance institutions. The study was limited to a 4-year period whereas the current study was limited to an 8-year period giving a more precise estimation of the causality of the study variables.

Mang'eli (2012) analyzed the relationship between interest rate spreads and financial performance of commercial banks. The study using descriptive research design found

that the interest rate spread has an effect on the financial performance of commercial banks as measured by the return on assets and profitability. The interest rate spread affects the performance of commercial banks as it increases the interest rates on loans. The research further indicated that regulations on interest rates had a high influence on the performance of commercial banks since the interest rate spread was a key instrument to mitigate moral hazard and adverse selection in the banking sector. The research however focussed purely on secondary data whereas the current study utilized a mix of primary and secondary research data.

Kirimi (2015) analyzed the effect of interest rate spreads on financial performance in the Kenyan banking industry. The study utilized systematic random sampling technique in 44 commercial banks within Nairobi County. The study analyzed the relationship between interest rate spread, performance and credit risk found that the interest rate spread had a huge influence on the credit risk. Regulations by the Central Bank of Kenya on interest rates spreads led to higher levels of credit risk. As the Central Bank allowed higher levels of interest rate spreads, the credit risk increased. This negatively influenced the banks performance since the interest rate spread was a key determinant of profitability in commercial banks in Kenya. The research however focused on commercial banks whereas the current research focused on microfinance banks in Kenya.

Kathomi, Maina, and Kariuki (2017) examined the effect of interest rate regulation and sustainability of microfinance institutions in Nairobi County, Kenya. The study was guided by the liquidity preference theory and utilized descriptive research focusing on 49 microfinance institutions within Nairobi County. The study relied on primary data collected using semi-structured questionnaires. The collected data was analyzed using

correlation analysis and ANOVA tests. The findings indicated that there was statistically and significant negative effect of lending rates on sustainability of MFIs. This means that increasing the interest rate reduces the return thus rendering the MFIs unsustainable. The research however focused on regular MFIs whereas the current study examined the deposit making microfinance institutions regulated by the Central Bank of Kenya.

2.4.5 Regulation and Financial Risk

The business environment is enmeshed with financial risks which can have a negative impact on an organization existence and success (Anas & Fauziah, 2014). The financial risk influences the volatility of the financial (Dimitropoulos, Asteriou, & Koumanakos, 2010). Firms have recognized the significance and necessity of managing risks and the importance of doing this in a more coordinated way by considering both internal and external environment to adequately understand and manage these risks. Peck Cristen et al.,(2003) states that in order to promote microfinance effectively and maintain its sustainability, there must be a suitable regulatory system in place. The various study had showed that microfinance institutions must be able to enter the arena of a licensed and prudentially supervised financial intermediation, while at the same time; regulations must be crafted in such a way that allows the effective and efficient development of the MFIs. This way they avoid possible financial losses and damage to company reputation (Davis, Donkoh, Mawah, & Amonoo, 2018).Firms that fail to manage risk, fail to maximize on the opportunities that risky environment present to them for their own competitive advantage. The main objective of prudential regulation is to ensure the financial soundness of financial intermediaries such as banks, microfinance institutions, and to prevent financial system instability (Ali, 2015).

2.4.6 Regulation and Financial Performance

Brealey, Myers and Marcus (2009) proposes that financial performance can be measured in terms of profitability, liquidity, solvency, financial efficiency and repayment capacity. To promote microfinance performance and maintain its sustainability, there must be a suitable regulatory system in place (Peck Cristen et al., 2003). The financial risk influences the volatility of the financial (Dimitropoulos, Asteriou, & Koumanakos, 2010) and hinders the corporate financial performance of institutions. The financial performance and financial risk have two ways of interaction and each component is vibrant to another for corporate operation's sustainability. Thus Financial regulations are implemented to secure financial stability and to prevent systemic financial risk. Dewatripont and Tirole (1994) states that Prudent financial regulation and supervision are considered essential in financial institution industry since consumers cannot monitor banks' complexity of financial products effectively.

Hartarska and Nadolnyak (2007) studied the impact of regulation on operational efficiency and outreach of 114 MFIs from 62 countries. Data analysis on empirical evidence and macroeconomic and institutional framework revealed that regulation of MFIs have no direct effect on economic, operational or outreach success. The savings however have a positive impact on both dependent variables, but if regulation is the only way to access and encourage savings then the institution's will not benefit from the regulation.

2.5 Critical Review Analysis

2.5.1 Concept vs empirical

The review of literature in the study indicate that bulk of past empirical studies have analysed the effect of financial risk management on the financial performance based on

different indicators. However, few have incorporated the moderating effect of regulation on the performance. The performance measurement indicators that have been used in most studies is ROA and ROI as a measure of profitability. Moreover, most of studies have focused on the effect of financial risk management and financial performance of Microfinance institution and commercial banks (Muteti, 2014; Mwangi,2014; Lukorito, Muturi, Nyang'au and Nyamasege,2014) Tarus, chekol and Mutwol 2012). The review of most empirical evidences and results of different research have indicated a varied trend on the effect of financial risk management components on financial performance. Review from previous literature suggests of evidence indicating that where related indicators of financial performance has been employed conflicting empirical results have been provided. Other research studies have shown a significant or insignificant positive effect while others have shown significant or insignificant negative correlation.

2.5.2 Concept vs theory

Risk management theory emphasis on market and credit risks; theory indicates that market and credit risks would have either direct or indirect effect on banks survival (Eichhorn, 2004). However, deposit taking microfinance are faced with various risks as opposed to credit and market risk only. The need for total risk shows that measurement of risk cannot be centralized as risk of a portfolio is not just a sum of component as per Markowitz theory. This implies that portfolio risk must be driven by portfolio return which is invariant to changes in portfolio composition (Beverly, 2015). Adeusi, Akeke, Adebisi and Oladunjoye (2014) states that financial risks relate to the financial operation of a business and many take different forms, for instance; currency risks, interest rate risks, credit risks, liquidity risks, cash flow risk, and financing risks. However, the theory focus on credit and market. Financial risks vary from one industry

to another and also the country. Peck, Cristen et al.,(2003) states that in order to promote microfinance effectively and maintain its sustainability, there must be a suitable regulatory system in place . However, the fragility of financial market can be originated from inconsistent government policy which hampers the effective regulations and supervisions and leads to financial crisis (Caprio et al. 2008). Petersen et al., (2009) indicates that they are three types of financial regulations capital regulation, official supervisory power, and private monitoring. The regulation of financial intermediaries is an important function of central banks and is a topic of frequent debates in the policy-making community. According to Allen and Gale, (2004) the regulation takes the form of the imposition of liquidity and that stipulates a minimal portfolio share to be held in the short term asset by intermediaries. The stakeholder theory concentrates on the balance of stakeholders' interest as the determining factor of company policy. This theory falls short in determining how different risk management strategies influence the financial performance.

Brealey, Myers and Marcus (2009) indicate that financial performance can be measured in terms of profitability, liquidity, solvency, financial efficiency and repayment capacity.

2.5.3 Theory vs empirical

Muriithi and Waweru (2017) examined the effect of liquidity risk on financial performance of commercial banks in Kenya for the period 2005 and 2014 for all the 43 registered commercial banks in Kenya. Findings of the research indicated that net stable funding ratio is negatively associated with bank profitability both in long run and short run. The findings of the study further indicated that liquidity coverage ratio was not significantly related to the financial performance for commercial banks in Kenya both

in long run and short run. The risk management theory outlines theoretical underpinning contemporary bank risk management; its emphasis is on market and credit risks. The theory indicates that market and credit risks would have either direct or indirect effect on banks survival (Eichhorn, 2004). According to new institutional economics theory by Williamson (1998) indicated that this theory is a prediction that the practices of managing risks could be determined using practices that are accepted in the industry or the market. Furthermore, through the theory, security is linked with asset purchase that are specific, implying that management of risk can be significant in contracts binding two sides without giving a chance for diversification, like a corporation in a supply chain or a large contract of financing. According to shiftability theory of liquidity , for an asset to be classified as shift able, it must be instantly transferrable with no unacceptable loss arising from the transfer of the asset when the need arises (BCBS, 2015) .However, the theory doesn't not define and state the nature of an asset. Noor and Abdalla (2017) researched on the impact of financial risks on the firms' performance of firms in Kenya, the objectives of the study were to find out how credit risk affect firms' performance. The study sought to examine how liquidity risk, market risk and foreign exchange risk affected the financial performance. The findings were there was a significant relationship between the variables of risk and financial performance. The findings of the analysis further indicated that foreign exchange risks make firms realize unpredictable losses hence this affect their performance. The research however did not focus on banking institutions which is the current research scope.

2.6 Summary of Literature Review Gaps

Table 2.1 Summary of Literature Gaps

Author	Study Focus	Findings	Research Gap
Asad, Syed, Wasim and Rana (2014)	Credit risk exposure and performance of Pakistani banking sector	Results showed loans and advances to deposit ratio and loan loss provision to non-performing loans had a significant negative relationship to performance	The study however focused on commercial banks in Pakistan and Sri Lanka whereas this research focused on microfinance banks in Kenya.
Davis, Donkoh, Mawah and Amonoo (2018)	Effect of internal financial risk management in Microfinance Companies: A Case Study of Akuapem Rural Bank, Ghana	The findings of the study indicated that the profitability of the microfinance banks was positively affected by foreign exchange risk, bank size and interest rate income	The study however utilized a case study research design whereas this study utilized a causal research design.
Fauziah (2014)	Impact on financial risk on Islamic banks in Malaysia.	The findings indicated that liquidity risk had positive relationship with (ROA) but not significant	The research however focused on Islamic banks globally whereas this study examined DTMFI in Kenya.
Kim (2015)	Impact of liquidity risk on banks performance in European Union countries	The findings were there is a negative relationship between liquidity ratios and performance.	The above study was however not conducted locally hence the findings may not be representative of the current research scope.
Noor and Abdalla (2017)	Impact of financial risks on the firms' performance of firms in Kenya	The findings of the analysis further indicated that foreign exchange risks make firms realize unpredictable losses hence this affect their performance.	The research however did not focus on microfinance banking institutions which is the current research scope.
Simba (2010)	Relationship between borrowing interest rates and nonperforming loans in Deposit Taking Microfinance Institutions in Kenya'	Results showed that there was a weak relationship between borrowing interest rates, nonperforming loans and financial performance.	The study was limited to a 4-year period whereas this study was limited to an 8-year period giving a more precise estimation of the causality of the study variables.

Source: Researcher (2022)

Despite being regulated by the Central Bank of Kenya there has been minimal research interest on how financial risk affect the financial performance of DTMFI. From the reviewed literature, the research gaps are identified. This lack of adequate empirical evidence has motivated this research study. Further studies can focus on a ten-year period in the deposit taking microfinance institutions in Kenya given that adequate data for recent years is available.

2.7 Conceptual Framework

Conceptual framework is a graphical representation of the relationship between variables in a study basing from ideas developed from the researchers' perception of the research (Borg, 2005). This study hypothesized the interaction between the financial risks, financial regulation and the financial performance of DTMFI in Kenya. Financial regulation using core capital requirements was introduced to gauge how financial regulation and financial performance relate. A correlation exists between financial performance and financial regulation according to macro and micro prudential theories.

