MARKET RISK, FINANCIAL LEVERAGE AND FINANCIAL PERFORMANCE OF MICROFINANCE INSTITUTIONS IN KENYA

By

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A THESIS SUBMITTED TO THE FACULTY OF BUSINESS, COMPUTER SCIENCE AND COMMUNICATION STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION AND MANAGEMENT (FINANCE) OF ST. PAUL'S UNIVERSITY

AUGUST 2021

DECLARATION

I declare that this thesis is my original work and has not been presented in any other institution of learning for any academic award. This thesis has been complemented by referenced sources duly acknowledged. Where text or tables have been borrowed from other sources they are duly cited using current APA format and in accordance with anti-plagiarism regulations.

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DEDICATION

This thesis is dedicated to my wife Peninnah Kabura, our sons Philip, Patrobert and Philbert for their love, understanding and great moral support that enabled me to complete my PhD study. Special thanks to my late dad Philip Kahihu and my mum Lucy Wanjiru for planting a seed in me to reach greater heights.

ACKNOWLEDGEMENTS

I appreciate the Almighty God for the graces and provisions that enabled me to undertake my PhD study. My special appreciation is to my supervisors, Prof. Muturi Wachira and Dr. Stephen M.A Muathe for their commitment and expert guidance throughout the process of the thesis. I am also grateful to members of St. Paul's University for their moral support and understanding during the whole process of my study and to all my colleagues in the PhD class for their invaluable contribution and support.

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OPERATIONAL DEFINITION OF TERMS

Financial Leverage Risk The possibility of disproportionate losses related to the amount of interest expense where the borrower does not earn sufficient returns to offset the interest expenses. It is the proportion of long-term debt to the shareholder's fund in the capital structure.

Financial Performance The measurement of the total earnings generated by an organization from the shareholders' funds expressed in monetary terms. It indicates the earnings before interest and tax the organization has generated over the total shareholder's fund within a given period.

Financial Risk It is a risk that involves financial loss to firms. The risk arises due to instability and losses in the financial market caused by movements in stock prices, currencies, interest rates and more.

Firm Size Firm size refers to the scale of operation of an organization in terms of annual turnover, asset base and number of customers. The size is determined by the firm's total assets base.

Foreign Exchange Risk It is a risk arising from fluctuations in the value of a currency against a foreign currency where a person has invested. Different types of foreign exchange risk include transaction exposure, translation exposure and economic exposure.

Inflation Risk This is the probability that an investor might get losses from erosion of income from the investment due to the rising cost of goods and services. It indicates the effect of the nominal rate of interest charged over the real rate of interest charged by the government securities within a period.

Interest Rate Risk It is a risk where there are chances that an unexpected change in interest rate will negatively affect the value of an investment. It indicates how the earnings before interest and tax cover the interest and fees charged from the borrowings.

Market Capitalization It is the aggregate market value of a company represented in the dollar amount. It represents the market value of a company. It is computed based on the current market price (CMP) of its shares and the total number of outstanding shares and indicates the size of the company.

Market Risk It is a risk that causes fluctuation of income and hinders the organization to achieve its budgeted financial performances. The market risk variables in this study include interest rate, inflation rate and foreign exchange risk.

Microfinance Institution It is a financial development that primarily provides financial services to low-income groups and Micro and Small Enterprises (MSEs) which usually lack access to formal financial institutions in the country.

Net Foreign Exchange Position It is a financial ratio that compares the net foreign asset and liabilities over the shareholder's fund. The ratio measures the foreign exchange risk.

Performance This is the evaluation of how the organization has effectively and efficiently utilized its resources to achieve its objectives. It is estimated by how much the organization has earned within the year over the total shareholder's fund.

ABBREVIATIONS AND ACRONYMS

ACCION	Americans for Community Co-operation in Other Nations
CBK	Central Bank of Kenya
CIG	Cumulative Interest Gap
DTM	Deposit Taking Microfinance
DTS	Deposit Taking Sacco
EVT	Extreme Value Theory
FP	Financial Performance
FSS	Financial Self Sufficiency
FX	Foreign Exchange
GDP	Gross Domestic Product
MBs	Multilateral Banks
MFIs	Microfinance Institutions
MPT	Modern Portfolio Theory
NACOSTI	National Commission for Science, Technology and Innovation
NOP	Net Open Position
OSS	Operating Self Sufficiency
PPP	Purchasing Power Parity
ROA	Return on Assets
ROE	Return on Equity
SACCO	Savings and Credit Cooperatives
SEWA	Self Employed Women's Association

SSI	Self Sufficiency Index
VIF	Variance Inflation Factor
VAR	Value at Risk

ABSTRACT

Microfinance institutions are crucial in the financial sector worldwide as they facilitate the access to financial services to a wider range of customers. There has been a tremendous increase in the number of registered microfinance institutions in Kenya which has shown continuous growth with an increase in asset base and customer deposits. Despite the growth in terms of the number, customer's deposit and asset base of the microfinance institutions in Kenya, most of them have reported a decline in their financial performance which is attributable to effects of market risk variables within the period under study. This study set out to investigate market risk, financial leverage and financial performance of microfinance institutions in Kenya. The specific objectives of the study were to investigate the effect of interest rate risk on financial performance; examine the effect of inflation risk on financial performance; establish the effect of foreign exchange risk on the financial performance; and to determine the effect of financial leverage risk on financial performance of Microfinance Institutions in Kenya. The study further sought to assess the moderating effect of a Firm's size on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya. The study was anchored on the Dynamic Capabilities theory supported by Resources- Based theory, Extreme Value theory, Expectation theory of Exchange rate, International fisher effects theory and Modern Portfolio theory. This study made use of the positivism philosophy and the explanatory non-experimental research design. The target population was all the thirteen registered Deposit Taking Microfinance institutions in Kenya and a census approach was used. The study used secondary data which was collected from microfinance institution's annual audited financial reports for the period between 2014 and 2018 using a data extraction instrument. Diagnostic tests which included Variance Inflation Factor to test on multicollinearity, Wooldridge test for autocorrelation, Likelihood ratio test for heteroscedasticity, Skewness, and Kurtosis for normality test and Fisher-type unit root tests for stationarity were applied. Panel multiple regression analysis was used to analyze the collected data with the help of STATA. The findings indicated that interest rate risk has a significant positive effect on the financial performance of microfinance institutions. Foreign exchange risk has a significant negative effect on the financial performance of microfinance institutions. The inflation rate risk had no significant effect on the financial performance of microfinance institutions. Financial leverage had a significant positive effect on the financial performance of microfinance institutions in Kenya. Lastly, the study found that firm size had a significant moderating effect on the relationship between market risk and financial performance of microfinance institutions in Kenya but no moderating effect on the relationship between financial leverage and financial performance. The study concluded that, for microfinance institutions to contribute to the Kenya Vision 2030 blueprint for the country economy to raise Gross Domestic Price (GDP) growth rate to at least 10 % and to offer financial access to citizens, the market risk variables must be addressed. The study therefore recommends that the government should put in place proper monetary and fiscal policies in the country to curb market risk variables. The CEOs of microfinance institutions should employ mechanisms of identifying market risk variables to enable them to put the necessary measures to mitigate them. The management should ensure they identify the optimal financial leverage level to operate on and enhance the financial performance of microfinance institutions in Kenya.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Microfinance is one of the economic activities that is geared towards building the capacities of the poor who are largely ignored by most of the large financial sector players among them commercial banks and other lending institutions (Hayes, 2019). The microfinance industry assists the poor by graduating them to sustainable self-employment activities by providing them with access to financial services like credit, saving and insurance (Kagan, 2020). Microfinance institutions in the world were established to serve the population which is regarded by commercial banks to be of the highest risk to offer their loans and also considered to be in the class of "unbankable" because of their small savings (Kono & Takahashi, 2010).

The microfinance industry has a unique practice in its operation on its ability to combine both financial and social intermediation, which is known as the double bottom line, in achieving its goals. Combining social interactions with the mobilization of funds in the society has facilitated many microfinance institutions (MFIs) to achieve a wide outreach to rural people (Anand & Shakeel, 2012).

Market risk is a financial risk that cause loss of financial income to the organization which is inherent to all organizations and affects the organization's financial performance (Mudanya & Muturi, 2018). During times of severe economic conditions caused by market risk, the firm's financial performance can worsen by increased costs of operations and reduced income leading to the firm incurring huge losses and if conditions persist, this may

lead to its collapse. Management of firms must identify the possible market risk variables and put in place corrective measures (Muriithi *et al.*, 2016).

Financial leverage risk is a factor that assists in estimation of firms' financial performance and financial sustainabilty. Highly leveraged firms that are more exposed to market risk factors showed more profitability and are more sustainable. All activities that are related to sustainable finance especially to the microfinance industry impact on the investing and development of their financial system in a more sustainable way (Aharon & Yagil, 2019).

Microfinance institutions must undertake risk assessment exercises for the identification of various risks involved to put mitigation measures, to minimize losses in their income which affects their financial performance (Mirza & Javed, 2013). The organization should strive to manage the effects of market risk at an optimum level to be able to maintain its financial performance at a satisfactory level (Nimalathasan & Pratheepkanth, 2012).

David and Muendo (2018) noted that MFIs' financial performances are usually affected by various statutory requirements laid down by their governing bodies which interfere with market risk variables like interest rates and inflation rates. Regulations on the capital adequacy where the MFIs are required to raise minimum capital cause them to seek high-interest borrowings for them to operate, which affects their financial performance negatively. Statutory requirements on liquidity ratio and cash reserve also affects MFIs' financial performance.

Despite many reforms that the Kenya government has instituted in the microfinance industry, the industry has experienced poor financial performance over the period. Therefore, it is imperative to investigate market risk, financial leverage and financial performance of microfinance institutions in Kenya. The study also investigated the

moderating effect of firm size into the relationship between the market risk, financial leverage and financial performance of microfinance institutions in Kenya.

1.1.1 Financial Performance

Financial performance refers to the degree to which the financial objectives of an organization have been achieved which entails the process of measuring the outcomes achieved from how well the firm utilizes its resources and applies its policies in operations expressed in monetary terms (Verma, 2018). It is an indicator of business achievements and shows its overall financial health over a specified period. It indicates how an entity has carried out maximum utilization of its resources to maximize the shareholder's wealth (Naz *et al*., 2016).

Andrija and Filip (2017) observed that financial performance is a key determinant of assessing how the organization has succeeded in achieving its objectives. The organization measures whether it has generated enough income for maximizing the shareholder's wealth as opposed to the mere maximization of the firm's net profit. Rupa (2015) noted that financial performance measures among them a debt to equity ratio, return on assets, operating self-sufficient and profit margins which are key drivers that determine the financial performance of the MFIs. The study found that the organization should manage the variables that are used to calculate the above financial performance measures depending on their influence on financial performance.

The age of the MFIs usually determines its financial performance. The more experiences the MFIs have operated the more they gain experience on how to tackle their challenges and to explore new opportunities. Older MFIs have shown better performance in terms of achieving their financial goals than the younger ones (Vivek & Wadugu, 2016). Countries where

governments have instituted better laws that favour MFIs have resulted in dynamic MFIs that show impressive growth. These efforts by their governments to enact laws and regulations have facilitated the MFIs to operate and compete with other financial players in the sector (Aslam *et al.,* 2019).

Government regulations have enabled the MFIs to strive to achieve their goals of poverty alleviation, empowerment and financial inclusions. Technological innovation, product requirement and efforts in strengthening the capacity of those MFIs has resulted in a reduction of operating costs, an increase in their outreach and achieving profitability (Rupa, 2016).

Naveen, Manjunath and Srikanth (2012) observed that Indian MFIs portrayed better financial performance within several years compared to Bangladesh MFIs who started the concept of microfinance institutions. The Indian MFIs were more profitable and operated efficiently in terms of managing loans lent to customers, managing their clientele well and achieving financial sustainability. The overall financial performance of the MFI industry was measured using Return on Equity (ROE) which showed steady increase year by year while those of Bangladesh showed gradual decrease. Veton *et al*. (2021) observed that organizational financial stability influences the overall financial performance especially when it applies to financial institutions like banks or MFIs in a country. The essential functions of financial stability among them investment, economic growth and trade openness affect the overall operations of the bank.

Sujani, Stuart and Krishna (2017) noted that MFIs in Sri Lanka were not lucrative and had a poor financial performance. The MFIs had a low ROA of 1.4 %, poor average portfolio yield and they did not have a healthy credit portfolio. However, European MFIs showed

better financial performance within the same period and this was attributed to the influence by the high intensity of social capital. Any conditions that countries put for the development of social resources and social capital have an impact on the financial performance and efficiency of European MFIs. The age of MFIs was found to have an influence on their financial performance. More experienced MFIs performed better than young MFIs in terms of their efficiency and sustainability (Gabriela *et al*., 2018).

Ethiopian MFIs portrayed a better financial performance and a wide outreach compared to other MFIs within the Eastern and Central Africa region. Their financial performance measured in terms of asset holdings and yield on portfolio showed a significant influence on social outreach performance (Solomon *et al.*, 2019). An organization's managers must strive to achieve the best level of financial performance to enable the business to create a competitive advantage and to satisfy their stakeholders' expectations of wealth maximization (Gbadamosi, 2016).

The organization must carry out a financial performance analysis to know their financial health. The financial performance analysis to be undertaken depends on the financial objectives of the firm, whether it is liquidity, profitability, sustainability, overall efficiency, or growth (Shah, 2015). In the financial sector, financial performance is usually affected by market trends. Financial institutions are the major lenders of capital funds as well as the major investors in various firms, thus their portfolio performance is drawn by earnings of other sectors they have invested on. When the economy is healthy and businesses are expanding they will have increased revenues and thus high returns (Sean, 2019).

A developed variety of MFI-bank relationships exist in Europe and these relationships are shaped by the legislature and economic national context. MFIs benefit through this

collaboration by having access to funding and from banks advanced technology which reduces their cost and improves their financial performance. Banks on the other hand benefit from having a better image through corporate social responsibility. MFI clients are offered access to their accounts through collaborating bank branches and this is financial inclusion in the financial sector (Cozarenco, 2015).

The ownership status of Latin American MFIs affects the financial and social performance. Both NGO-type MFIs and commercialized MFIs have the objective of obtaining financial sustainability and reaching out to spread clients in various villages. The NGO-type MFIs are more concerned about the outreach rather than high profitability and thus they have better social performance. The commercialized MFIs on the other hand, are interested in both financial performance and social performance. They strive to achieve high profitability with more funds to open more branches (Waqas *et al.*, 2018).

MFIs in the Northern Africa region especially Morocco, have shown a decline in the average efficiency in terms of operational and financial performance. Morocco's MFIs are faced with a crisis due to deep deterioration in loan portfolio quality. Emerging markets such as Syria, Sudan and Lebanon show the lowest efficiency in terms of fluctuations in their financial performance (Abdelkader *et al.*, 2014).

Kipesha (2013) observed that Tanzanian MFIs have shown high efficiency in terms of social outreach performance, increased number of customers, loans to the members, and improved internal business processes. In terms of financial performance, Tanzanian MFIs face financial unsustainability due to low productivity and low profitability. They strive to improve on both financial and non-financial performance through various strategies for reducing their operating costs to survive in the financial sector.

Abdirashid and Jagongo (2019) noted that an organization's internal operation processes and policies on loans affect their financial performance. MFIs' management of loans through issuance and collection plays a vital role in determining their financial performance. Loan performance is affected by MFIs' internal regulations, credit appraisal process, credit policy and credit risk control measures undertaken.

Sunday, Turyahebwa, Byamukama and Novembrieta (2013) observed that Uganda's MFIs recorded better financial performance than most of other MFIs in the Eastern African region. Those MFIs showed a high degree of improvement in financial performance within several years. The study compared the financial performance of Uganda's MFIs within several years. The high financial performance observed had enabled those MFIs to be self-sufficient and financially stable which facilitated the growth of Uganda's MFIs in general.

Mugo *et al.* (2018) observed that for the deposit-taking SACCO to maintain a good financial position they must be ready to invest in financial innovations, especially information technology. The SACCO must adopt mobile communication services to be able to offer efficient services to their customers. The SACCO will need to invest a lot in technology to be able to remain relevant in the competitive financial sector. However, the study ignored other factors like access to cheaper loans from financiers, mobilization of deposits from the customers, and other internal factors that affect the overall performance. The effects of market risk variables need to be minimized for the organization to generate excess income to implement the financial innovations which are costly.

Omondi (2019) noted that microfinance institutions in Kenya must adapt to new financial innovations to be able to compete well in the changing business environment. Those financial innovations are driven by emerging financial technologies and the existence of

many players in the market. The hard economic conditions have resulted in little customer savings, and the MFIs have to rely on high-interest loans from commercial banks which eventually affects their financial performances.

Kipkoech and Muturi (2014) noted that the number of borrowers, capital adequacy and the size of the branch network largely are the key determinants that affects the financial performance of Kenya's MFIs. King'ori, Kioko and Shikumo (2017) concurred with the study and found that different determinants influence financial performance differently. Operating efficiency, capital adequacy, and firm size have a positive influence on financial performance whereas financial risk variables have a negative influence on financial performances.

MFIs in Kenya showed poor financial performance within the years 2014 - 2018 as shown in the Table 1.1 below of the Trends on the ROE.

Table 1.1: Trends in Financial Performance

Year	**Average ROE**
2014	9 %
2015	5 %
2016	(3.2) %
2017	(5.5) %
2018	(13.8) %

Source: CBK Supervisory report (2019)

Table 1.1 shows the trends in the financial performance of the MFIs for a period between years 2014 to 2018. The table showed a declining trend in the financial performance of the

MFIs within the entire period, from an ROE of 9% to a negative ROE of 13.8 % which is an indicator of poor financial performance.

For this study, financial performance referred to the measurement of the level of goal accomplishment of an organization expressed in monetary terms within a specified time. From the empirical studies reviewed (Naveen, Manjunath & Srikanth, 2012; Rupa, 2015) financial performance was measured using ROE and thus it was adopted in this study.

1.1.2 Market risk

Market risk is the potential loss of value of assets and liabilities arising from movement in market prices (Ghosh, 2012). Market risk is a risk of financial in nature that occurs due to fluctuations in the financial market and is caused by a mismatch between the assets and liabilities of a business. The mismatch in compositions of assets and liabilities of any organization will determine the kind of exposure it has to various kinds of market volatilities (Abhay, 2019).