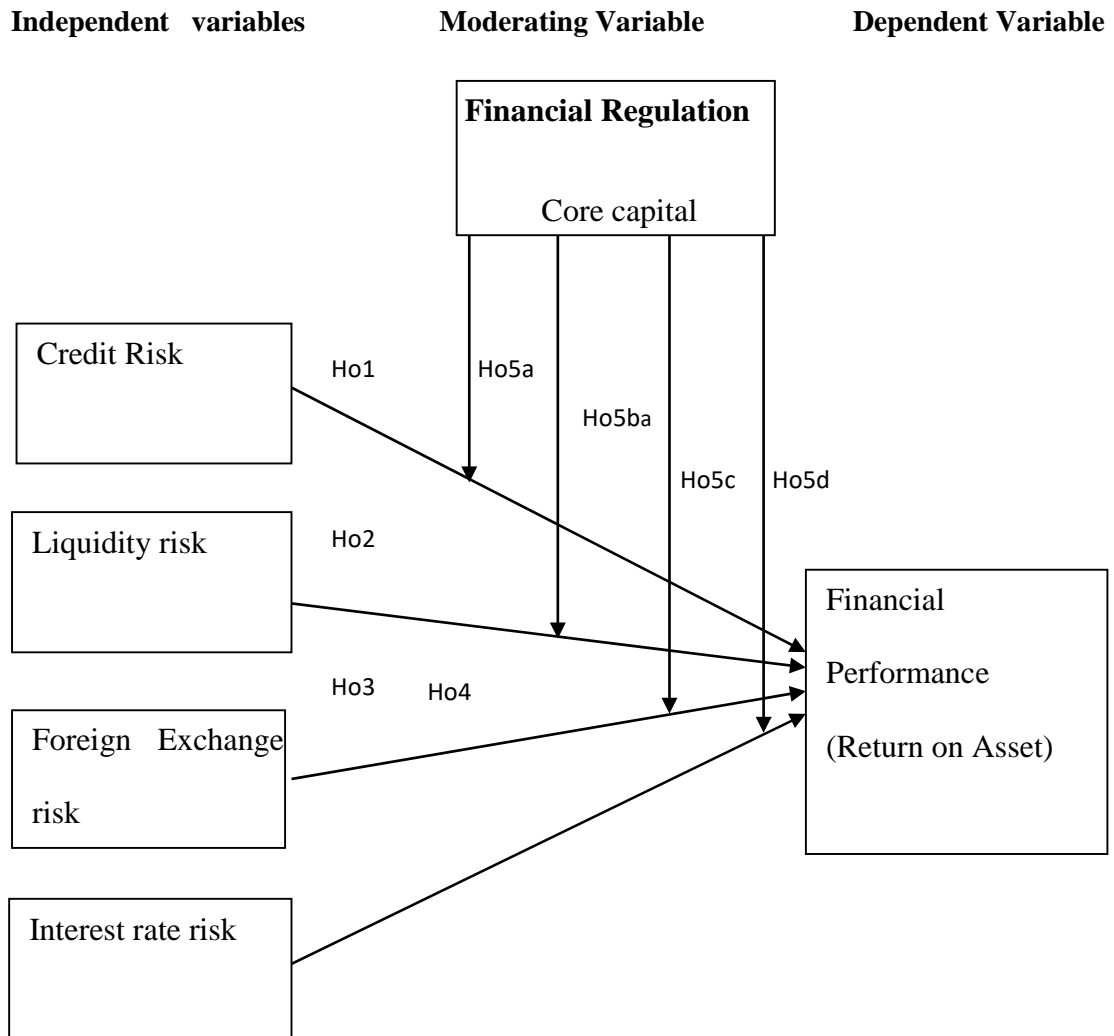


Figure 2.1: Conceptual Framework

Source: Researcher (2022)

The above conceptual framework examines the interaction between the financial risks and the financial performance of DTMFI in Kenya. The financial risks were measured by the level of liquidity risks, the credit risk, the foreign exchange risk and the interest rate risk. The financial performance of the institutions was measured by the level of ROA and ROE. Financial regulation using core capital requirements as regulated by CBK was used.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology used to achieve the study objectives. The chapter particularly discusses the research design, empirical model, and operationalization and measurement of variables. The study also covered the target population and the data collection instruments and procedure. The chapter ends with a description of data analysis techniques, and finally the ethical considerations.

3.2 Research Design

A research design is an arrangement or a structured system used to solve a challenge. It provides guidance to a procedure for carrying out a standard research that should give reliable and unbiased results (Cooper & Schindler, 2003). Research design can also be described as an arrangement of conditions relevant to a study; it is the conceptual framework within which a research is conducted. The current study employed an explanatory research design. Explanatory research sets out to explain and account for the descriptive information. So while descriptive studies may ask what kinds of questions explanatory research seeks to ask why and how questions (Grey, 2014). It builds on exploratory and descriptive research and goes on to identify actual reasons a phenomenon occurs. Explanatory research looks for causes and reasons and provides evidence to support and refute an explanation or prediction. It is conducted to discover and report some relationships among the different aspects of phenomenon under study. It is conducted to discover This research design helped in identifying how financial risk affect the financial performance of deposit taking MFIs in Kenya.

3.3 Target Population

A population consists of the total collection of individuals that a researcher considers relevant to the study (Cooper & Schindler, 2003). The unit of analysis for the research was the 13 deposit taking microfinances in Kenya regulated by the Central Bank of Kenya. The period of study was from 2010 to December 2018. As of December 2018, there were 13 regulated deposit taking microfinance institutions. Since some MFIs were started later after 2010, unbalanced data analyses was adopted because some DTMFIs had not been registered by 2010. The unit of observation was therefore 88 observations from the DTMFIs that were regulated from 2010 to 2018. 2010 was the period after the global crisis of year 2007 - 2008 that affected MFIs with some collapsing. The study was conducted up to the year 2018 given that at the time of proposal writing and data collection data available from CBK website was up to the year 2018. The study was conducted within Kenya. Kenya is suitable because the research can assist other scholars and the ease of access to the secondary data required. The site of the study was chosen since all the DTMFI regulated by the Central Bank have their branches within the Capital City. This allowed for a more convenient process in the data collection phase. (*See Appendix II*).

3.4 Sampling Design and Sample Size

A sampling design is concerned with the method used for selecting the elements to be observed in a research. It is a guideline for obtaining a sample from a population. It refers to the technique or the procedure the researcher uses to select the respondents to be included in a sample. It may also involve identifying the number of elements that should be included in a sample (Kothari, 2004). The study employed the census study method. This ensured that the study purposely takes into consideration all the DTMFIs that are regulated by the Central Bank of Kenya and allowed to receive deposits.

The sampling frame is a list of all individuals in a population under consideration (Zikmund & Babin, 2012). The sample frame for the study was drawn from the 13-regulated DTMFI. The research utilized a census study of all the regulated DTMFI in Kenya.

3.5 Data Collection

The research relied on secondary sources of data. The secondary data for the study was collected from CBK annual supervision reports for the period 2010-2018. Kosikoh (2014) argues that a period of more than five years could help in the computation of various ratios of both the independent and dependent variables for several years for better analysis. Secondary research data from supervision reports from Kenya's central bank website and the individual DTMFI firms. The period 2010-2018 was selected because there was a global financial crisis in 2007-2008 followed by collapse of some DTMFIs. The data available at the time of research was up to 2018. (*See Appendix II*).

3.6 Measurement of Variables

The dependent variable of the study is financial performance of Microfinance Institutions measured using return on assets. Liquidity risk, credit risk, foreign exchange risk and interest rate risk are the independent variables for the study. The moderating variable is financial regulations. This section provides details of how each of the study variables is measured and operationalized.

Table 3.1: Operationalization of Variables

Definition of Variable	Measurement of Variable (s)
Liquidity risks	Liquid assets to Total liabilities.
Credit risks	Non-performing loans ratio.
Foreign exchange risk	Standard deviation of US dollar and Kenya Shilling exchange rate (USD/ KES).
Interest rate risk	Interest income to Total assets
Financial regulations	Core capital ratio (total capital to risk weighted assets)
Financial performance	Return on Assets (ROA) (net income/average total asset)

3.7 Data Processing and Analysis

Ott and Longnecker (2015), define data analysis as a mechanism for reducing and organizing data to produce findings that require interpretation. According to Chatterjee and Hadi (2015), data processing involves translating the answers on a questionnaire into a form that can be manipulated to produce statistics. The data was analyzed using STATA software. During data analysis descriptive and inferential analysis were conducted. Descriptive statistics include mean, minimum, maximum and standard deviations. Inferential analysis includes panel model estimation. The results of the study were presented in form of tables.

Panel data contain observations of multiple phenomena obtained over multiple time periods for the same firms or individuals (Hsiao, 2003). The data is preferred because it reveals changes at the individual firms' level, establishes time order of variables and shows how relationships emerge (Frees, 2004). Panel data regression has been chosen for a number of reasons. Firstly, panel data allows for the control of individual heterogeneity, making it possible to exclude biases deriving from the existence of individual effects (Hsiao, 2003). Secondly, panel data yields more informative data,

more variability and less collinearity among variables than is characteristic of cross-section or time-series data, more degree of freedom and more efficiency (Baltagi, 2005). Thirdly, panel data can be used to obtain consistent estimators in the presence of omitted variables (Wooldridge, 2002). The panel model is;

$$(ROA_{it}) = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it} \dots \dots \dots 3.1$$

Where;

(ROA_{it}) = Financial performance of micro finance institution i at time t

X_{1it} = Liquidity risks of micro finance institution firm i at time t

X_{2it} = Credit risks of micro finance institution i at time t

X_{3it} = Foreign exchange risk of micro finance institution i at time t

X_{4it} = Interest rate risk of micro finance institution i at time t

β_0 = Constant

$\beta_{1..4}$ = Coefficient of the variables

i = Micro finance institution

t = time period (2010-2018)

ε_{it} = Error term of micro finance institution i at time t

Test for Moderation

In order to analyse the moderating effect of financial regulations on financial risk and financial performance of Microfinance Institutions in Kenya, the study modified the dynamic panel data model by Ban˜os-Caballero, *et al.* (2012) as depicted in equation 3.1. The study adopted panel design. A panel design is used when researchers sample a group, or panel, of participants and then measure some variable or variables of interest at more than one point in time from this sample. Moderation effect was tested using Kenny and Baron (1986) approach and the R-squared change value. The moderator

(firm size) was interacted with each of the independent variable as presented in equation 3.2.

$$(ROA_{it}) = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \dots + \beta_1 X_{1it} * M_{it} + \beta_2 X_{2it} * M_{it} + \beta_3 X_{3it} * M_{it} + \beta_4 X_{4it} * M_{it} + \varepsilon \dots \dots \dots 3.2$$

Where;

(ROA_{it}) = Financial performance of micro finance institution i at time t

X_{1it} = Liquidity risk of micro finance institution i at time t

X_{2it} = Credit risk of micro finance institution i at time t

X_{3it} = Foreign exchange risk of micro finance institution i at time t

X_{4it} = Interest rate risk of micro finance institution i at time t

β_0 = Constant

$\beta_{1..4}$ = Coefficient of the variables

i = Micro finance institution

t = time period (2010-2018)

M = Financial regulations(core capital)

ε_{it} = Error term of micro finance institution i at time t

The hypothesis was tested using p-value method. The acceptance/rejection criteria was that, if the p value is greater than the significance level of 0.05, we fail to reject the H_0 but if it's less than 0.05 level of significance, the H_0 is rejected.

Kenny and Baron steps

The Baron and Kenny (1986) method is an analysis strategy for testing mediation hypotheses. In this method for mediation, there are two paths to the dependent variable. The independent variable (financial risks) must predict the dependent variable

(financial performance), and the independent variable must predict the mediator (financial regulation). Mediation is tested through three regressions:

- i. Independent variable predicting the dependent variable
- ii. Independent variable predicting the mediator
- iii. Independent and variable mediator predicting the dependent variable

3.8 Diagnostic tests

3.8.1 Panel Unit Root Test

In view of the fact that panel data have both cross-sections and time series dimensions, there is need to test for stationarity of the time series because the estimation of the times series is based on the assumption that the variables are stationary. Estimating models without taking into account the non-stationary nature of the data would lead to unauthentic results (Gujarati, 2003). In this study, the study employed Fisher-type test of unit root in panel data. The advantages of this test is that it allows for unbalanced panels with gaps, performs either Dickey-Fuller or Philip-Perron test for each panel, and reports four different tests. The null hypothesis of this test is that all panels had unit root. The alternative hypothesis is that at least one panel did not have unit roots or some panels did not have unit root (Choi, 2001). If any of the variables has unit root, the researcher would difference it and run the equations using the differenced variable.

3.8.2 Hausman Test

When performing panel data analysis, one has to determine whether to run a fixed effects model or a random effects model. Whereas the fixed effect model assumes firm specific intercepts and captures effects of those variables which are specific to each firm and constant over time, the random effect model assumes that there is a single common intercept and it varies from firm to firm in a random manner (Baltagi, 2005).

Thus, for estimating the models, first it is important to determine whether there exists a correlation between the independent variables. If the correlation exists then a fixed effect model gives consistent results otherwise random effect model is more efficient estimators and it is estimated by generalized least square (Teruel & Solano, 2007). To determine which of these two models is appropriate, coefficients are estimated by both fixed and random effects. Hausman's specification test (1978) was used to determine whether fixed or random effect should be used. If the null hypothesis that is $E(\mu_i/x_{it}) = 0$ is accepted, then random effect is an efficient estimator otherwise in case of rejection of null hypothesis, otherwise fixed effect estimation is preferred. If Hausman test rejects the null hypothesis, therefore decision is taken to use fixed effect model. STATA was used to estimate the above models.