In times of global financial crisis like in 2007, market risks affected the operation of the whole market and could not be avoided or mitigated by holding a certain portfolio (Ahmet, 2016). Market risk is inherent in every business and thus proper risk management strategies must be put in place to balance off risk and returns, minimizing negative effects on financial performance (Mudanya & Muturi, 2018).

Gietzen (2017) noted that MFIs are effected by different types of market risk variables depending on the macro environment they are operating in. MFIs operating in developed countries are more exposed to market risk than those in developing countries. Those MFIs are more exposed to the market risk variables comprising of interest rate risk and foreign

exchange risk. European MFIs are mostly affected by interest rate risk exposure due to the interest rate sensitivity in those markets. The Eastern European and Central Asian MFIs rely more on foreign capital and thus they are affected by the foreign exchange risk.

Namasake and Karanja (2016) observed that market risk can cause very severe losses to firms within a short period when operating in volatile market conditions. The losses to the income may cause the organization to collapse if the harsh situations persist for a longer period. It is a peril within the organization occurring out of activities within market prices; for instance, variations originate from interest rates, foreign exchange rates and product prices. Market risk causes losses of the expected income and thus it influences financial performance negatively.

Anit, Max, Sonja and Thomas (2012) observed that the Chief Executive Officer (CEO) of MFIs has the responsibilities of a risk management organization. The process involves risk identification and risk analysis, and mitigation measures put in place to manage those risks in an organization. The study noted that, in Europe and North America, market risk causes firms' decline in profits or even losses in their financial reports. During the financial crisis as experienced in 2007-2008, most of the organization's financial performance experienced losses due to the volatile market. The management must examine and realize the market risk profile affecting their organization whether is in the short-term mostly caused by total earnings volatilities or the long-term economic risk.

Vladimir, Boban and Boris (2013) concurred with the above study on market risk management. The study noted that market risk variables comprising of equity risk, interest rate risk, foreign exchange risk and commodity risk cause losses on firms' balance and off-

balance sheet items in the financial sector. During the time of extreme economic crisis, the effect of market risk causes investors to lose both money and assets invested in the firm.

Dodor *et al.* (2017) noted that microfinance institutions are faced with problems or risks that threaten their long-term viability and sustainability. Those risks impede the growth of microfinance schemes and have the potency to collapse the organizations. Lack of funding, credit risk and macroeconomic trends were identified as the greatest threats to the performances of microfinance institutions.

Musau, Muathe and Mwangi (2017) noted that an organization must ensure there are a tradeoff and synergies between financial inclusion and financial stability. Financial stability enhances financial inclusion through trust built in stable financial systems which increase the use of financial services and they facilitate better financial performance. Financial institutions utilize financial services to diversify risk and aid stability. The market risk is inherent in every business and organization must put in place the right risk management strategies to mitigate it The right strategies will be achieved by balancing between risk and return and minimizing potential adverse effects on performance (Mudanya & Muturi, 2018).

Ondiek and Muathe (2017) noted that an organization must keep previous records about risks to enable them to forecast future risks. Financial distress affects the financial performance of an organization therefore management must be aware of various risks and how to mitigate them to minimize the risk of poor financial performance. The firm must employ contingent measures to reduce financial risks and improve organizational performance.

Njuguna, Gakure, Waititu and Katuse (2017) noted that interest rate risk affects the financial performance and growth of MFIs. MFIs management have to put in place effective interest rate risk and price risk management practices. The MFIs acquire their funds through both internal and external sources. The use of external sources especially bank loans present an interest rate risk exposure to MFIs. The Kenyan MFIs have applied the pecking order theory whereby they first exploit cheap internal sources of funds before embarking on another source like bank loans.

Kamau and Njeru (2016) observed that interest rate risk influences the financial performance of financial institutions among them insurance companies. Market risk variables comprising of interest rate risk, stock prices and currency risk influences financial performance negatively. Interest rate risk causes the movements in levels or fluctuations of market prices of organization financial assets held. The fluctuations in stock prices influence access to foreign capital through foreign investments. The volatilities affect assets market value and the overall profitability.

According to a report by Emre, Benedict, Niko and Rafel (2019), interest rate capping had interfered with the Kenya government's monetary policy. The government introduced the interest capping rate to the financial sectors to curb the effect of interest risk. The study found that the introduction of interest rate caps by the Kenyan government caused the collapse of the issue of credits by micro, small and medium enterprises, reduction of loan book balance by the small banks and reduced financial intermediation.

Dodor, Tsorhe, Adede, Thywill, and Carkson (2017) observed that inflation rate risks threaten the long term viability and sustainability of MFIs. MFIs are vulnerable to pressures in the wider economy caused by macroeconomic risks especially inflation rate risk recession and volatile market. These risks have caused MFIs to remain unprofitable and to rely on external borrowings. Ioan, Andrea and Sorina (2015) noted that inflation rate risk is a central point of interest by the management of financial institutions considering the magnitude of the previous financial crisis in the world. Inflation rate risk causes market dynamics that lead to the instability of the organization's performance.

Zulfiqar and Nizam (2015) observed that inflation rate risk affects the firm's financial performance regardless of the industry and the sector. Siswanti, Eko and Embun (2015) concurred with the above study and noted that macroeconomy affects firm values and financial performance in Indonesia. The inflation rate risk has an impact on a company's stock price. The rise in the inflation rate causes the company's stock price to decline in the market and become unattractive to prospective investors which can highly affect their financial mobilization of capital for expansion.

Jamal, Noor and Ali (2014) observed that foreign exchange risk affects the financial performance of the financial sector. Foreign exchange risk causes the firms to be exposed to unanticipated changes between two countries' currencies. Investors and multinational businessmen who do business throughout the global economy are faced with this risk and sometimes they encounter severe financial consequences. Gietzen (2017) however noted that the effect of foreign exchange risk on the financial performance of MFIs in different regions is almost zero. This is attributed to the net off that is caused by the movement of

foreign exchange asset and foreign exchange liabilities in those different countries. The study used the net open position to measure the foreign exchange rate risk.

Kihara and Mwangi (2017) noted that Kenya's financial sector is exposed to foreign exchange risk. The abolishment of the fixed currency system by the Central Bank of Kenya which is replaced by the floating exchange rate causes foreign exchange fluctuations. The use of financial derivatives among them swaps, options and forwards has been a precautionary measure to curb the foreign exchange risk and has resulted in the improved financial performance of financial institutions in Kenya. Moh'd and Karim (2017) concur with the precedent study that MFIs having business in countries which have pegged exchange rate regime and those that are for profit-making can put measures to reduce foreign currency risk and become more profitable.

Most studies on market risk (Ghosh, 2012; Ahmet, 2016) among others have used interest risk and foreign exchange risk as a measure of market risk variables. Several studies (Ghosh, 2012; Anit, Max, Sonja, & Thomas, 2012; Aykut, 2016a, Mudanya & Muturi, 2018) used commodity price changes as a measure of market risk. Commodity price changes are caused by inflation risk which is a market risk variable (Reicher & Utlaut, 2011). The researcher adopted interest rate risk, foreign exchange risk, and inflation risk as a performance measure of market risk in the study.

1.1.3 Financial Leverage

Marin (2019) described financial leverage risk as the degree to which a company uses fixed-income security such as debt and equity to finance its operations. It is a risk to investors caused by an increase in debt capital in the organization's capital structure. The risk may

lead to the possibility of disproportionate losses related to the amount of interest expense where the borrower does not earn sufficient returns to offset the interest expenses. Daniela and Mircea (2012) referred financial leverage risk as a mechanism through which debt affects the return on equity, return on the rate of benefits which is the net income and equity. The study noted that economic and financial rates had an upward trend which reflected increased efficiency in the use of equity capital.

Kheder (2011) observed that higher financial leverage increases an organisation's risk profile and overall affects an organisation's financial performance. The degree of the financial leverage is a crucial factor to the financial institutions since it determines how firms have acquired their capital through either equity fund or through borrowings. Higher financial leverage increases the equity beta in estimation of the firm's market risk and leads to increase in variability of the firm's income. Therefore financial leverage and market risk are key variables that affect the financial performance.

Financial leverage risk can be measured using the interest covering ratio which provides useful information to the investors in the capital market. The ratio is an indicator of financial profits generated by the firms towards firms' sustainability. The financial leverage measures help financial institutions in making rational decisions when considering criteria for optimal capital structure (Hyunmi, 2019).

Ahmet (2016) noted that financial leverage influences the financial performance of conventional financial firms more than Islamic financial firms. The lower effects in the Islamic financial firms are explained by lower financial leverage in the Islamic market due to Sharia screening criteria which put a cap on the upper limit of the bearing on the interest-

based debts. Nimalathasan and Pratheepkanth (2012) observed that the effects of financial leverage usually affect the financial performance of various firms especially in terms of their profitability. The study noted that MFIs with high financial costs attributable to a high degree of leverage are more profitable.

Alshubiri (2015) observed that financial leverage, when used as a performance measure of financial risk indicated that it has a significant negative influence on the financial performance and thus the organization must have a strategy on how to mitigate it. In a study done in Bangladesh, Hussan (2016) however noted that, financial leverage impacts companies differently. Financial leverage negatively influences the sales revenue, earnings before interest, and tax and earning per share of the firm while in terms of long-term debt financing, it improves the permanent finance and success of the organization. From the empirical studies reviewed (Hussan, 2016: Hyumin, 2019) financial leverage risk was measured using Interest Covering Ratio which was therefore adopted in this study.

1.1.4 Firm's Size

Firm size in an organization can be expressed as a measure of the firm's or organization's annual revenue turnover and growth, its financial profitability, its market share in the industry, number of firm's outlets in the country, number of employees and revenue per employee (Fazil, 2018). A study on firm size, debt financing and financial performance found that a firm's size moderates the relationship between firms' leverage and financial performance. Large firms can access the debt market more easily than small firms and thus they have improved profitability. The large firms can generate high and less volatile returns and they document high liquidity compared to small firms. Therefore, small firms will suffer

from low liquidity due to the inability to access funds and volatile profits. The study measured firm size using the logarithm of total sales (Qamar *et al*., 2016).

Firm size plays a key role in the evaluation of determinants of financial performance in an organization. Firm size moderates on the effects of various factors affecting the financial performance. Large firms have more resources at their disposal, more staff, and a sophisticated information system that, when well-utilized results in higher financial performance. The huge asset base enables large firms to access additional capital as they offer them as collateral. Those large firms produce in large volumes and thus large sales turnover which give them high competitive power in the market (Almajali *et al*., 2012).

Mesut (2013) observed that firm size moderates the relationship between growth and profitability of the companies. They noted that large firms which are listed companies in the Stock exchange are more profitable than small firms in the same industry. Firm size was measured using the total assets held, total sales turnover and the number of employees of the firm. Amelie (2013) concurred with Mesut (2013) that firm size plays a major role in determining its profitability. They concluded that a firm's profitability tends to increase initially due to an increase in the firm's size up to a certain level but then declines across different measures of the firm size depending on the growth stage of the firm lifecycle. When small firms are in their growth stage, they tend to be more profitable since they usually take more risks to compete in the market. Accounting for market risk between a small and a large firm tends to reduce the gaps in profitability (ROA) but does not eliminate it.

Maja and Josipa (2012) noted that firm size influences business success. The study contended that in Croatia, in addition to the management applying various competitive strategies to achieve success, firm size plays a key influence in the overall profitability of a

firm. The larger firms have the market power to charge high prices and thus increase their profits. The larger firm also enjoys economies of scale, organizational benefits such as division of labour and specialization and technical benefits like various divisions sharing the fixed cost. The firms have more negotiating power that provides them with favourable financing conditions.

Olawale, Ilo and Lawal (2017) observed that a firm must concentrate on areas where they will gain more in terms of increase in sales turnover to improve on their financial performance. The firm must assess their optimal size for operation where they will be able to achieve better overall financial performance. When the firm improves on its sales turnover, it is an indicator of improvement in its financial performance. Thus, firms should focus on increasing their sales turnover by concentrating on areas that boost turnover like finding new markets for their products and innovating with new products. In a similar study on the manufacturing industries in Nigeria, Akinyomi and Olagunju (2013) found that when measured using sales turnover, firm size has a positive effect on a firm's profitability.

Onsongo *et al*. (2019) found that firm size has a moderating effect on the relationship between risk and financial performance. The study found that large firms with higher total assets than their counterparts in the same industry played a better role in the risk management of the company. The organization should manage various risks affecting their industries well by implementing risk management initiatives and increasing their total assets base to be able to generate enough income and to record improved financial performance.

Kipesha (2013) observed that there is an impact of a firm’s size and age on the financial performance of MFIs. Different results were found which depended on the performance indicator used. When firm size is measured using total assets and the number of borrowers,

the results showed that firm size influences financial performance positively. On the other hand, when firm size is measured using the number of employees in the MFIs, there is a negative impact on efficiency sustainability and profitability.

Kenyan MFIs have shown that firm size moderates factors that influence financial performance. A study by King'ori *et al*. (2017) noted that firm size is a key variable which moderates various determinants of financial performance of Kenyan MFIs. Larger MFIs showed a high degree of operational efficiency which leads to better financial performance. The study used the log of the asset as a performance indicator of firm size.

Maina, Kiragu and Riro (2019) observed that there is a relationship between firm size and the financial performance of financial institutions. The study found that a firm's size has a positive relationship with a firm's financial performance. Firm size was measured in terms of customer deposit and loans advanced. Koncova *et al.* (2016) contended with the study that firm size influences financial performance. Large firms have potential to reach high economic performance compared with small firms. This is attributable to large firms enjoying economies of scale.

Most of the empirical studies reviewed (Qamar, *et al*., 2016; Almajali,*et al*., ,.2013; Amelie, 2013; Mesut, 2013) have used firm size as a moderating variable measured by the logarithm of total assets in the relationship between risk and financial performance and this has been adopted by this study.

1.1.5 Microfinance Institutions

Microfinance institutions have developed over the years and have assisted with the growth of the financial sector, in general, to cater to a wider group of people and offer a range of

products. For the past centuries, informal saving and credit groups have been operating within the world economies. In 1462, in Europe, an Italian monk created the first pawnshop to counter usury practices whereby people were being lent money at high-interest rates (Constant & Ibrahim, 2007). Pope Leon X in 1515 gave authority to those pawnshops to be charging reasonable interest to cover their operating expenses (Helms, 2006).

In the 1700s, Jonathan Swift initiated the Loan Fund System which targeted the poor farmers who could not offer any collateral asset as a security of the loans. In the 1800s, Friedrich Wilhelm Raiffeisen and his supporters in Germany started the concept of the financial cooperative. Thereafter in 1965, the cooperative movement expanded rapidly within Germany and other countries in Europe, North America and later in the developing countries. In the 1900s, the adaptations of this cooperative model began to develop in rural Latin America (Helms, 2006).

The pioneers were Grameen Bank in Bangladesh led by their founder Mohamed Yunus in 1976, ACCION International in Latin America and SEWA in India. In the 1990s, the concept of microcredit began to be replaced by microfinance where more services such as savings and insurances among others were included (Helms, 2006). In the 1950s, there were programs to issue funds and offer credit to the agriculture sector through government-sponsored development financial institutions or farmers' cooperatives by channeling concessional loans or lending to customers with a low market interest rate below normal interest rate (Constant & Ibrahim, 2007).

In the 1970s, programs were extending small affordable loans to organized women's groups to start a micro business and the concept of microcredit came about. In the 1980's, NGOs supported microfinance institutions in East Africa based on the methodology adopted from

Asia that reduces costs and default risks which is more likely with small loans through group lending. The ultimate goal for many MFIs is to offer more credit to wide small-scale people and at the same time to maximize profits. MFIs must maintain optimum liquidity and profitability levels to be able to remain sustainable (Niresh, 2012).

Globally, microfinance institutions have shown great performance in terms of growth in clients and outreach. By the end of December 2017, MFIs had reached an estimated 139 million low-income clients with loan disbursement estimated to be 114 billion dollars all over the world, which was a growth of 5.6% from 2016. South Asia region leads in terms of the number of MFIs and borrowers are estimated to cover 60% of the total borrowers. The MFI industry has shown different trends in growth in terms of loan borrowers. In South Asia, the growth reduced from 13.4% in 2016 to 6.6% in 2017. In East Asia and the Pacific, the borrowing grows from 10.6% to 18.1% in 2017. In America, the loan portfolio was reduced by 1.1% in 2017. In West Africa, the borrowings grew by 0.4% while in Kenya the borrowings reduced by 18% which is attributed to the electioneering period in 2017 (Blaine, 2018).

Shamima, Rajah, Angathevar and Muhammad (2018) noted that the financial performances of Bangladesh MFIs are affected by the depth and breadth of social outreach. The results indicated that financial performance can be improved by targeting organized women borrowers, increasing average loans per borrower and having an increased number of active borrowers. Rupa and Padmaja (2014) noted that in India, MFIs exhibited high financial income generated from their assets, the high yield from the portfolio held and their income covered the operational expenses. The results however showed that the income was not enough to cover financial and total expenses. The MFIs have been faced with challenging

environments over a couple of years because of macroeconomic factors which lowered their financial performance.

In 2016, their global portfolio risk increased to 7.2 % compared to 4.7 % in 2015. For the year 2017, MFIs in Eastern Europe and Central Asia generated losses of 1.1% on ROA. South Asian MFIs on the other hand showed ROA of 3.5% while African MFIs showed ROA of 3.1% with low portfolio quality (Microfinance Barometer Report, 2018). According to Mohita (2019), there is a slow positive growth in the MFIs based on the global trend on assessments of operational and financial results of 762 MFIs worldwide. There is a regional variation that results from difficult regulatory, political and economic environments. Effects of inflation rates in Nigeria in 2015, an interest cap and election cycles in Kenya in 2017 were some of the causes of the decline in value of gross loan portfolio in Africa.

The performance of MFIs in Europe and Asia were also affected by the economic crisis in 2015 where the economy was faced with recession. In the early 1990s, there was a financial crisis in Kenya caused by macroeconomic factors. The international financiers had stopped granting loans and grants to the Kenya government which had resulted to government acquiring funds from the local market. Any attempts by the national government to provide credit was impossible and commercial banks had entirely stopped the issuance of credit to the agricultural sector. In this context, microfinance emerged as a potential solution by providing credit and saving services to the farmers (Stanculesco & Gibson, 2011).