In the event that the Hausman test identifies the fixed effects model as appropriate, then the researcher tested for inclusion of time-fixed effects in the study estimation. The time fixed effects tests if the dummies for all years are equal to zero and if they are, then there is no need for time fixed effects in the specification of the model to be estimated. To test whether the dummies for all years are equal to zero, F-test was used as proposed by Greene (2008). On the other hand, if the Hausman test selects the random effects model as the more suitable one then there would be need to test whether the panel effects so as to determine whether to run a simple Ordinary Least Square (OLS) regression or the random effects model. Breusch-Pagan multiplier test proposed by Breusch and Pagan (1980) was used to choose between the simple Ordinary Least Square (OLS) regression and the random effects model. The null hypothesis of this test is that variance across the entities is zero, that is, there are no panel effects.

3.8.3 Normality Tests

The normality assumption ($u_t \sim N(0, \sigma^2)$) is required in order to conduct single or joint hypothesis tests about the model parameters (Brooks, 2008). In order to check if the data is normally distributed Bera and Jarque (1981) tests of normality was performed. The study tested the null hypothesis that the disturbances are not normally distributed. If the p-value is less than 0.05, the null of normality at the 5% level is rejected. If the data is not normally distributed a nonparametric test is most appropriate.

3.8.4 Multicollinearity

The study employed Variance Inflation Factor (VIF) to measure multicollinearity (Gujarati, 2003; Cooper & Schindler, 2008). Failure to account for perfect multicollinearity results into indeterminate regression coefficients and infinite standard errors while existence of imperfect multicollinearity results into large standard errors. Large standard errors affect the precision and accuracy of rejection or failure to reject the null hypothesis. During estimation, the problem is not the presence of multicollinearity but rather its severity. When $VIF < 10$; there is no multicollinearity; when $VIF \geq 10$ presence of multicollinearity.

3.8.5 Autocorrelation

Since the data involves both cross section and time-series, it raises the suspicion of the existence of serial correlation. The presence of serial correlation indicates that the variables in the model violate the assumptions of the regression (Anderson *et al.*, 2007). To cater for serial correlation, the Wooldridge test for autocorrelation was employed. Serial correlation is a common problem experienced in panel data analysis and has to be accounted for in order to achieve the correct model specification. According to Wooldridge (2002), failure to identify and account for serial correlation in the

idiosyncratic error term in a panel model would result into biased standard errors and inefficient parameter estimates. The null hypothesis of this test was that the data has no serial correlation. If the serial correlation is detected in the panel data, then the Feasible Generalized Least Squares (FGLS) estimation is adopted.

3.8.6 Heteroscedasticity

Since the data for this research is a cross-section of firms, this raises concerns about the existence of heteroscedasticity. The Classical Linear Regression Model (CLRM) assumes that the error term is homoskedastic, that is, it has constant variance. If the error variance is not constant, then there is heteroscedasticity in the data. Running a regression model without accounting for heteroscedasticity would lead to unbiased parameter estimates. To test for heteroscedasticity, the Breusch-Pagan/Godfrey test was used. The null hypothesis of this study was that the error variance is homoskedastic. If the null hypothesis is rejected and a conclusion made that heteroscedasticity is present in the panel data, then this would be accounted for by running a Feasible Generalized Least Squares (FGLS) model.

3.9 Ethical Considerations

Ethical considerations were observed prior to undertaking of the study. The researcher sought ethical approval from the school of business and economics of Moi University before undertaking the study. The researcher further sought research clearance from the National Commission for Science Technology and Innovation. The study further obtained secondary data from CBK to collect research data. All the collected research data was treated with utmost confidentiality and were only utilized for academic purposes.

3.10 Limitations of the Study

The study was most limited by data availability which may impact the methodology to adopt. Some Microfinance institutions got licensed after 2012 and this could have affected the consistency of data to be collected as some years have missing data. Missing data may affect the precision and accuracy of the model. However, this limitation was addressed by employing unbalanced data analysis approach in the case of some data covering the period 2012- 2018 missing given that some microfinance institutions had not been licensed by the year 2010.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the patterns of the results and their analyses as to their relevance to the objectives and hypotheses. The findings are presented in tables and narrations as per the specific objectives. The chapter presents descriptive statistics, correlation analysis and panel regressions. The chapter further presents the results of the models that were used to interpret study findings and answer study's objectives.

4.2 Descriptive Statistics

Table 4.1 shows the descriptive statistics for liquidity risk, credit risk, foreign exchange risk, interest rate risk, financial regulation measuring using core capital and MFI performance measured using return on assets. In this study, liquidity risk was measured as the ratio of liquid assets to total liabilities. Credit risk was measured using non-performing loans ratio, foreign exchange risk measured as standard deviation of US dollar and Kenya Shilling exchange rate and interest rate risk as ratio of interest income to total assets. Financial regulation was measured using core capital requirement (total capital to risk weighted assets) while financial performance of MFI was measured using return on assets (ratio of net income to average total assets).

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Liquidity risk	0.540852	0.484559	0.03	2.313875
Credit risk	0.138408	0.076067	0.0103	0.306683
Foreign exchange risk	95.2063	8.189483	79.09268	103.9971
Interest rate risk	0.129654	0.060305	0.004785	0.25641
Financial regulation (core capital)	0.435542	0.429125	-0.46	1.971254
ROA	0.277474	0.399954	-0.42857	1.658491

Descriptive results show that the mean average of liquidity risk across MFIs was 0.540852 units with a minimum of 0.03 and a maximum of 2.313875 units. The standard deviation for liquidity risk was 0.484559 implying that total observations were clustered around the mean. Liquidity is the ability of an organisation to have funds to meet their current liabilities as they fall due and the ability to meet increasing loan demands. Liquidity determines financial health of a business or personal investment portfolio. It plays an important role in the successful management of a firm. If a micro finance institution does not manage its liquidity position well, its current assets may not meet its current liabilities. Hence, the MFI may have to find external financing due to having difficulty in paying its short term debts. According to Ongaki (2016), there is a negative relationship between profit ratio and liquidity ratio and an increase in liquidity ratio leads to a decrease in profit margin. Further, Kimemia, Namusonge and Sakwa (2018) noted that liquidity management has a positive and significant effect on financial performance of microfinance institutions. Maina (2018) indicated that liquidity management strategies positively and significantly influence sustainability of table banking groups.

Credit risk had a mean of 0.138408 units with a minimum of 0.0103 units and a maximum of 0.306683 units. The standard deviation for credit risk was 0.076067 implying that total observations were clustered around the mean. Credit risk exposure continues to be a significant basis of problems for the lending institutions including microfinance institutions. Credit risk is defined as the likelihood of loss owing to a borrower's failure to meet his obligation. Stability and profitability of a financial institution depends solely on the credit risk management practices in that institution while poor performance is attributed to weakening credit quality. Credit risk management and its effect on financial performance being the main motivation for this

study, an assumption was made that a sound credit risk management achieves satisfactory financial performance, whereas poor credit risk management leads to a lower financial performance level. Superior credit risk analysis and management presents an opportunity for MFIs to improve the overall financial stability and performance. According to Wakaria (2016) unit increase in credit risk holding other factors constant results to a unit decrease in financial performance of MFIs measured using return on equity. Further, Moseti (2015) established that credit risk management has a strong impact on the financial performance of micro finance institutions in Kenya.

Foreign exchange risk had a mean of Credit risk had a mean of 95.2063KES/1US units with a minimum of 79.09268 KES/1US and a maximum of 103.9971 KES/1US. The standard deviation for credit risk was 8.189483 KES/1US implying that total observations were clustered around the mean. Foreign exchange rate fluctuations have been a big concern to investors, analyst, managers and shareholders since the abolishment of the fixed exchange rate system of Bretton Woods in 1971. This system was replaced by a floating rates system in which the price of currencies is determined by supply and demand of money. Given the frequent changes of supply and demand influenced by numerous external factors, this new system is responsible for currency fluctuations. The exchange rate fluctuations expose companies to foreign exchange risk. Additionally, economies are getting more open with international trading constantly increasing and as a result companies become more exposed to foreign exchange rate fluctuations.

A foreign exchange exposure is the sensitivity of changes in the real domestic currency value of assets liabilities or operating incomes to unanticipated changes in exchange rate. Exchange rate fluctuations affect operating cash flows and firm value through

translation, transaction, and economic effects of exchange rate risk exposure. As Microfinance Institutions (MFIs) increasingly accept loans from foreign investors, they are faced more and more with the issue of how to handle foreign exchange risk. It is a relatively new problem for them and one with which they have little familiarity. As loans and investments from foreign sources rise, however, either the MFI or foreign investor are faced with having to handle the currency risk. But, since MFIs operate in developing countries where financial markets are underdeveloped, and because the sums involved are small, the well-established methods of the international financial markets to deal with this issue are rarely useful. According to Kihara and Muturi (2016) foreign exchange items including options, swaps and forwards were all found to have positive effect on the performance of commercial banks in Kenya. Davis, Donkoh, Mawah and Amonoo (2018) further indicated that the profitability of the microfinance banks was positively affected by foreign exchange risk.

The mean value for interest rate risk was 0.129654 with a minimum of 0.004785 and a maximum of 0.25641. The standard deviation for interest rate risk was 0.060305 implying that total observations were clustered around the mean. Interest rate risks describe the risk of expected earnings being influenced negatively as a result of changes in the pattern and level of interest rates. Interest rates are techniques adopted by lenders to ensure loans issued to customers are serviced and ensure the organization generates income to ensure efficient and effective operations. In other words, it is the impact of changing interest rates on a financial institution's margin of profits. According to Murage, Muya and Mogwambo (2018) interest rate positively affects financial performance of financial institutions. Further, Kar and Swain (2014) noted that interest rates positively and significantly impact on MFIs' financial performance and loan repayment rates.

Average of financial regulation measured using core capital was 0.435542 units with a minimum of -0.46 and a maximum of 1.971254 units. The standard deviation for core capital was 0.429125 units implying that total observations were clustered around the mean. Financial regulations are implemented in most countries to secure financial stability and to prevent systemic financial risk. Financial regulation formulated to enhance the development of the financial sector. Prudent financial regulation and supervision are considered essential in financial industry since consumers cannot monitor banks' complexity of financial products effectively. However, the fragility of financial market can be originated from inconsistent government policy which hampers the effective regulations and supervisions and leads to financial crisis. Financial regulation is the revelation of traditional philosophy of low returns on money embodied in interest rate ceilings or regulation as baseless, counterfactual, and perilous at least in the environment of the developing countries. According to Afude (2017) financial regulations influence performance s of micro finance institutions. Wanjiru (2016) further noted that capital had a positive effect on return on assets.

Descriptive results show that the mean value for return on assets was 0.277474 with a minimum of -0.42857 and a maximum of 1.658491. The variation in Standard Deviation was 0.399954, units implying that total observations were clustered around the mean. Return on Asset predicts the ratio of profits to total assets of a firm. ROA depicts the net effects of management decisions and efficiency of the company in generating income. ROA is consistently claimed to be an authentic measure of Financial Performance (Berman *et al.*, 1999). Unlike other accounting measures such as return on equity or return on sales, ROA is not affected by the differential degree of leverage present in firms. Because ROA is positively correlated with the stock price, a higher ROA implies higher value creation for shareholders. The ROA measures not only profit

aspect but also those related to assets employed to generate the profit. The outcome is consistent with Ndungu and Ngugi (2015) aver that an indication of the profitability of a firm relative to its asset base is a predictor of financial performance.

4.3 Correlation Analysis

In order to get an overview of the association between the dependent and independent variables, the researcher conducted pairwise correlation analysis. The analysis aims at testing for existence of multicollinearity and it is ideal for eliminating variables which are highly correlated. The study conducted correlation analysis between to examine the moderating effect on regulation on financial risks and the financial performance of deposit taking microfinance institutions in Kenya. Pearson's product-moment correlation coefficient (r) was used to examine the extent of correlation between the variables of study and to show the strength of the linear association between the variables. r ranges between ± 1 . Where $r = +0.7$ and above it indicates a very strong relationship; $r = +0.5$ to below 0.7 is a strong association; $r = 0.3-0.49$ is a moderate association while $r = 0.29$ and below indicates a weak association. Where $r = 0$ it indicates that there is no association. Table 4.2 shows the correlation matrix of liquidity risk, credit risk, foreign exchange risk, interest rate risk and return on assets.