The financial sector in Kenya and especially the banking sector has been faced with a series of different constraints and this has facilitated the growth of microfinance. The key constraints that have been identified include lack of effective structure and the composition of the Kenyan banking sector; inadequate laws and regulations that govern and enhance

quality improvements in banking and, prevailing macroeconomic conditions, among others (Alastair, 2016).

MFIs play a very crucial role in the Kenyan economy as they assist in the achievement of Vision 2030 and the Four Big Agenda goals set by the Kenya government (Central Bank of Kenya, 2018). Microfinance businesses in Kenya are operated under different organizational firms and regulated by different bodies. Microfinance institutions are categorized as formal, semi-formal and non-formal microfinance providers. Large financial institutions like authorized commercial banks, non-bank financial institutions and microfinance institutions are referred to as formal. Co-operative societies, trust funds, NGOs lending funds and state corporations such as the Youth Fund, *Uwezo* Fund, and Women's Enterprise Fund are referred to as semi-formal (Mokoro *et al*., 2010).

Non-formal financial institutions include Rating Savings and Credit Association and Accumulating Saving and Credit Associations who are moneylenders and are user-owned designed to offer products tailored to the needs of their specific communities within their location and their main economic activity (Abd, 2015). Microfinance institutions are managed using the Microfinance Act (2008). The purpose of the Act is to provide the legal, regulatory and supervisory framework for the two broad categories of microfinance namely Deposit-Taking Microfinance Institutions (DTMs) and Non-Deposit-Taking Microfinance Institutions (Central Bank of Kenya, 2008). Deposit-Taking MFIs are further classified as Large MFIs with over 5 % market share, Medium MFIs with between 1-5% market share, and small MFIs with less than 1% market share (Central Bank of Kenya, 2018).

Deposit-Taking Microfinance institutions are licensed and supervised by the Central Bank of Kenya and Non-Deposit Taking microfinance institutions are licensed and supervised by

the Ministry of Finance (Central Bank of Kenya, 2008). There are thirteen registered deposit-taking microfinance institutions in Kenya as of December 2018 and thirty-two non-deposit taking (credit only) institutions that are registered members of the Association for Micro-Finance Institutions of Kenya (AMFI, 2018). Association of Microfinance Institutions (AMFI) is an organization that was created to build capacity and to facilitate self-regulation for the microfinance industry in Kenya. The AMFI's mandate is to enhance cooperation and collective action by registered MFIs and other stakeholders in the microfinance industry, to foster a conducive policy and regulatory environment for microfinance in Kenya (AMFI, 2017).

Emerging trends in the microfinance sector are financial inclusions. These innovations play an integral role in shaping the future of microfinance institutions. The innovations include specialized MFIs that focus on specific demands like farmers only; diversifications of MFI services and products; new channels like branchless banking and franchise-based services and turnkey solutions which include more services like chain management and marketing for micro-business products (Kurnia, 2013).

Kenyan microfinance institutions have experienced significant growth from the period 2011 to 2017. There has been a lot of transformation in terms of an increase in innovations of new services, growth in the number of customers and diversity in the range of services and products offered. There is a notable increase in the number of microfinance institution banks in Kenya from six in 2011 to thirteen in 2017. Their asset base has also increased tremendously from 24.5 billion in 2011 to 72.5 billion in 2016 and their customer's deposits increased from 9 billion in 2011 to 40.1 billion in 2016 (Central Bank of Kenya, 2017).

The Kenya government has initiated various laws and regulations being part of reforms in the microfinance industry. Microfinance Act (2006) was established to give the legal, regulatory and supervisory framework for the microfinance industry in Kenya. In 2008, Microfinance Institutions Regulation (2008) law was enacted for the regulation of the Deposit taking MFIs. Proceeds of Crime and Anti-Money Laundering (Amendment Act) 2012 came into effect and applied to all deposit-taking institutions.

In 2012, there was the establishment of the Kenya Deposit Insurance Corporation (previously known as Deposit Protection Fund Board) with the mandate of providing a deposit insurance scheme for customers of member institutions and to provide incentives for sound risk management and generally promote the stability of the financial system. The Credit Reference Bureau Act (2013) which requires MFIs to share client's information through a licensed credit bureau was enacted. In 2018, the CBK issued a Guidance Note to all financial sector players including MFIs on International Financial Reporting Standards (9) which describes how they are required to compute the regulatory capital (CBK Bank Supervision Reports, 2019).

Despite the various reforms by the Kenya government and growth in the MFIs industry, the industry has experienced a decline in growth in their financial performance within the period, from a cumulative profit of over one billion in 2014 to a cumulative loss of over 600 million in 2018 (Central Bank of Kenya, 2018). The study focused on registered microfinance institutions in Kenya where the context is unique because this category is well regulated and supervised by the Central Bank of Kenya.

1.2. Statement of the Problem

The Kenya Vision 2030 blueprint recognizes that for the country's economy to raise the Gross Domestic Price (GDP) growth rate to at least 10 %, it requires a vibrant and competitive financial service. Microfinance institutions have been identified as a very important industry that provides financial services to small and medium enterprises who are contributing immensely to improving the country's economy. The country must embrace and encourage high levels of savings by increased financial access through the formalization of the microfinance institutions (Government of Kenya, 2008).

To support the 10% growth rate as envisaged in vision 2030, the microfinance industry in Kenya has developed various reforms initiated by the government over several years in line with their rapid growth to enhance their supervisions and to ensure they adhere to statutory requirements (CBK Bank Supervision Reports, 2019).

Despite the importance and reforms in the growth of microfinance institutions in Kenya, they have reported poor financial performance (Central Bank of Kenya, 2019). In 2014, the microfinance institutions reported a combined profit of Kshs. I billion, before the profits declined to Kshs. 592 million in 2015 which was a 169 % decline. In 2016, they reported losses amounting to Kshs. 331 million and in 2017 they reported combined total losses of Kshs 622 million. and in Year 2018, a combined loss of Kshs. 1.4 billion which amounted to a decline of 131 % from 2017 was reported (Central Bank of Kenya, 2017).

Some MFIs including Choice MFB, Century MFB, Daraja MFB and Maisha MFB have faced severe financial issues which led them to breach the CBK minimum statutory requirements on the core capital, signaling financial instability in 2018. Furthermore, the same year Choice MFB failed to meet the required minimum liquidity rate of 20% (Central

Bank of Kenya, 2018). With CBK enhancing their supervision roles, three commercial banks, Imperial, Dubai and Chase banks were put under receivership between 2015 and 2016. Rafiki MFB, being a subsidiary of Chase bank suffered immense reputational damage with low deposit contributions which shrunk to 29% and loan portfolio to 17% in 2016 (Muriithi & Kiarie, 2017).

Previous studies in the microfinance industry seeking to explain market risk, financial leverage and financial performance have shown various gaps. Some studies (Haruna, 2013; Ndegwa, Waweru & Huka, 2016; Kariuki & Ngahu, 2016) have conceptualized market risk variables as performance measures of other types of financial risk, among them default risk or liquidity risk which resulted to mixed results in measuring their relations to financial performance exposing a conceptual gap.

Some studies such as Rahman and Hogue, 2015; Abdellahi *et al.*, 2017; Taufik and Siti, 2019 were carried out in different economies, some in developed economies and others in economies with restrictions and laws that affect market risk variables, among them the Arabic countries where *Sharia Laws* apply. This therefore presents a contextual crisis, as it may be difficult to generalize results to all economies. Some studies have shown conflicting results from known financial theories like International Fisher Effects theory, therefore creating a knowledge dilemma (Ndegwa, Waweru & Huka, 2016; Badawi, 2017). Other studies among them He, Fayman and Casey, 2014; Parlark and Ilhan, 2015; and Moh'd and Kairm, 2017 have adopted different methods of analyzing key variables such as financial performance which resulted to different results and interpretations.

Studies on the MFI firm size, market risk and financial performance have not shown clear interaction between the variables resulting in contradicting findings, and therefore causing

a knowledge gap (Maja & Josipa, 2012; Amelie, 2013; Akinyomi & Olagunju, 2013; Qamar *et al.*, 2016; Olawale *et al.,* 2017). Some studies have indicated that the bigger size of MFIs minimizes market risk and better financial performance (Almajali *et al.*, 2012; Ksenija, 2013). Podobnik *et al.* (2009) found that firm size does not influence the interaction between financial leverage, market risk and financial performance in the long run. Evidence on financial performance studies (Gonzalez & Gaul, 2011; Niresh, 2012; Mirza & Javed, 2013; Harelimana, 2017) mostly dealt with risk management practices and their effect on financial performance.

The empirical literature reviewed showed a mismatch between the growth in number, asset base, customer base and the financial performance of microfinance institutions in Kenya. This study intended to investigate whether market risk variables (interest rate risk, foreign exchange risk and inflation risk) and financial leverage have a significant effect on the financial performance of microfinance institutions as well as the moderating effect of the MFI size on the relationship between market risk, financial leverage and financial performance of the microfinance institution.

1.3 Research Objective:

1.3.1 General Objective

The main objective of the study was to investigate market risk, financial leverage and financial performance of microfinance institutions in Kenya.

1.3.2 Specific Objectives:

i. To determine the effect of interest rate risk on the financial performance of microfinance institutions in Kenya.
ii. To examine the effect of foreign exchange risk on the financial performance of microfinance institutions in Kenya.

iii. To determine the effect of inflation risk on the financial performance of microfinance institutions in Kenya.

iv. To establish the effect of financial leverage risk on financial performance of microfinance institutions in Kenya

v. To examine the moderating effect of firm size on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya.