Table 4.2: Correlation between financial risk and financial performance

	ROA	Liquidity risk	credit risk	Foreign risk	Interest risk
ROA	1.000				
Liquidity risk	0.5762 0.000**	1.000			
credit risk	-0.4628 0.000**	-0.3799 0.0003	1.000		
Foreign exchange risk	-0.4136 0.0001**	-0.2052 0.0551	0.2738 0.0099	1.000	
Interest rate risk	0.372 0.0004**	0.2621 0.0136	-0.2563 0.0159	-0.2063 0.0538	1.000

*Significant at 0.05

**Significant at 0.01

The correlation results found that liquidity risk and financial performance of microfinance institutions are positively and significantly associated ($r=0.5762$, $p=0.000<0.05$). The results imply that liquidity and financial performance move in different direction. The amount of liquidity demanded is determined by the level of income: the higher the income, the more money demanded for carrying out increased spending. The precautionary motive, people prefer to have liquidity in the case of social unexpected problems that need unusual costs.

MFI's ability to meet its liquidity needs depends on whether it has stock that are easily transferable or has high liquid altogether. Transferability together with liquidity, therefore, becomes an integral component for transactions. Liquidity needs therefore implies that a financial asset should be at owners disposal within the short while. The transferability threshold requires that financial asset should be portable, be par and be in the form readily acceptable by other relevant parties. Liquidity risk control is an obligatory factor of the general risk mitigation charter for all financial institutions. Customer deposits may offer an innate cushion against liquidity risk in micro finance institutions. Liquidity risk is positively correlated to Net Interest Margin; a suggestion

that financial institution with substantial liquidity levels receive greater interest revenue. Decreases MFI liquidity and at the same time company will not be able to generate income from productive areas.

The results agree with Sufian and Kamarudin (2011) liquidity levels significantly affect the bank's profitability this is consistent with (Dang, 2011) who found that adequate level of liquidity is positively related with bank profitability. The results however, do not agree with Lemara (2017) who indicated that there was insignificant relationship between liquidity and performance of deposit taking micro finance institutions in Kenya. Also, Umar, Muhammad, Asad and Mazhar (2015) in their study on impact of liquidity risk management on firms' performance in the conventional banking of Pakistan indicated that current ratio was negative and significant to performance.

The results found that credit risk measured using non-performing loans and financial performance of microfinance institutions are negatively and significantly associated ($r=-0.4628$, $p=0.000<0.05$). The results imply that credit risk measured using non performing loans and financial performance move in the inverse direction. Credit risk is essential in optimizing the performance of financial institutions. Credit risk is the potential change in net asset value due to changes in the perceived ability of counterparties to meet their contractual obligations. Credit risk arises from non-performance by a borrower by either inability or unwillingness to perform in the pre-committed contracted manner. This affects the lender holding the loan contract as well as other lenders to the creditor. Therefore the financial condition of the borrower as well as the current value of any underlying collateral is of considerable interest to its credit union. The deviation of portfolio performance from its expected value result to real credit risks that faces the financial institutions. Credit risk is hard to eliminate but

it can be diversified because a portion of the default risk may result from the systematic risk. It can occur when the member in microfinance is unable to pay or cannot pay on time. There can be many reasons for default.

However, the results do not agree with Korir (2010) that there is a positive relationship between credit risk management practices and the financial performance of Deposit taking microfinance institutions. Moreover, Rasika and Sampath (2015) indicated a positive effect of credit risk and the financial performance Commercial Banks in Sri Lanka. However, King'ori, Kioko and Shikumo (2017) found an insignificant negative relationship between liquidity risk, credit risk and financial performance of microfinance banks in Kenya. Further, Imamul and Arif (2015) credit risk has a positive and significant effect on the financial performance of Indian Commercial Banks.

The results found that foreign exchange risk and financial performance of microfinance institutions are negatively and significantly associated ($r=-0.4136$, $p=0.0001<0.05$). Foreign exchange is the process of trading one currency for another. MFIs lend in local currencies but receive investor or donor contributions in foreign currencies. Therefore, parties to such transactions are exposed to foreign exchange risk through the process of debt servicing. Mechanisms for hedging such exposure are clearly required. While foreign exchange risk hedging is by no means a new concept and one that the mainstream international financial markets are well equipped to handle, when it comes to microfinance it is a relatively new issue. However, foreign exchange rate risk arises from unexpected changes in currency rates, the potential loss that results from a change in the value of a currency. During lending, the risk arises from the possibility of a change in the currency in which the loan is denominated. This situation exists because in the time between when a loan is initially made and loan

payments are necessary, exchange rates between the borrowing country and the lending country can and generally do change. Hence, foreign exchange risk for one of the involved parties and the necessity for the parties involved to hedge against the risk of an adverse foreign exchange rate shift. When dealing with foreign exchange risk there are various options that are available for those who are exposed to foreign exchange risk including hedging strategy.

According to James, Ted and Sorin (2011) the market price of foreign exchange risk was found to have negative relationship with stock returns. However, the results do not agree with Mwangi (2013) that who found out that a strong positive relationship exists between financial performance in terms of ROA and use of forward contracts and options as foreign exchange risk management techniques. Further, Davis, Donkoh, Mawah and Amonoo (2018) indicated that the profitability of the microfinance banks was positively affected by foreign exchange risk as the case of Akuapem Rural Bank.

It was also established that interest rate risk financial performance of microfinance institutions are positively and significantly associated ($r=0.372$, $p=0.004<0.05$). The results imply that interest rate risk and financial performance move in the same direction. Interest rate is the price a borrower pays for the use of money they borrow from a lender or fees paid on borrowed assets. Interest rate can be thought of as rent of money. Interest rates are fundamental to a capitalist society and are normally expressed as a percentage rate over the period of one year. Interest rate as a price of money reflects market information regarding expected change in the purchasing power of money or future inflation. The results agree with Wamutitu (2014) who found that interest rate affect ROE in Microfinance institutions as it increases the cost of loans charged on the borrowers, regulation on interest rates have far reaching effects on ROE. However,

Gweyi, and Karanja (2014) interest rate risk has a negative and significant influence on financial performance. The results also align with Kathomi, Maina and Kariuki (2017) who established that changes in interest rates by the government affected sustainability of MFIs.

4.4 Diagnostic Tests

4.4.1 Fisher-type test of unit root

In view of the fact that panel data have both cross-sections and time series dimensions, there is need to test for stationarity of the time series because the estimation of the times series is based on the assumption that the variables are stationary. Estimating models without taking into account the non-stationary nature of the data would lead to unauthentic results (Gujarati, 2003). The study employed Fisher-type test in testing the stationarity of the data. Stationarity results are presented in Table 4.3. The hypotheses to be tested were;

Ho: All panels contain unit roots

Ha: At least one panel is stationary

Table 4.3: Fisher-type test of unit root

Variable		Inverse chi-squared(70) P	Inverse normal Z	Inverse logit t(179) L*	Modified inv. chi-squared Pm
Liquidity risk	test				
	statistic	113.5311	-5.3279	-7.8897	12.1384
	p-value	0.000	0.000	0.000	0.000
Credit risk	test				
	statistic	106.6455	-5.8327	-7.6867	11.1835
	p-value	0.000	0.000	0.000	0.000
D(foreign exchange risk)	test				
	statistic	70.2519	-5.4742	-6.2944	6.1366
	p-value	0.000	0.000	0.000	0.000
Interest rate risk	test				
	statistic	102.3354	-2.7791	-5.8661	10.5858
	p-value	0.000	0.0027	0.000	0.000
Financial regulation (core capital)	test				
	statistic	66.1743	-4.1814	-4.4857	5.5712
	p-value	0.000	0.000	0.000	0.000
ROA	test				
	statistic	70.3677	-3.8902	-3.94	6.1527
	p-value	0.0000	0.0001	0.0001	0.0000

The stationarity results test for unit root revealed that, at level liquidity risk, credit risk, interest rate risk and return on assets were stationary since $p\text{-value} < 0.05$ at P, Z, L* and Pm. This means that the results obtained are now not spurious (Gujarati, 2003) and so panel regression models could be generated. However, at level foreign exchange risk was not stationary and so first differencing was undertaken to make it stationary.

4.4.2 Hausman Test

When performing panel data analysis, one has to determine whether to run a random effects model or a fixed effects model (Baltagi, 2005). In order to make a decision on the most suitable model to use, both random and fixed effects estimate coefficients. The study used the Hausman's specification test (1978) to choose between fixed and random effect models. Table 4.4 shows the results of Hausman test.

H_0 : Random effect is appropriate

H_1 : Fixed effect is appropriate

Table 4.4: Hausman Random Test for random and fixed effects

ROA	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Liquidity risk	0.334823	0.267627	0.067196	0.045957
Credit risk	-0.8381	-0.75592	-0.08219	0.326125
Foreign exchange risk	-0.01518	-0.01616	0.000977	0.001696
Interest rate risk	0.091391	0.255495	-0.1641	0.22262
chi2(4)	2.37			
Prob>chi2	0.6674			

Source: Stata 14 computations

The null hypothesis of the Hausman test is that the random effects model is preferred to the fixed effects model. Hausman test revealed a chi-square of 2.37 with a p-value of 0.6674 indicating that at 5 percent level, the chi-square value obtained is statistically insignificant. Thus, the researcher does not reject the null hypothesis that random effects model is preferred to fixed effect model for the model. The study concludes that random effect is appropriate model when to examining the moderating effect on regulation on financial risks and the financial performance of deposit taking microfinance institutions in Kenya.

4.4.3 Normality Test

The normality assumption ($ut \sim N(0, \sigma^2)$) was required in order to conduct single or joint hypothesis tests about the model parameters (Brooks, 2008). Table 4.5 shows the normality results using for Skewness and Kurtosis test for the financial firms. Bera and Jarque (1981) tests of normality were performed. If the p-value is less than 0.05, the null of normality at the 5% level is rejected. If the data is not normally distributed a nonparametric test was most appropriate. The study tested the null hypothesis that the disturbances are not normally distributed.

H₀: The data are not normally distributed

H₁: The data are normally distributed

Table 4.5: Normality Test

Variable	Observation	Skewness	Kurtosis	P-value
ROA	88	2.2952	0.8061	0.5041
Liquidity risk	88	1.4740	0.4608	0.2963
Credit risk	88	3.8629	0.9274	0.3095
Foreign exchange risk	88	2.0155	0.2480	0.4915
Interest rate risk	88	1.2801	0.6373	0.7045
Financial regulation (core capital)	88	2.4598	0.5457	0.6379

Table 4.4 shows the normality results using for skewness and Kurtosis test. The P-values were higher than the critical 0.05 and thus we conclude that the data is normally distributed.

4.4.4 Multicollinearity Test

According to William *et al.* (2013), multicollinearity refers to the presence of correlations between the predictor variables. In severe cases of perfect correlations between predictor variables, multicollinearity can imply that a unique least squares solution to a regression analysis cannot be computed (Field, 2009). Multicollinearity inflates the standard errors and confidence intervals leading to unstable estimates of the coefficients for individual predictors (Belsley *et al.*, 1980). Multicollinearity was assessed in this study using the variance inflation factors (VIF). According to Field (2009) VIF values in excess of 10 is an indication of the presence of Multicollinearity. The results in Table 4.6 indicated absence of multicollinearity since the VIF of all the variables were less than 10.

Table 4.6: Multicollinearity Test

Variable	VIF	1/VIF
Liquidity risk	1.35	0.743091
Credit risk	1.34	0.7458
D (Foreign exchange risk)	1.36	0.732958
Interest rate risk	1.18	0.843891
Mean VIF		1.31

The results in Table 4.6 indicated absence of multicollinearity since the VIF of all the variables were less than 10. When multicollinearity was tested, the VIF values for liquidity risk, credit risk, foreign exchange risk and interest rate risk were less than 10 indicating absence of multicollinearity. Level of multicollinearity being low is the desired information since presence of multicollinearity in data is not acceptable given that it undermines the statistical significance of the independent variable. Severe multicollinearity is not good for the model either.

4.4.5 Autocorrelation Test

Serial correlation test was conducted to check for correlation of error terms across time periods. This study used the Wooldridge test for serial correlation to test for the presence of autocorrelation in the linear panel data. Serial autocorrelation is a common problem experienced in panel data analysis and has to be accounted for in order to achieve the correct model specification. The test tested for the following hypotheses. The results are presented in Table 4.7.

H_0 : Residuals of this regression model does not have serial correlation

H_1 : Residuals of this regression model have serial correlation

Table 4.7: Serial Correlation Tests

Wooldridge test for autocorrelation in panel data

H₀: no first-order autocorrelation

F(1, 12) = 0.830Prob > F = 0.3801

Source: Research Data, 2020

The null hypothesis of this test was that there is no first order serial/autocorrelation existed in the data. When Serial Correlation was conducted, the test statistic reported is F-test of 0.830 and a p value of 0.3801 >0.05. The null hypothesis that no first order serial /auto correlation exists is not rejected. We then conclude that serial correlation does not exist. If the serial correlation is detected in the panel data, then the Feasible Generalized Least Squares (FGLS) estimation is adopted.

4.4.6 Heteroscedasticity

White's test was used to test for heteroskedasticity. The null hypothesis in the test is that error terms have a constant variance (i.e. should be Homoskedastic). The heteroskedasticity results are presented in Table 4.8

Table 4.8: Breusch-Pagan test for Heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of ROA

chi2(1) = 3.78

Prob> chi2 = 0.0519

The results in the Table 4.8 indicate that the error terms are heteroskedastic, given that the p-value (0.0519>0.05) confirmed that the null hypothesis of constant variance was

accepted justifying the absence of heteroskedasticity in the data as indicated by Poi and Wiggins (2001).

4.5 Panel Regression Analysis Results and hypothesis testing

The study sought to carry out panel regression analysis to establish the statistical significance relationship between the independent variables that is liquidity risk, credit risk, foreign exchange risk and interest rate risk on financial performance of microfinance institutions in Kenya measured using return on assets. According to Rencher and Schaalje (2009), regression analysis is a statistical process of estimating the relationship among variables. It includes many techniques for modeling and analysing several variables, when the focus is on the relationship between a dependent and one or more independent

Regression analysis helps one to understand how the typical value of the dependent variable changes when any one of the independent variable is varied, while the other independent variables are held fixed (Baltagi, 2005). On the same note, Wan (2013) contends that regression analysis helps in generating an equation that describes the statistical relationship between one or more predictor variables and the response variable.

4.5.1 Panel Regression of the Effect of Financial Risks on Financial Performance of Micro Finance Institutions

An overall panel regression analysis was conducted between financial risk (liquidity risk, credit risk, foreign exchange risk and interest rate risk) and financial performance of microfinance institutions in Kenya. According to Rencher and Schaalje (2009), regression analysis is a statistical process of estimating the relationship among variables. It includes many techniques for modelling and analysing several variables,

when the focus is on the relationship between a dependent and one or more independent variables. More specifically, regression analysis helps one to understand how the typical value of the dependent variable changes when any one of the independent variable is varied, while the other independent variables are held fixed. In addition, Wan (2013) contends that regression analysis helps in generating an equation that describes the statistical relationship between one or more predictor variables and the response variable. Panel regressions for the financial risk and financial performance of microfinance institutions measured using ROA as shown in Table 4.9. The hypotheses were tested using p-value method in the panel model. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H_0 but if it's less than 0.05 level of significance, the H_0 is rejected.

Table 4.9: Panel Model on the Effect of financial risk and financial performance (ROA)

ROA	Coef.	Std. Err.	z	P>z
Liquidity risk	0.336584	0.07157	4.7	0.000**
Credit risk	-0.78296	0.344563	-2.27	0.023*
D(foreign exchange risk)	-0.01059	0.003634	-2.91	0.004**
Interest rate risk	0.558724	0.283753	1.97	0.049*
_cons	1.105163	0.351467	3.14	0.002**
R-sq:				
within	= 0.5083			
between	= 0.5231			
overall	= 0.4883			
Wald chi2(4)	79.20			
Prob > chi2	0.000			

*Significant at 0.05

**Significant at 0.01

The regression model was;

$$ROA = 1.105163 + 0.336584 \text{Liquidity risk} - 0.78296 \text{Credit risk} - 0.01059 \text{D(Foreign exchange risk)} + 0.558724 \text{Interest rate risk}$$

The R squared was used to check how well the model fitted the data. The study was supported by coefficient of determination R square of 0.4883. This means that liquidity risk, credit risk, foreign exchange risk and interest rate risk explain 48.83% of the variations in the performance of microfinance institutions. A good performance in microfinance is vital in sustaining the stability of the firm. Poor financial performance deteriorates the capacity of MFIs to absorb negative shocks, which subsequently affect solvency (Almazari, 2011). Financial performance is the measure of organizations achievement on the goals, policies and operations stipulated in monetary terms. It involves the financial health and can be compared between similar firms in the same industry (Adhikary, 2014). The performance of micro finance institution is dependent on financial risk management. Financial risk management has become a significant part of firm management after the financial crisis in 2007 and 2008. The business environment is enmeshed with financial risks which can have a negative impact on an organization existence and success (Anas & Fauziah, 2014). Firms have recognized the significance and necessity of managing risks and the importance of doing this in a more coordinated way by considering both internal and external environment to adequately understand and manage these risks. This way they avoid possible financial losses and damage to company reputation (Davis, Donkoh, Mawah, & Amonoo, 2018). Firms that fail to manage risk, fail to maximize on the opportunities that risky environment present to them for their own competitive advantage.

The results revealed that there was a positive and significant relationship between liquidity risk and return on assets of micro financial institutions ($\beta = 0.336584$, $p = 0.000 < 0.05$). This was supported by a calculated z-statistic of 4.7 that if liquidity risk is increased by one unit, the financial performance of Microfinance Institutions increases by 0.336584 units. This implies that a unit change in liquidity is related with a change in return on assets. The first hypothesis (H_1) was that there is no significant effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya. The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H_0 but if it's less than 0.05 level of significance, the H_0 is rejected. Results in Table 4.9 shows that liquidity risk and financial performance of Microfinance Institutions are positively and significantly related with p value = 0.000 < 0.05. The null hypothesis was therefore rejected and concluded that there is a significant effect of liquidity risk on financial performance of Microfinance Institutions in Kenya.

Liquidity position is therefore a paramount aspect of institution performance since it impacts on profitability. Illiquid micro finance institution may render a financial institution incapable of meeting the short term demands of their customers in timely manner. The customers of the financial institutions include the depositors and the investors. MFIs may create liabilities through savings from depositors and assets through giving loans to investors. However, when depositors make small savings in short terms and MFIs lend much to investors in long term, the financial institution may be exposed to liquidity risks. Liquidity risk is a risk arising from a firm's inability to meet its obligations when they come due without incurring unacceptable losses. In this regard, liquidity risk can be expressed as the probability of incurring losses through

insufficient liquid resources to comply with the institutional payment obligations within a certain time horizon, and having considered the possibility of the entity managing to liquidate its liquid assets in reasonable time without losing its value. This risk can adversely affect MFIs earnings and the capital and it may face serious consequences if it is not properly managed.

Liquidity risk can be viewed in two perspectives; funding liquidity risk and market liquidity risk. Funding liquidity risk arises when a financial institution is unable to meet its obligations as they come due because of an inability to liquidate assets or obtain adequate funding. Market liquidity risk arises when an institution cannot easily unwind or offset specific exposures without significantly lowering market prices because of inadequate market depth or market disruptions. Prudent risk management is therefore paramount for every enterprise for its operations. Financial institutions may also face Liquidity risk through sales of its liquid assets.

The results agree with Song'e (2015) that financial performance as measured by profit before tax over total assets is positively related to Liquidity. However, the results are in not in line with Gweyi, Olweny and Oloko (2016) liquidity risk has a negative and significant influence on financial performance. King'ori, Kioko and Shikumo (2017) found an insignificant negative relationship between liquidity risk and financial performance of microfinance banks in Kenya. According to Anas and Fauziah (2014) liquidity risk has positive relationship with (ROA) but not significant, hence not regarded as absolute determinant of fully-fledged Islamic bank profitability.

There was a negative and significant relationship between credit risk and performance of micro financial institutions measured using return on assets ($\beta = -0.01059$, $p = 0.023 < 0.05$). This was supported by a calculated z-statistic of 2.27 that is larger than

the critical z-statistic of 1.96. The regression of coefficient implies that if credit risk (non-performing loans) is increased by one unit, the financial performance of Microfinance Institutions in Kenya reduces by -0.78296 units. This implies that change in the state of change credit risk has a significant influence on financial performance of micro financial institutions. The second hypothesis (H_2) was that there is no significant relationship between credit risk and financial performance of Microfinance Institutions in Kenya. The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H_{02} but if it's less than 0.05 level of significance, the H_{02} is rejected. Results in Table 4.9 shows that credit risk and financial performance of Microfinance Institutions are negatively and significantly related with p value=0.023<0.05. The null hypothesis was therefore rejected and concluded that there is a significant effect of credit risk on financial performance of Microfinance Institutions in Kenya.

Credit risk is a particular concern for MFIs because most micro lending is unsecured that is traditional collateral is not often used to secure microloans. Credit risk is the financial loss that a lender will suffer because of a borrower's failure to perform according to the terms and conditions of the credit or loan agreement. Credit risk involves screening clients to ensure that they have the willingness and ability to repay a loan. Effective management of credit risk through proper management results in the improvement of earnings and reduces insolvency. Credit risk affects the profitability and the general performance of any financial institution and is one of the major risks to microfinance institutions sustainability. Thus, managing credit risk is an integral part of microfinance bank operating techniques, with reducing the risks requiring a major operational effort.

The results agree with Olugboyega, Babatunji, Jayeola and Tobi (2018) who revealed that credit risk measured using non-performing loans ratio has a negative but significant relationship with ROA and ROE. However, Kalu, Shieler and Amu (2018) indicated that credit risk identification and credit risk appraisal has a strong positive relationship on financial performance of MDIs, while credit risk monitoring and credit risk mitigation have moderate significant positive relationship on financial performance of microfinance deposit taking institutions. Gatuhu (2013) further established that client appraisal, credit risk control and collection policy significantly influence financial performance of MFIs in Kenya. However, according to King'ori *et al.* (2017) credit risks do not have statistically significant relationship with financial performance of microfinance banks of the Kenya.

Further, the results revealed that there was a negative and significant relationship between foreign exchange risk and performance of micro financial institutions measured using return on assets ($\beta = -0.78296$, $p = 0.004 < 0.05$). This was supported by a calculated z-statistic of 2.91 that is larger than the critical z-statistic of 1.96. The regression of coefficient implies that if foreign exchange risk is increased by one unit, the financial performance of Microfinance Institutions in reduces by 0.78296 units. This implies that foreign exchange risk has an adverse effect on financial performance of micro financial institutions. The third hypothesis (H_{03}) was that there is no significant relationship between foreign exchange risk and financial performance of Microfinance Institutions in Kenya. The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H_{03} but if it's less than 0.05 level of significance, the H_{03} is rejected. Results in Table 4.9 shows that foreign exchange risk and financial performance of Microfinance Institutions are negatively and significantly related with

p value=0.004<0.05. The null hypothesis was therefore rejected and concluded that there is a significant effect of foreign exchange risk on financial performance of Microfinance Institutions in Kenya.

MFIs that have contracted commercial loans in foreign currencies are likely to be hit quite hard, due to foreign exchange losses. Foreign exchange exposure refers to the sensitivity of a firm's cash flows, real domestic currency value of assets, liabilities, or operating incomes to unanticipated changes in exchange rates. MFIs must lend these funds in their local currency, immediately creating foreign exchange rate risk. Furthermore, these institutions operate primarily in developing countries where the risk of local currency devaluation is the highest. These risks prevent access to many potential funding sources, including debt capital. Foreign exchange risk management remains a significant problem for any international financial institution, but the problem is much greater for MFIs that are forced to borrow abroad and operate in an unstable economic environment, preventing access to many potential funding sources.

MFIs must understand how to measure the exposure to exchange rate fluctuations so that they can determine whether and how to protect MFI from such exposure. Foreign exchange rate movements could be an important source of risk for banking institutions. In the worst case, large foreign exchange losses could lead to MFI failures. Foreign exchange losses could cause huge burdens on MFIs' profitability. The results are in line with Ahmed (2015) that foreign exchange exposure has negative effect on the performance of listed commercial banks in Kenya. Further, Omar (2014) noted that there is inverse relationship of foreign exchange costs and payable to the net income and direct relationship to the net loss of the financial institutions operating in Zanzibar.

In China, Xiangnan, and Xin (2012) found that foreign exchange risk was negatively correlated to stock returns of Chinese bank.