1.4 Research Hypotheses

The following null hypotheses were developed for the study:

H_{01}: Interest rate risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{02}: Foreign exchange risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{03}: Inflation risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{04}: Financial leverage risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{05}: Firm size has no significant moderating effect on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya.

1.5 Significance of the Study

The findings of this study are anticipated to be beneficial to the Central Bank of Kenya and other regulatory bodies in the financial sector by outlining the effects of various laws and

policies that affect the macroeconomic factors. The findings will also assist them in formulating proper laws and policies. The study will also assist the owners and management of microfinance institutions in understanding the risks involved and the magnitude of their effects on financial performance and therefore help to come up with sound policies and mitigation measures to undertake.

The findings will also be beneficial to the MFIs management, AMFI associations and other stakeholders in the industry as they lobby the government in implementing laws and regulations that are favourable to the MFI industry, to allow them to remain competitive in the financial sector. The study findings also sought to assist the investors in evaluating the MFIs performance and the effects of various market risk variables like the financial leverage and the foreign exchange transactions in determining the risks they will undertake on their investments.

The findings will assist the individual MFIs in formulating various policies concerning the market risk variables in order to determine their capital structure composition and to evaluate where to access loans with competitive rates, so as to maintain a good financial performance. The study will also be beneficial to researchers as it will make a contribution to the already established knowledge by investigating how the financial theories composed of Resource-Based Theory, Extremes Monetary Theory, International Fisher's Theory, Expectation Theory of Exchange Rates and Modern Portfolio theories are applied in the process of market risk and financial performance.

1.6 Scope of the Study

The study focused on MFIs in Kenya registered by the Central Bank of Kenya which were 13 in number by December 2018. The study covered the effects of market risk on the

financial performance of microfinance institutions in Kenya. The study was restricted to financial leverage risk and market risk variables of interest rate risk, inflation risk and foreign currency risk. The study was longitudinal and it used secondary data for the period between 2014 and 2018. This period is significant since it is the period in which the Central Bank of Kenya had put strict measures on supervision and regulation of the financial sector. The study period is also within the Kenya Vision 2030 blueprint timelines where the provision of access to financial service to citizens and small and medium enterprises is one of the key pillars in which microfinance institutions play a key role towards the achievement of this goal.

1.7 Limitation of the Study

According to Ranjit (2011), secondary data have limitations of validity, personal biases and availability of data. To mitigate the limitation on validity, the study obtained secondary data from authenticated sources which were CBK, MFIs audited financial statements and published financial reports. On the issue of subjectivity, the information was obtained from the published audited financial reports rather than from individual diaries.

Another limitation was that there were very few registered MFIs in Kenya during the period under study. To make meaningful statistical analysis, panel data were used to increase the quantity and quality for data analysis. The other limitation is that the study used panel data over a five year period (2014 - 2018), therefore some MFIs were not in existence during this period covered resulting in an unbalanced panel. To mitigate this problem, the study used STATA software, which has the capacity to work with an unbalanced panel.

1.8 Organization of the Thesis

This thesis is organized into five chapters. The first chapter presents the background of the study, the statement of the problem, the objectives of the study, research hypotheses, significance of the study, the scope of the study, limitation of the study, and organization of study in that sequence. Chapter two presents the theoretical and empirical literature reviews on the study topic. These reviews seek to generate research gaps and present the study's conceptual framework. The third chapter presents the research methodology comprising of research philosophy, research design, empirical model, target population, data collection and analysis, diagnostic tests, and ethical consideration. Chapter four presents the research findings and discussion while Chapter five presents the summary, conclusion, the contribution of the study and the recommendations for policy.

1.9 Summary

This chapter discussed the background of the study, the statement of the problem, the objectives of the study, research hypotheses, significance of the study, the scope of the study, limitation of the study and organization of study in that sequence.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the relevant theories supporting the study. It presents a critical review of empirical literature on the study variables including market risk, financial leverage, financial performance and the firm size and summary of research gaps identified for the purpose of contextualizing the study. The conceptual framework is presented in a diagram showing the relationship between market risk, financial leverage and financial performance of microfinance institutions as variables.

2.2 Theoretical Literature Review

This section presents a critical review of theoretical arguments regarding the linkages between the research variables. The study was anchored in six financial theories namely, dynamic capability theory, resource-based view theory, extreme value theory, expectations theory of exchange, international fisher effects theory and modern portfolio theory.

Dynamic capability and resource-based theories were used to determine how an organization utilizes both internal and external resources to achieve better financial performance considering effect of risk. Extreme value theory was used to investigate the effects of inflation risk to financial incomes of microfinance institutions. Expectation theory of exchange rate argued that foreign exchange risk fluctuations interfere with foreign investment income and can be detrimental to the overall financial performance. International fisher effect theory was used to investigate how the interest rate risk variable affects the stability of the financial sector and to determine the profitability of the organization. Modern

portfolio theory argues that the organization has to establish optimal financial leverage levels that maximize their profits for better financial performance.

2.2.1. Dynamic Capability Theory

Dynamic capability theory (DC), which was developed by Teese, Pisano and Shuen in 1997 deals with development and redevelopment of organization's resources and capabilities to address a rapidly changing environment. The theory relates to a process that enables the organization to reconfigure its strategy and resources to achieve sustainable competitive advantage and to achieve a superior financial performance in a rapidly changing environment (Bleady *et al*., 2018).

According to Oliver (2014), the organization needs to utilize useful ideas in order to examine the development of new organizational capabilities, competence and dynamic capability. A dynamic capability-based approach needs to be championed by the organization's chief executive officer in terms of aspirations in corporate strategy. Risk management strategy needs to be incorporated as a key strategy to ensure gains achieved by an organization while seeking to be profitable will not be affected by market risk variables and financial leverage risk.

Teece (2018) observed that strong dynamic capabilities enable creation and implementation of effective business models that lead to improved financial performance. The strength of a firm's capabilities are implicated when the business model changes are translated into organizational transformation. There is need for connections among the elements of the economic system that are mapped out to pathways to profit and better financial performance.

Arndt (2011) observed that DC theory relates to a central source of a firm's competitive advantages. Three key aspects of dynamic capabilities: process, cognitive and decision

based micro-foundation and human agency must be utilized and managed to achieve competitive advantage and to improve overall financial performance.

According to Gorgol (2017), DC theory approach has a lot of polarization, inconsistencies and confusion in meaning. The concept of capabilities, abilities and capacity in the theory and how the organization evaluates the best concept to apply to achieve the best performance is widely misinterpreted and confusing. Peteraf *et al*, (2013) argued that DC approach has a problem of polarization in terms of perspective of dynamic capabilities view in understanding of construct.

Pisano (2015) noted that an underlying problem with DC theory is on how to identify and select capabilities that lead to competitive advantages. There is need to distinguish between investment designed to deepen the firms existing base of capability and those designed to broaden new areas of capabilities. Three areas that help to deal with the above problem of DC theory include competitive circumstances, stable product and market competition.

MFIs must identify their competitive advantages for them to compete in financial markets. They must introduce new and unique products and services that will attract customers and lure them over their competitors and maintain better financial performance. The chief executive officer is a key person who carries the aspirations of the organization and thus the firm must choose the right person. The identification of proper human resource capital to steer the organization will influence their output. Risk management is a key activity the organization needs to embrace so that it will be able to put in place proper mitigation measures especially on the market risk and financial leverage risk that may affect its financial performance.

2.2.2 Resources Based View Theory

Resource-Based View (RBV) is a theory introduced by Barneys in 1991. The theory postulates that organizations are heterogeneous and they possess heterogeneous resources. Therefore, different organizations will apply different strategies to achieve their performance since they possess different resource mixes. The main focus is identification of the firm's internal resources which include assets, capabilities and competencies that will put the firm into a superior competitive advantage (Barney, 1991).

MFIs operate in a business environment that is very volatile and thus they need to determine internal resources and capabilities that will determine their strategic choices to be competitive. The abilities identified by the MFIs will ensure they add value to the customer value chain and will help them to develop new products and successfully enter into new markets which will improve their profitability. Not all resources possessed by firms enable it to have competitive advantages but only those that are different across firms and when there exists resource immobility where there is the inability of competing firms to acquire resources from other firms (Madhani, 2010).

In project management, firms identify how to spread their resources according to alignment with their strategy and capabilities to shape their competitive advantage. Firms need to have a better position in terms of marketing strategy which helps in maximization of the firm's potential and improves the overall performances (Almarri & Gardiner, 2014). An organization uses the dynamic managerial capability on managerial cognition, social capital and human capital in undertaking human resource strategy as indicated by RBV theory. The recruitment of the employees based on the available resources and capabilities leads to better overall performances (Collins, 2020).

Competitive advantages play a major role in mediating the relationship between marketing capabilities and financial performances. Marketing and operational capabilities influences the financial performance of an organization positively (Kamboj *et al.*, 2015).

Kraaijenbrink *et al.* (2010) observed that although RBV helps in the improvement of a firm's financial performances, it is limited to deal with dynamic issues such as boundaries, timing, innovation and entrepreneurship. It puts more emphasis on resources and capabilities and does not explain the timing of when the value has been created and when firms have innovated and generated new sources of sustainable competitive advantage.