The study also revealed that there was a positive and significant relationship between interest rate risk and performance of micro financial institutions measured using return on assets ($\beta=0.558724$, $p=0.049<0.05$). This was supported by a calculated z-statistic of 1.97 that is larger than the critical z-statistic of 1.96. The regression of coefficient implies that if interest rate risk is increased by one unit, the financial performance of Microfinance Institutions in increase by 0.558724 units. This implies that interest rate risk has a positive effect on financial performance of micro financial institutions. The fourth hypothesis (H_{04}) was that there is no significant relationship between interest rate risk and financial performance of Microfinance Institutions in Kenya.

The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H_{04} but if it's less than 0.05 level of significance, the H_{04} is rejected. Results in Table 4.9 shows that interest rate risk and financial performance of Microfinance Institutions are positively and significantly related with p value= $0.049<0.05$. The null hypothesis was therefore rejected and concluded that there is a significant effect of interest rate risk on financial performance of Microfinance Institutions in Kenya.

Interest rate is an important tool of monetary policy when dealing with microfinance institutions. Interest rate charged on loans advanced is one of main determinant of financial performance of financial institutions. Interest rate is seen as the price lenders expect (or in this case, the borrowers pay) for exchanging current claims for greater future claims to goods and services. Interest rates therefore represent cost of money. Non-Interest income forms another source of the institutions' income, which includes

service charge on deposits (that is, payments for the services provided by the institution and include charges on: opening of accounts, banker's cheque processing, salary processing, loan processing, commission, account closing among others) and income from other non-deposit activities. The level of Non-Interest expenses affects the rate of profitability of financial institutions.

The differences in the mix of an institution's activities have an impact on spreads and profitability. The lending interest rates should enable MFIs to provide sustainable financial services to large numbers of poor clients while being independent of any form of subsidy. The results agree with Aykut (2016) showed interest rate risk had a statistically negative and significant effect on the volatility of bank profitability. Kathomi, Maina, and Kariuki (2017) further found that there was statistically and significant negative effect of lending rates on sustainability of MFIs. This means that increasing the interest rate reduces the return thus rendering the MFIs unsustainable.

4.6 Moderating Effect of Financial regulations on Financial Risks and Financial Performance of Microfinance Institutions

The fifth objective of the study was to examine the moderating effect of financial regulations on the relationship between financial risks and the financial performance of deposit taking microfinance institutions in Kenya. The results presented in Table 4.10 shows model the fitness for a regression model after moderation.

Table 4.10: Regression of Coefficients after Moderation

ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Liquidity risk	0.148285	0.105474	1.41	0.16	-0.05844	0.355009
Credit risk	-1.21277	0.513846	-2.36	0.018*	-2.21989	-0.20565
Foreign exchange risk	-0.01058	0.003646	-2.9	0.004**	-0.01773	-0.00343
Interest rate risk	1.643182	0.662841	2.48	0.013*	0.344037	2.942327
Liquidity risk*M	0.236554	0.100755	2.35	0.019*	0.039079	0.43403
Credit risk*M	0.460164	0.538306	0.85	0.393	-0.5949	1.515224
d.foreign exchange risk*M	-0.89853	0.46439	-1.93	0.053	-1.80871	0.011662
Interest rate risk*M	-0.92948	0.410748	2.826	0.013*	-1.89133	0.032366
_cons	1.069164	0.358238	2.98	0.003**	0.36703	1.771298
R-sq: within	= 0.5587					
between	= 0.5476					
overall	= 0.5387					
Wald chi2(4)	92.25					
Prob > chi2	0.0000					

***Significant at 0.05**

***Significant at 0.01**

M=moderator/financial regulation (core capital)

$$ROA = 1.069164 + 0.148285Liquidity\ risk - 1.21277Credit\ risk - 0.01058Foreign\ exchange\ risk + 1.643182Interest\ rate\ risk + 0.236554Liquidity\ risk * M + 0.460164Credit\ risk * M - 0.89853Foreign\ exchange\ risk * M - 0.92948Interest\ rate\ risk * M$$

The relationship between liquidity risks is positive but insignificantly related to performance of micro financial institutions. However, when liquidity risks was interacted with financial regulation, the relationship between liquidity risks and performance of micro financial institutions was positive and statistically significant ($\beta=0.236554$, $p=0.019<0.05$). Liquidity risk arises when a microfinance bank is unable to meet its cash requirements or payment obligations timely and in a cost-efficient

manner. MFI with inadequate liquidity might be less immune towards future uncertainty, timely delay of refinancing, disruption in meeting growth projections and increased portfolio at risk. To reduce liquidity risk, each microfinance institution branch needs to prepare a daily fund plan that guides the matching of cash inflows from loan repayment and saving deposits with cash outflows for the branch on a daily basis.

The relationship between credit risks is negative and statistically significant with performance of micro financial institutions before interacting the relationship with financial regulations ($\beta=-1.21277$, $p=0.018<0.05$). However, when credit risks was interacted with financial regulation, the relationship between credit risks and performance of micro financial institutions was positive but statistically insignificant ($\beta=0.460164$, $p=0.393>0.05$). It was further revealed that the relationship between foreign exchange risks is negative and statistically significant with performance of micro financial institutions before interacting the relationship with financial regulations ($\beta=-0.01058$, $p=0.004<0.05$). However, when foreign exchange risks was interacted with financial regulation, the relationship between foreign exchange risks and performance of micro financial institutions became negative and statistically insignificant ($\beta=-0.89853$, $p=0.053>0.05$). Finally, it was found that the relationship between interest rate risks is positive and statistically significant with performance of micro financial institutions before interacting the relationship with financial regulations ($\beta=1.643182$, $p=0.013<0.05$). Likewise, when interest rate risks was interacted with financial regulation, the relationship between foreign exchange risks and performance of micro financial institutions became negative but statistically significant ($\beta=-0.92948$, $p=0.013<0.05$).

The model further showed that liquidity risk, credit risk, foreign exchange risk and interest rate risk moderated by financial regulation to examine the relationship between financial risks and the financial performance of deposit taking microfinance institutions in Kenya was satisfactory. The R^2 of the model summary before moderation was 48.83% but after moderation the R^2 improved to 53.87%. This implies that financial regulations enhance the performance of microfinance institutions. The fifth hypothesis (H_5) was that financial regulations do not moderate the relationship between financial risk and financial performance of deposit taking Microfinance Institutions in Kenya.

Financial regulation is a form of supervision that subjects financial institutions to requirements, restrictions, and guidelines that aim to maintain the integrity of the financial sector. Regulation is done to maintain market confidence, protect financial stability, protect consumers, and regulate foreign participation in the financial markets. Financial regulation allows for a well-structured financial system. This financial system is able to carry out supervisory, governance, risk-taking practices that allow the better financial performance as well as economic stability in sections of the economy. Governments and regulatory bodies ensure that a country is able to experience tangible financial performance which is difficult because most countries experience corruption issues and policy formulation and implementation irregularities.

Financial institutions are required to follow certain rules and guidelines that ensure integrity is maintained within the financial system. These regulations influence the financial sector structure working for the benefit of the clients. These regulations ensure that borrowing costs are lowered while the available financial products are increased. Further, financial regulations form policies that act as guidelines for organizations. These are laws that MFIs must abide to ensure a state of integrity and accountability.

These regulations ensure that the MFIs experience cash flow that is adequate to prevent bankruptcy by limiting out flow of cash. Credibility of MFIs brings forth clientele that ensures continuous cash flow for the stability of the overall economy. Thus, micro finance institutions must be structured in compliance with the financial regulations provided by the government. This is because only licensed financial institutions can provide services in most countries.

While regulation ensures that MFIs are financially sustainable, compliance compels them to make large-sized loans to wealthy clients in order to reduce the risk of lending and minimise administrative costs, a situation that compromises their main goal of reaching out to the poor. On the other end, regulations enable formal MFIs to mobilize voluntary savings from the public for on-lending to clients, an opportunity not available to informal MFIs. The impact of regulation on the ability of MFIs to serve the poor is an important area of study if MFIs are to remain financially sustainable as well as play a role in poverty alleviation. The results agree with Quartey and Kotey (2019) results showed that regulations increased the client base of MFIs but reduced the percentage of poor clients served. According to Pouchous, (2012) blindly extending domestic prudential rules and consumer protection laws will not work. Specific adjustments will be necessary to capture the specificities of microfinance activities, both in the field of prudential and non-prudential regulation.

Regulators will also have to weigh the potential costs of regulation and supervision, including the potential unintended consequences of regulation, particularly in regard to innovation and competition. Regarding supervision, adequate oversight mechanisms are critical for the proper framing of microfinance activity, but, like regulation, these

measures have costs, both for public authorities and microfinance institutions. Such costs must be realistically estimated and sustainably supervised.

4.7 Discussion of Hypotheses

Hypotheses were tested using p-values. The criterion was to reject null hypothesis if the p value calculated is less than the critical p value of 0.05. The first hypothesis (H₁) that there is no significant effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya was rejected and concluded that there is a positive significant relationship between liquidity risk and financial performance of Microfinance Institutions in Kenya. The second hypothesis (H₂) that there is no significant effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya was also rejected and concluded that there is a negative significant relationship credit risk and financial performance of Microfinance Institutions in Kenya.

Further, the third hypothesis (H₃) that there is no significant effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya was rejected and concluded that there is a negative significant relationship between foreign exchange risk and financial performance of Microfinance Institutions in Kenya. Moreover, the fourth hypothesis (H₄) that there is no significant effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya was therefore rejected and concluded that there is a positive significant relationship between interest rate risk and financial performance of Microfinance Institutions in Kenya. Finally, the fifth hypothesis (H₅) that there is no significant moderating effect of financial regulations on the relationship between financial risks and the financial performance of deposit taking microfinance institutions in Kenya was also rejected and

concluded that financial regulations moderate the relationship between financial risk and financial performance of deposit taking microfinance institutions in Kenya.

The summary of results of hypotheses are presented in Table 4.11

Table 4.11 Summary of hypotheses

Objective No	Objective	Hypothesis	Rule	p-value	Comment
Objective 1	To examine the effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya.	H ₀₁ : There is no significant effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya.	Reject H ₀₁ if p value <0.05	p<0.05	The result fails to accept the hypothesis; therefore, there is a significant relationship between liquidity risk and financial performance of Microfinance Institutions in Kenya.
Objective 2	To examine the effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya	H ₀₂ : There is no significant effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya.	Reject H ₀₂ if p Value <0.05	p<0.05	The result fails to accept the hypothesis; therefore, there is a significant relationship between credit risk and financial performance of Microfinance Institutions in Kenya.
Objective 3	To examine the effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya.	H ₀₃ : There is no significant effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya.	Reject H ₀₃ if p value <0.05	p<0.05	The result fails to accept the hypothesis; therefore, there is a significant relationship between foreign exchange risk and financial performance of Microfinance Institutions in Kenya
Objective 4	To examine the effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya	H ₀₄ : There is no significant effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya.	Reject H ₀₄ if p Value <0.05	p>0.05	The result fails to accept the hypothesis; therefore, there is a significant relationship between interest rate risk and financial performance of Microfinance Institutions in Kenya
Objective 5	To examine the moderating effect of financial regulations on the relationship between financial risks management strategies and the financial performance of deposit taking microfinance institutions in Kenya	H ₀₅ : There is no significant moderating effect of financial regulations on the relationship between financial risks management strategies and the financial performance of deposit taking microfinance institutions in Kenya.	Reject H ₀₅ if p value <0.05	p<0.05	The results fail to accept the hypothesis; therefore, financial regulations moderates the relationship between financial risks and financial performance of Microfinance Institutions in Kenya

Source: Researcher's compilation 2021

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the findings in line with the objectives of the study, conclusions drawn and the necessary recommendations made for the study including suggested areas of further study to enrich relevant knowledge under the study.

5.2 Summary of Findings

The general objective of this study was to examine the moderating role of financial regulation on financial risks and the financial performance of deposit taking microfinance institutions in Kenya. The study objectives are to examine the effect of liquidity risk, credit risk, foreign exchange risk and interest rate risk on financial performance of microfinance institutions in Kenya. The study also determined the moderating effect of financial regulation using core capital requirement on financial risks and the financial performance of deposit taking microfinance institutions in Kenya.