Nason and Wiklund (2018) argued that resources which are valuable, rare, inimitable and non-substitutable and efficient are the basis of RBV and do not contribute to the firm's growth and performance. The versatile resources provide a means to exploit opportunities when they are recognized and confer the flexibility to adapt to evolving environmental conditions and lead to a firm's growth and performances.

The organization must identify its internal resources that give them competitive advantage taking into consideration the effects of market risk variables and financial leverage risks that may interfere with achievement of good financial performance. Financial performance being one of the key variables of the study relates well with the theory since the organization needs to remain competitive to maintain good financial performance.

2.2.3. Extreme Value Theory

Extreme Value Theory (EVT) is a theory that was developed in the 1920s by Fisher, Tippet and Von Mises and later was improved by Gnedenko in 1943. In calculus, the extreme value theorem states that if a real-valued function f is continuous on the closed interval [a,b], then f must attain a maximum and a minimum, each at least once. The theory deals with

extreme deviations from the median probability distribution. It is a well-elaborated theory for extreme values and is used in risk management (Coles, 2001).

Avdulaj (2011) noted that the EVT assists in assessment of market risk since it brings out the extent of losses. Market risk management involves assessing how various market risk extreme events affect financial performance. The MFIs must always identify the market risk variables that affect their portfolios under rare events. EVT involves large and rare risks and is used in the estimation of VaR for extreme situations mostly for unpredictable times.

Gilli and Kellezi (2006) observed that organizations like MFIs need to measure the size of extreme gains or losses that are caused by several macroeconomic variables that affect a firm's performance. Risky investors usually assess the variability of the extreme scenario of gains and losses depending on the kind of risk position one is ready to undertake. During the time of inflation, the organizations are faced with extreme fluctuations of their earning leading them to losses and in extreme situations may cause them to close businesses.

Singh, Allen and Robert (2013) observed that EVT theory is relevant to modeling techniques of computation of extreme market risk. The model is used in the computation of the financial performance in terms of return level, value at risk and the expected return shortfall. EVT successfully assists in predicting the finance market returns under market risk. The study noted that EVT is useful in modeling financial risk measurement and to quantify the size of the extreme events.

Muela, Martín and Sanzc (2017) noted that during the financial crisis 2008-2009, financial institutions did not have enough resources to cover market risk losses. The financial institutions were exposed to high inflation and fluctuation of the interest rate. EVT model

was applied to quantify the market risk estimates and their impacts on portfolio returns computed using bond prices.

According to Anghelache, Voineagu, Culeţu and Baltac (2013), market risk is measured using probability distributions of change in market value within a shorter period rather than estimating market risk variables over a long period. EVT applies only in the case where measurements of market risk are computed. Market risk variables affect different assets in a portfolio differently. Any change in inflation rate or interest rate will affect the bond price significantly. An increase in the rate will cause financial assets price to drop and thus investors must be aware of the interest rate volatility.

Forwards and future positions in the international markets are usually affected by the volatility of the foreign exchange exposure. Measurement of the effects of those risk factors was identified as one that influences positions held in the portfolio. The most used model to measure those extreme values is a risk measurement model on the stock market using VaR invented in the 1990s by J.P Morgan. Market risk is one of the major causes of income fluctuations within the MFIs and financial sector at large (Santosa & Laksana, 2011).

The MFI industry has a large amount of their trading activity involving liquid assets and is vulnerable to extreme market movements and this is an area of concern for internal risk controls. The institutions have their trading financial assets determined by market risk requirements and are supposed to assess and compare their capital against their defined market risk (Bank for International Settlements, 2014). Market risk may take extreme forms when certain events that are assumed to be rare in the distribution of assets cause severe changes in the valuation of the portfolio. It is the risk that is faced by the portfolio due to

change in market movements or market-wide risk factors. The rare events may cause large variations in either gain or loss to the value of the portfolio (Gaurav, 2011).

MFIs industry operates in the financial sector which is vulnerable to the effects of inflation rate risk. EVT relates well in how the MFIs can quantify the losses that arise from fluctuations of financial income caused by the inflation risk factor. The organization must identify and mitigate the effects of inflation risk and put into place the necessary risk management practices. The theory relates to predicting the extent of future profits and losses that may arise from the inflation risk effects and in the evaluation of gain or loss of portfolio returns and value. Inflation rate risk is one of the market variables adopted in this study and thus the study is anchored in the theory.

2.2.4. Expectation Theory of Exchange Rate

Expectation Theory of Exchange rate is an economic theory developed by John Keynes in 1930. The theory is also referred to as the theory of 'waves of optimism and pessimism'. It recognizes people's expectations about the future as a central role in determining the business cycle (Mankiw, 2010). The theory was improved further by Craig Hakkio in the 1980s and indicated that the expected spot foreign exchange rate in a future point is the same as the current forward foreign exchange rate for the same maturity. The theory postulates that investors believe forward foreign exchange rates as reflected by future contracts are indicative of future short term rates (Delong & Olney, 2004).

Countries where exogenous terms of trade variables can be properly be identified with ease manage to explain the portion of exchange rate movements. The world price of their commodity exports appears to have a stable and constant impact on the value of their currencies over their floating rate periods. The theory relates to the extent to which

developing economies have commodity prices induce exchange rate fluctuations, spot or future prices signal in the world market and offer additional information for monetary policymaking and inflation control in those economies (Chen, 2009).

Yuchin (2009) noted that future value of interest rate is equal to the summation of all investors or market expectations on the expected returns of a financial asset. When dealing with foreign exchange, the forward exchange rate at any expected future date is equal to the spot rate at that date when there is no risk premium (Yuchin, 2009).

Kallianiotis (2018) argued that it is not only the investor's expectation that determines the exchange rate, but many other factors contribute to the future rate to be different from the current exchange rate. In times of imperfect market, where there is leaked news about expected returns on particular assets, this cause movements in currency exchange rates if the nominal price is slow to adjust. These anticipations of future shocks cause current exchange rate misalignments.

Brink and Smant (2011) observed that the theory does not hold where any country's central bank interferes in the money market, since it causes a decrease in the forecasting power of the term spread and situations where there is possible time-varying term premium. Kalliathe (2018) contended that foreign currency being international money should be treated as an international asset. Their demand depends on the investor's expectations about the net return relative to other currencies and mostly the currency with the highest liquidity premium. The exchange rate adjusts to international trade in the financial asset rather than to international trade of goods. The foreign exchange rate changes every minute or hour depending on the supplies and demands of a financial asset of the different nations thus the exchange rate is more variable than goods prices caused by inflation.

MFI industry operates in a global village where they can access foreign capital funds. Any movement in the foreign exchange between countries may affect the income and interest expenses which impacts on their financial performance. As the theory postulates, the equilibrium foreign exchange currency rate equals to the price levels in the two countries. Fluctuations of the foreign exchange rate between two countries cause investors to shift their investment to the country which has a stable economy and offering better returns. The shift of the investment will result in more foreign exchange earnings in a better economy. The theory relates to this study as a foreign exchange risk is a key market risk variable that affects the financial performance of MFIs in Kenya.

2.2.5 International Fisher Effects Theory

International Fisher Effects Theory is an economic theory that was developed by Irving Fisher in 1930. It states that any expected change in the future spot rate between two countries' currencies results in almost the same amount although in the inverse direction of their nominal interest rate. The theory indicates that a currency of a country with a higher nominal interest rate will depreciate against other foreign currencies due to the increase in the inflation rate in that country (Andrea & Rodrigo, 2015).

According to Hur *et al*. (2018) nominal interest rate is the aggregate of the real interest rate and the expected rate of inflation at any particular period. Any increase in the growth of the money supply will result in an increase in inflation and the nominal interest rate. The effect of change in interest rate will have tremendous effects on the MFIs. The access to loans by the MFIs from commercial banks will be difficult and more costly hence affecting their financial performance. Saeid and Valian (2011) argued that a country's currency with a higher nominal interest rate due to the increase in the inflation rate in their economy will depreciate more against another country's currency with a lower nominal interest rate. High

interest rates cause a decrease in currency value. High interest rates also influence inflation and cause the currency to depreciate.

According to Jeffrey (2005), there is a perfect correlation between nominal interest rate to change in the inflation rate in the short-term, and formation of expectation would lead to the greater impact of expectation on the interest rate. Fama in 1975 developed an efficient market theory using the Fisher hypothesis. The future price changes are mirrored in the current interest rate and thus the evidence of an efficient market. These concurred with Fisher's hypothesis that previous changes in the price level are already reflected in the current rate of interest (Shiller, 2014).

Allen, Carletti and Gale (2014) argued that the International Fisher Effects Theory does not apply for private debt since the rate charged on private debt increases with increase in inflation rate. A standard private debt contract pays a total expected return using nominal interest rate and partly on real interest rate. Firms dealing with foreign investment always speculate on future spot rates for purposes of making profits and they may move the capital from a country with a low interest rate to a country with a high interest rate. The reverse applies to sources of foreign funds. The firm will seek funds from countries with lower interest.

Gietzen (2017) noted that interest rate risk exposure affects MFIs' financial performance and therefore the International Fisher Effects Theory relates well to this study since interest rate risk is one of market risk variables adopted.