The study employed explanatory research design that sets out to explain and account for the descriptive and inferential information of the population. Pearson correlation was used to establish the association between the independent variables and the dependent variable and it was found that liquidity risk and interest rate risk have a positive and significant association with financial performance of microfinance institutions. Credit risk and foreign exchange risk have a positive and significant association with financial performance of microfinance institutions. Panel model was employed to test the hypotheses of the study.

5.2.1 Liquidity risks

The first objective of the study was to examine the effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya. Correlation analysis showed there was a positive and significant association between liquidity risk and financial performance of deposit taking microfinance institutions. Regression analysis indicated that liquidity risk and financial performance of deposit taking microfinance institutions have a positive and significant relationship. Liquidity risk control is an obligatory factor of the general risk mitigation charter for all financial institutions. The first hypothesis (H_{01}) that there is no significant effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya was therefore rejected and concluded that there is a significant relationship between liquidity risk and financial performance of Microfinance Institutions in Kenya. Liquidity is the ability of an organisation to have funds to meet their current liabilities as they fall due and the ability to meet increasing loan demands. Liquidity determines financial health of a business or personal investment portfolio. According to Ongaki (2016), there is a negative relationship between profit ratio and liquidity ratio and an increase in liquidity ratio leads to a decrease in profit margin. Further, Kimemia, Namusonge and Sakwa (2018) noted that liquidity management has a positive and significant effect on financial performance of microfinance institutions. Maina (2018) indicated that liquidity management positively and significantly influence sustainability of table banking groups.

5.2.2 Credit risk

The second objective of the study was to examine the effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya. Correlation analysis showed there was a negative and significant association between credit risk and financial performance of microfinance institutions. Regression analysis indicated that credit risk and financial performance of microfinance institutions have a negative and significant relationship. Credit risk is the potential change in net asset value due to changes in the perceived ability of counterparties to meet their contractual obligations. Credit risk arises from non-performance by a borrower by either inability or unwillingness to perform in the pre-committed contracted manner. The second hypothesis (H_{02}) that there is no significant effect of credit risk on the financial performance of microfinance institutions in Kenya was therefore rejected and concluded that there is a significant relationship between credit risk and financial performance of Microfinance Institutions in Kenya. Credit risk is the potential change in net asset value due to changes in the perceived ability of counterparties to meet their contractual obligations. Credit risk arises from non-performance by a borrower by either inability or unwillingness to perform in the pre-committed contracted manner. However, King'ori, Kioko and Shikumo (2017) found an insignificant negative relationship between liquidity risk, credit risk and financial performance of microfinance banks in Kenya. Further, Imamul and Arif (2015) credit risk has a positive and significant effect on the financial performance of Indian Commercial Banks.

5.2.3 Foreign exchange risk

The third objective of the study was to examine the effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya. Correlation analysis showed there was a negative and significant association between

foreign exchange risk and financial performance of microfinance institutions. Regression analysis indicated that foreign exchange risk and financial performance of microfinance institutions have a negative and significant relationship. Credit risk is the potential change in net asset value due to changes in the perceived ability of counterparties to meet their contractual obligations. MFIs that have contracted commercial loans in foreign currencies are likely to be hit quite hard, due to foreign exchange losses. The third hypothesis (H_{03}) that there is no significant effect of foreign exchange risk on the financial performance of microfinance institutions in Kenya was therefore rejected and concluded that there is a significant relationship between foreign exchange risk and financial performance of Deposit taking Microfinance Institutions in Kenya. While foreign exchange risk hedging is by no means a new concept and one that the mainstream international financial markets are well equipped to handle, when it comes to microfinance it is a relatively new issue. However, foreign exchange rate risk arises from unexpected changes in currency rates, the potential loss that results from a change in the value of a currency. According to James, Ted and Sorin (2011) the market price of foreign exchange risk was found to have negative relationship with stock returns. However, the results do not agree with Mwangi (2013) that who found out that a strong positive relationship exists between financial performance in terms of ROA and use of forward contracts and options as foreign exchange risk management techniques. Further, Davis, Donkoh, Mawah and Amonoo (2018) indicated that the profitability of the microfinance banks was positively affected by foreign exchange risk as the case of Akuapem Rural Bank.

5.2.4 Interest rate risk

The fourth objective of the study was to examine the effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya. Correlation

analysis showed there was a positive and significant association between interest rate risk and financial performance of microfinance institutions. Regression analysis indicated that foreign exchange risk and financial performance of microfinance institutions have a positive and significant relationship. Interest rate is an important tool of monetary policy when dealing with microfinance institutions. Interest rate charged on loans advanced is one of main determinant of financial performance of financial institutions. Interest rate is seen as the price lenders expect (or in this case, the borrowers pay) for exchanging current claims for greater future claims to goods and services. The fourth hypothesis (H_{04}) that there is no significant effect of interest rate risk on the financial performance of microfinance institutions in Kenya was therefore rejected and concluded that there is a significant relationship between interest rate risk and financial performance of Microfinance Institutions in Kenya. The lending interest rates should enable MFIs to provide sustainable financial services to large numbers of poor clients while being independent of any form of subsidy. The results agree with Aykut (2016) showed interest rate risk had a statistically negative and significant effect on the volatility of bank profitability. Kathomi, Maina, and Kariuki (2017) further found that there was statistically and significant negative effect of lending rates on sustainability of MFIs. This means that increasing the interest rate reduces the return thus rendering the MFIs unsustainable.

5.2.5 Financial regulations

The fifth objective of the study was to examine the moderating role of financial regulations on the relationship between financial risks and the financial performance of deposit taking microfinance institutions in Kenya. The R^2 of the model summary before moderation was 48.83% but after moderation the R^2 improved to 53.87%. This implies that financial regulations enhance the performance of microfinance institutions. The

fifth hypothesis (H₅) was that financial regulations do not moderate the relationship between financial risk and financial performance of Microfinance Institutions in Kenya. Financial regulation is a form of supervision that subjects financial institutions to requirements, restrictions, and guidelines that aim to maintain the integrity of the financial sector. Regulation is done to maintain market confidence, protect financial stability, protect consumers, and regulate foreign participation in the financial markets. Financial regulation allows for a well-structured financial system.

Hypotheses were tested using p-values. The criterion was to reject null hypothesis if the p value calculated is less than the critical p value of 0.05. The first hypothesis (H₁) that there is no significant effect of liquidity risk on the financial performance of deposit taking microfinance institutions in Kenya was rejected and concluded that there is a positive significant relationship between liquidity risk and financial performance of Microfinance Institutions in Kenya. The second hypothesis (H₂) that there is no significant effect of credit risk on the financial performance of deposit taking microfinance institutions in Kenya was also rejected and concluded that there is a negative significant relationship credit risk and financial performance of Microfinance Institutions in Kenya.

Further, the third hypothesis (H₃) that there is no significant effect of foreign exchange risk on the financial performance of deposit taking microfinance institutions in Kenya was rejected and concluded that there is a negative significant relationship between foreign exchange risk and financial performance of Microfinance Institutions in Kenya. Moreover, the fourth hypothesis (H₄) that there is no significant effect of interest rate risk on the financial performance of deposit taking microfinance institutions in Kenya was therefore rejected and concluded that there is a positive significant relationship

between interest rate risk and financial performance of Microfinance Institutions in Kenya. Finally, the fifth hypothesis (H₅) that there is no significant moderating effect of financial regulations on the relationship between financial risks management strategies and the financial performance of deposit taking microfinance institutions in Kenya was also rejected and concluded that financial regulations moderate the relationship between financial risk and financial performance of microfinance institutions in Kenya.

These regulations ensure that the MFIs experience cash flow that is adequate to prevent bankruptcy by limiting out flow of cash. Credibility of MFIs brings forth clientele that ensures continuous cash flow for the stability of the overall economy. Thus, micro finance institutions must be structured in compliance with the financial regulations provided by the government. This is because only licensed financial institutions can provide services in most countries. From the study findings, it is recommended that all Micro-finance banks in Kenya to follow all regulation and guidelines in the Act 2008 to facilitate effective and efficiency in operation and service delivery. The study recommends that the banks to improve their solvency by increasing the value of liquid assets and reduce the current liabilities within their operation. Emanating from the findings, the study recommends that Government should tighten up the regulations governing MFIs` businesses in Kenya to ensure a complete regulatory framework. This will ensure that it is one stop for the licensing of Microfinance operations in Kenya as opposed to the current system where there are different forms of institutions offering Microfinance services. MFIs on the other hand should try to improve the quality of their loan portfolio to maintain the minimum risk percentage so that they can attract more investors. They should also maintain the minimum capital adequacy levels and liquidity to ensure that clients are protected and they are able to meet their short-term obligations.

5.3 Conclusion

The conclusions of this study were informed based on the findings of the study. Each objective was reviewed and a conclusion provided that covers theory and practice. The general objective of this study is to establish the moderating effect of financial regulation on financial risks and the financial performance of deposit taking microfinance institutions in Kenya. Based on research finding it can be concluded that liquidity risks affect financial performance of Microfinance Institutions in Kenya. Illiquid micro finance institution may render a financial institution incapable of meeting the short term demands of their customers in timely manner. The customers of the financial institutions include the depositors and the investors. MFIs will create liabilities through savings from depositors and assets through giving loans to investors. However, when depositors make small savings in short terms and MFIs lend much to investors in long term, the financial institution may be exposed to liquidity risks.

It is also concluded that credit risks affect financial performance of Microfinance Institutions in Kenya. Credit risk involves screening clients to ensure that they have the willingness and ability to repay a loan. Effective management of credit risk through proper management results in the improvement of earnings and reduces insolvency. Credit risk affects the profitability and the general performance of any financial institution and is one of the major risks to microfinance institutions sustainability.

Based on research finding it can also be concluded that foreign exchange risks affect financial performance of Microfinance Institutions in Kenya. Foreign exchange exposure refers to the sensitivity of a firms cash flows, real domestic currency value of assets, liabilities, or operating incomes to unanticipated changes in exchange rates. MFIs must lend these funds in their local currency, immediately creating foreign

exchange rate risk. Furthermore, these institutions operate primarily in developing countries where the risk of local currency devaluation is the highest. These risks prevent access to many potential funding sources, including debt capital.

The study also concluded that interest rate risk affects financial performance of Microfinance Institutions in Kenya. Interest rate is an important tool of monetary policy when dealing with microfinance institutions. Interest rate charged on loans advanced is one of main determinant of financial performance of financial institutions. Interest rate is seen as the price lenders expect (or in this case, the borrowers pay) for exchanging current claims for greater future claims to goods and services. The level of Non-Interest expenses affects the rate of profitability of financial institutions. The lending interest rates should enable MFIs to provide sustainable financial services to large numbers of poor clients while being independent of any form of subsidy.

Finally, it can be concluded that financial regulations moderate the relationship between financial risks and financial performance of microfinance institutions. Financial regulation is a form of supervision that subjects financial institutions to requirements, restrictions, and guidelines that aim to maintain the integrity of the financial sector.

These regulations ensure that the MFIs experience cash flow that is adequate to prevent bankruptcy by limiting out flow of cash. Credibility of MFIs brings forth clientele that ensures continuous cash flow for the stability of the overall economy. Thus, micro finance institutions must be structured in compliance with the financial regulations provided by the government. This is because only licensed financial institutions can provide services in most countries.

5.4 Recommendations

Based on the results of the findings and the conclusions drawn from the study, the various recommendations for the micro finance institutions were proposed. The recommendations are based on the study findings of the study. The study may benefit micro finance institutions in managing their financial risks.

5.4.1 Implications to policy and practice

The study findings are important to the MFIs regulators. The regulator can highlight the successes and challenges facing financial risks and financial performance in microfinance institutions and thereby helping policy makers like the Association of Microfinance Institutions of Kenya (AMFIK) and regulators like the CBK to make informed decisions. Policy makers can detect loopholes within the management of the institution and thus advise the Microfinance Institutions or take further action. It further provides an insight in understanding the degree to which the microfinance institutions are compliant with different sections of the codes of best practice and where they are experiencing difficulties.

5.4.2 Implication to Theory

The study established that effective financial risk management is required so as to minimize financial risks that MFIs are exposed to. The results thus make unique contribution to the risk management theory. Risk management theory indicates that market and credit risks would have either direct or indirect effect on banks survival. Regulators are concerned with overall risk and have minimum concern with individual risk of portfolio components as managers are capable of window dressing the bank position. The need for total risk shows that measurement of risk cannot be centralized as risk of a portfolio is not just a sum of component as per Markowitz theory. This

implies that portfolio risk must be driven by portfolio return which is invariant to changes in portfolio composition. Risk management theory is integral in examining financial risks that accrue to the deposit taking microfinance institutions in Kenya.

It was also established that prudent credit risk management is essential in promoting MFI financial performance. The results make some important contribution to the Stakeholder Theory. Stakeholder Theory concentrates on the balance of stakeholder's interests as the determining factor of company policy. The most promising contribution to risk management is the extension of implicit contracts theory from employment to other agreements, including sales and financing. Since corporate risk management practices lead to a reduction in expected costs, company value rises. The theory further indicates that companies need more efficient risk management strategies to improve the company value. However, the theory falls short in determining how different risk management influence the financial performance of firms. The theory is important in identifying how financial risk management can be employed by the management of deposit taking microfinance institutions to foster their credit risks and improve the financial performance. The level of credit risk management helps to foster the asset quality and loan book of institutions which is essential to improving the shareholder value.

It was also established that liquidity risks affect financial performance of MFIs. The results make contribution to the Shiftability Theory of Liquidity. The ability of the institution to efficiently manage assets that can be simply transferred in a secondary market without delay and appreciable loss is a fundamental source of liquidity. According to the Shiftability Theory of Liquidity, for an asset to be classified as shift

able, it must be instantly transferrable with no unacceptable loss arising from the transfer of the asset when the need arises

Foreign exchange rate affects performance of MFIs. The results add some contribution to the New Institutional Economics Theory. According to the New Institutional Economics Theory, the practices of managing risks could be determined using practices that are accepted in the industry or the market. Furthermore, through the theory, security is linked with asset purchase that are specific, implying that management of risk can be significant in contracts binding two sides without giving a chance for diversification, like a corporation in a supply chain or a large contract of financing. In light of the growing interest in the derivatives market and hedging instruments the current theory helps in expounding how foreign exchange risk exposure influences the financial performance of deposit taking MFI.

Finally, it was established that financial regulations on the relationship between financial risks and the financial performance of deposit taking microfinance institutions in Kenya. The results inform the New Theory of Financial Regulation. The basis for the new theory of financial regulation is the requirement to know the regulation is needed to foster a stable economic structure in order to avert the price and output volatility that can lead to financial crises. The central banks role as a regulator having an independent preeminent role to target inflation and induce the correct price signals regarding the cost of capital in order to mould market participants' behaviour as to the allocation of scarce resources. This is done through prudential supervisory systems appropriate to the strengths or weakness of the protective measures.

5.4.3 Implication for Further Research

The study focused on financial risks, financial regulation and financial performance of deposit taking micro finance institutions in Kenya. Further research should focus on studying financial risks and financial performance of the deposit taking micro finance institutions to date. In doing so, it will be possible to understand how microfinance institutions manages financial risks and how this compares to financial risks of other financial institutions.

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APPENDICES

Appendix I: Data Extraction Form

MFI	Year	Liquidity risk	credit risk	Foreign exchange risk	Interest rate risk	core capital	ROA
Kenya Women Microfinance	2010	0.358698	0.114402	79.23315	0.007945	0.17	0.219573
Kenya Women Microfinance	2011	0.294661	0.142782	88.81077	0.19764	0.13	0.434748
Kenya Women Microfinance	2012	0.444536	0.109446	84.44089	0.199421	0.179777	0.244947
Kenya Women Microfinance	2013	0.273354	0.139555	86.34747	0.21644	0.191128	0.108588
Kenya Women Microfinance	2014	0.244144	0.113535	88.00405	0.188697	0.256291	0.305185
Kenya Women Microfinance	2015	0.284367	0.135167	98.59976	0.188977	0.23153	0.004541
Kenya Women Microfinance	2016	0.28449	0.127025	101.2518	0.193699	0.232166	0.329971
Kenya Women Microfinance	2017	0.793195	0.050033	103.567	0.211572	0.742048	1.425453
Kenya Women Microfinance	2018	0.21	0.10644	102.7273	0.170712	0.17	-0.02796
Rafiki Microfinance	2010	0.304146	0.182782	79.60853	0.064485	0.17914	0.279125
Rafiki Microfinance	2011	0.271803	0.183893	88.96389	0.00907	0.174933	0.20866
Rafiki Microfinance	2012	0.173847	0.162153	84.86125	0.04951	0.159217	0.12296
Rafiki Microfinance	2013	0.422185	0.153805	86.34554	0.04951	0.136574	0.012503
Rafiki Microfinance	2014	0.354429	0.191645	88.31278	0.101255	0.241629	0.211283
Rafiki Microfinance	2015	0.534482	0.2174	99.0076	0.113081	0.21168	0.179842
Rafiki Microfinance	2016	0.125533	0.146425	101.5322	0.125836	0.172093	0.250154
Rafiki Microfinance	2017	0.192982	0.050067	103.7442	0.096774	0.112691	0.475219
Rafiki Microfinance	2018	0.21	0.151384	102.984	0.100992	0.15	-0.03174
Faulu Kenya	2010	0.250579	0.140807	79.72834	0.135797	0.19	0.312843
Faulu Kenya	2011	0.248717	0.125918	88.96389	0.18829	0.207354	0.243493
Faulu Kenya	2012	0.243858	0.133246	84.70397	0.148337	0.09	0.221003
Faulu Kenya	2013	0.232649	0.113675	86.60872	0.13061	0.192169	0.467508
Faulu Kenya	2014	0.244289	0.136565	88.40645	0.135482	0.236291	0.250016
Faulu Kenya	2015	0.31419	0.1337	98.86397	0.127429	0.21168	0.012398
Faulu Kenya	2016	0.339839	0.1738	101.8607	0.137126	0.222157	0.244048
Faulu Kenya	2017	0.263437	0.080467	103.3766	0.157279	0.221831	1.260891
Faulu Kenya	2018	0.27	0.131133	102.8929	0.131166	0.16	0.006648
SMEP	2010	0.277217	0.269221	79.13386	0.199263	0.33346	0.192826
SMEP	2011	0.295726	0.251402	88.94801	0.178679	0.434258	0.256111
SMEP	2012	0.284173	0.237149	84.98386	0.20393	0.563657	0.0045
SMEP	2013	0.262582	0.27187	86.08094	0.191566	0.144211	0.264629
SMEP	2014	0.293589	0.224517	88.24356	0.222876	0.311284	0.00241
SMEP	2015	0.243012	0.278167	98.41649	0.184414	0.314687	0.454167
SMEP	2016	0.348705	0.2373	100.9529	0.157954	0.217885	0.238426
SMEP	2017	0.234103	0.306683	103.8616	0.157279	0.893175	0.320925

SMEP	2018	0.30	0.246661	102.8138	0.170632	0.17	-0.00748
Remu Microfinance	2010	0.79595	0.104194	79.72834	0.087621	0.334195	0.154489
Remu Microfinance	2011	0.817607	0.128955	88.9862	0.040323	0.81	0.163726
Remu Microfinance	2012	0.853401	0.093674	84.70397	0.082873	0.110561	0.143646
Remu Microfinance	2013	0.672859	0.112359	86.37828	0.080119	0.100306	0.053412
Remu Microfinance	2014	0.813417	0.13047	88.38897	0.106329	0.791717	0.266409
Remu Microfinance	2015	0.33432	0.061833	97.99482	0.128463	0.276128	0.191436
Remu Microfinance	2016	0.363342	0.136475	100.8879	0.168508	0.581311	0.258065
Remu Microfinance	2017	1.541412	0.237167	103.9971	0.144068	0.971325	1.191919
Remu Microfinance	2018	0.75	0.145158	97.92906	0.120092	0.33	-0.03233
Century Microfinance	2013	0.244307	0.018437	85.95598	0.042683	0.751505	0.1315
Century Microfinance	2014	0.2616	0.114951	88.07303	0.08658	0.384188	0.2705
Century Microfinance	2015	0.442828	0.089533	98.41649	0.13198	0.76136	0.2581
Century Microfinance	2016	2.093133	0.173375	101.0191	0.16	0.142873	0.3251
Century Microfinance	2017	1.269174	0.0406	103.038	0.083333	1.95164	0.2642
Century Microfinance	2018	0.45	0.101169	79.93894	0.118329	0.19	-0.058
Sumac	2013	0.211838	0.014122	86.79261	0.18241	0.105611	0.260586
Sumac	2014	0.272905	0.031562	88.33112	0.215385	0.511612	0.29589
Sumac	2015	0.426922	0.0103	98.06165	0.197368	0.361427	0.222039
Sumac	2016	0.293342	0.02975	101.8603	0.232877	0.331564	0.270525
Sumac	2017	1.615635	0.047367	103.8813	0.188215	0.971404	1.245345
Sumac	2018	0.33	0.029139	99.93221	0.183007	0.23	0.003268
U&I Microfinance	2013	0.634281	0.030852	86.34289	0.1125	0.134135	0.294947
U&I Microfinance	2014	0.573831	0.027311	87.97023	0.124088	0.164789	0.473684
U&I Microfinance	2015	2.172871	0.016967	98.75515	0.168478	0.251276	0.228261
U&I Microfinance	2016	0.27295	0.047975	101.7587	0.150997	0.581011	0.325123
U&I Microfinance	2017	1.211391	0.098433	104.9369	0.187192	0.512747	1.27673
U&I Microfinance	2018	0.21	0.054458	98.3481	0.159176	0.47	0.014981
Caritas	2015	0.43283	0.0438	95.84698	0.004785	0.591444	0.043011
Caritas	2016	0.474334	0.059043	101.9064	0.012195	0.141938	0.131488
Caritas	2017	2.313875	0.086867	103.5105	0.03868	1.521473	1.658491
Caritas	2018	0.37	0.063236	102.5166	0.074759	0.28	-0.06833
Daraja	2015	0.322723	0.070267	99.15066	0.024096	0.231303	0.12987
Daraja	2016	0.731465	0.08235	97.78548	0.055556	0.82114	0.173469
Daraja	2017	2.241517	0.250767	103.0295	0.077381	1.771537	1.615385
Daraja	2018	0.21	0.134461	95.17761	0.098837	-0.38	-0.18605
Maisha Microfinance	2015	0.692611	0.0566	98.62626	0.090117	0.761395	0.172643
Maisha Microfinance	2016	0.832808	0.169975	97.66373	0.011696	0.83115	0.093458
Maisha Microfinance	2017	1.251623	0.302233	104.9105	0.096026	0.871854	1.188976
Maisha Microfinance	2018	0.26	0.176269	90.84286	0.16263	-0.07	-0.41176

Choice Microfinance Bank	2015	0.674796	0.0592	98.04562	0.012987	0.182433	0.0288
Choice Microfinance Bank	2016	0.333401	0.1996	98.23278	0.057377	0.42229	0.0365
Choice Microfinance Bank	2017	1.114127	0.2134	94.96342	0.095588	1.971254	0.0114
Choice Microfinance Bank	2018	0.03	0.2392	79.10818	0.112245	-0.46	-0.42857
Uwezo	2010	0.42573	0.214719	79.09268	0.172981	0.654483	0.208811
Uwezo	2011	0.384745	0.209659	78.89406	0.101695	0.94	-0.13559
Uwezo	2012	0.523258	0.195263	88.02538	0.25641	0.88	0.307692
Uwezo	2013	0.252821	0.219227	86.93373	0.17757	0.129131	0.046729
Uwezo	2014	0.154203	0.201853	87.90082	0.15625	0.531793	0.259585
Uwezo	2015	0.283013	0.2129	98.15211	0.176991	0.791493	0.221239
Uwezo	2016	0.493037	0.191	100.2328	0.186916	0.841013	0.264151
Uwezo	2017	1.08123	0.2224	103.8309	0.117925	1.311484	1.184358
Uwezo	2018	1.06	0.208767	63.18533	0.111111	0.69	-0.12

Appendix II: List of Deposit Taking Microfinance Institutions

1. Century DTM Ltd
2. Faulu Kenya DTM
3. Kenya Women Finance Trust DTM
4. Remu DTM Ltd
5. SMEP DTM
6. Uwezo DTM Ltd
7. Rafiki Deposit Taking Microfinance Ltd
8. Uwezo Microfinance Bank Limited
9. Caritas Microfinance Bank
10. Choice Microfinance Bank
11. Daraja Microfinance Bank
12. Sumac Microfinance Bank Limited
13. U&I Microfinance Bank Limited

Source. CBK website 2019

Appendix III: Research License

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