2.2.6 Modern Portfolio Theory

Modern Portfolio Theory (MPT) was developed by Harry Markowitz in 1952. It is an investment model where the investors are geared to earn maximum level of returns under a

minimal level of market risk for a given portfolio (Omisore *et al*., 2012). The theory emphasizes that risk is an inherent part of high reward and thus even the risk-averse investor needs to construct a portfolio to optimize or maximize expected returns based on a given level of market risk. Investors need to analyze their investment portfolio and construct an efficient frontier of optimal portfolios which gives a maximum possible return for a certain expected level of market risk (Holton, 2013).

Diogo (2018) noted that MPT revolutionized the investment field by allowing managers to be able to quantify their investment risk and expected returns of the portfolio. Managers are expected to assemble a portfolio with risky assets whose expected returns are better. The theory quantifies risk as to the variance in an asset's expected returns. Jacobs and Levy (2014) argued that investors usually use portfolio optimization with financial leverage constraints to mitigate the risk of leverage and thus leverage aversion should be incorporated into MPT. The investors should be allowed to estimate the level of their optimal leverage since they have a preferential trade-off for their expected returns vis a vis market risk comprising of volatility risk and financial leverage risk. When financial leverage aversion is incorporated, it takes care of portfolio optimization which leads to a portfolio that reflects investor's expectations and preferences.

Funda (2010) argued that stocks with low profit/earnings ratio (P/E) can outperform stocks with high P/E. The P/E ratio is a performance indicator of future returns from an investment. Prices of security are sometimes biased and returns on the stocks with low P/E ratios tend to be higher than warranted underlying risk. William and Khim (2017) noted that small enterprise stocks tend to outperform large enterprise stocks. Firms provide information only necessary for public relations concerning their P/E ratio and firm size, which disallows investor's opportunity to earn excess returns.

Shiller (2014) observed that fluctuations encountered in the stock market were because of noise rather than changes in key economic changes. MPT holds that investment prices include all necessary information and thus volatility is caused by a noisy market which is a result of an emotional crowd. Therefore, instead of risk-return optimization, it's an emotion return optimization.

MPT relates to this study because organizations strive to achieve higher financial performance with minimum risk. The theory identified that different investors have their preferred returns with minimum risk. The understanding of financial leverage risk which is regulated by borrowings of funds or stocks the organization is engaging in affects the expected portfolio returns. Managers must understand the optimal financial leverage the firm needs for maximization of the financial performance beyond which excessive leverage can result in market disruption and economic crisis.

2.3. Empirical Literature Review

This section presents a review of the extensive empirical literature based on the interaction between adopted research variables. Market risk refers to the risk of fluctuations of the market that cause losses of income which is generated by the organization which lead to poor financial performance.The market risk causes losses of income from investment due to fluctuations in macroeconomic conditions. The market risk causes the likelihood of an organization incurring losses or failure to achieve their expected income which is caused by the changes in market risk variables which for the purpose of this study, the market risk variables are interest rate, inflation and foreign exchange.

Financial leverage risk is a mechanism through which debt financing affects the return on equity, return on the rate of benefits which is the net income and equity. Firm size on the other hand, has been identified as a key variable that affects the determinants of financial

performance in an organization. It plays a moderating role when investigating the interactions between various variables with financial performance.

2.3.1 Interest Rate Risk and Financial Performance

Interest rate risk refers to chances that an investment in bonds will suffer losses as a result of unexpected changes in interest rate. It is expected that interest rates will fluctuate up and down causing the value of investment security to shift respectively (Chen, 2020). Unexpected fluctuations in interest rates may have adverse effects on the value of an investment. Several empirical studies have been done on interest rate risk and financial performance.

Odeke and Odongo (2014) observed that interest rate risk affects the financial performance of financial institutions. The study found that combined variation of interest rate risk factors composing of maturity gaps, basis risk, and assets and liabilities margin accounted for up to 14.5% of the variation in the financial performance of the institutions. Maturity gaps and assets and liabilities influence the financial performance positively while basis risk does not have any significant influence. The findings however contradict previous studies by Estasy, Narasimbham and Tufano (1996) and Bourgi (2019) who noted that basis risk has a high influence on financial performance. The current study investigates whether the MFI industry interest rate risk affects the financial sector the same way and to contribute to knowledge in this regard.

Kolapo and Fapetu (2015) observed that interest rate risk does not influence the financial performance of Deposit-taking banks. The study noted that banks perceive interest rates as a price of deposits or cost of borrowings and will not have an effect on financial performance. The results showed inconsistency with previous studies. In recognizing that

the main business of the MFIs is to mobilize funds from customers and access loans from commercial banks, the interest rate risk is one of the major determinants of its financial performance as indicated by previous studies among them Ndegwa, Waweru and Huka (2016) and Badawi (2017).

In the Middle East and North Africa, the financial performance of Islamic MFIs and conventional MFIs was noted to be almost similar. The study observed that both MFIs are affected by the same macro-economic conditions since they operate in the same environment. The financial performance was measured using Return on Investment. The use of *sharia*-compliant products by the Islamic MFIs does not affect their financial performance differently from conventional MFIs (Abdellahi *et al*., 2017).

Galina *et al*. (2015) observed that Russian MFIs were faced with various risks which led to the decline in their financial performances. High interest charged by the MFIs to their customers affects the non-repayment of loans which causes MFIs to have less operating cash flows. The foreign exchange risk causes fluctuations in prices between goods from different countries and thus affects the profits. The interest rate risk pushes the financiers especially the commercial banks to impose higher interest rates on the MFIs leading to high-interest costs and lower financial performances. However, the study ignored other market risk variables like the financial leverage risk which involves the utilization of the debt capital and influences the financial performance of the MFIs.

Kariuki and Ngahu (2016) observed that the interest rate risk substantially influences loan performance. The study noted that interest rate risk measured by liquidity risk and default risk has a negative effect on loan performance. High interest charged by MFIs on loans to their customers leads to loan defaults and hence non-performing loans. When the MFIs

increase the interest rate in terms of the default risk premium and liquidity risk premium, it results in negative effects on loan performance. The study however relied on the manager's responses only without subjecting the test to financial analyses causing a methodological gap. The study used financial risk measures of liquidity risk and default risk as a measure of interest rate risk which causes a conceptual gap.

Ndegwa, Waweru and Huka (2016) noted that interest rate risk affects the financial performance of MFIs. Interest rates charged by MFIs influence the liquidity position of the MFIs and therefore affect their financial performance. The study concluded that any fluctuations in interest rates lead to fluctuations in liquidity and financial performance. The higher interest rate charged by MFIs increases their income which leads to improved profitability and overall financial performance. However, according to the International Fisher Effects Theory, when the firm charges a high-interest rate, borrowers will shift to lower-interest lending firms which can cause a drop in earnings of those MFIs and affect financial performance. The study relied on primary data collected from the questionnaires filled by the MFIs staff. Financial data collected from primary data have some limitations on being comprised and may lack credibility and therefore requires to be complimented with reliable secondary data from credible sources like MFIs published accounts which the current study adopted. Similar studies agree with the above results (Idoliany & Wiryono, 2014; Musiega, Olweny, Mukanzi & Mutua, 2017).

Bengi and Njenje (2016) observed that interest rate affects the MFI's growth. The interest rate level charged by MFIs is a major influence on the level of demand of the credit facility issued. Increased interest rate charged by the MFIs prohibits prospective borrowers to come in bond but will seek for loans with less interest rate like from the commercial banks. The increased interest rate also causes the borrowers with existing loans to pay more and this

leads to more loan default. The study found that interest rate has a negative influence on the growth of MFIs. The study supported the International Fisher Effects Theory which stipulates that increase in interest charges will cause borrowers to seek for cheaper loans elsewhere.

MFI industry is faced with immense competition in the financial market and therefore they must improve on the consumer protection by increasing transparency in their communication of interest rates charged to their customers to become competitive. There is need to promote homogeneity in their interest rate calculation by adopting a standard method as used by other financial institutions like the commercial bank. The interest risk factor affects issuance of loans negatively and also the financial performance. Fair evaluation of MFIs lending interest rate depends on evaluation of final profitability of MFIs against their relevant costs. The minimum lending interest rate level to be charged should enable the MFI to be financially and economically sustainable (Veton *et al.*, 2017).

Badawi (2017) noted that credit risk, liquidity risk, and market risk affect bank profitability. The study observed that market risk measured using interest rate risk influences financial performance. The interest rate risk will arise where the banks will provide loans to their customers for a longer period and with a high-interest rate and thereafter, the interest rate decreases. The net interest margin is an indicator of how the firm has placed its assets in the form of credits. More credit distribution means firms will earn higher interest income and result in more profits. The study used a purposive sampling method. The study conflicts with International Fishers Effects Theory which indicates that where the firm increases their interest rate, the borrowers will shift to other lenders with lower lending rates.

Mbuvi and Wamiori (2017) observed that interest rate risk, credit rate risk and liquidity risk have effects on the financial performance of the MFIs bank. The study found that interest

rate risk affects the returns to the owners or investors and adversely affects the borrowers of loans in the MFI sector. The high-interest rate will weaken the performance of any MFI and this reduces the attractiveness of investment MFI banks. The study concluded that market risk has a positive and significant relationship with financial performance. The study, however, used nonfinancial measures to analyze the relationship between interest rate risk and financial performance, which may bring out a methodological gap. The study covered 4 MFI banks in Mombasa County in Kenya which may hinder the generalization of the results and thus the current study sought to use published financial data and cover MFIs within Kenya. Kihara and Mwangi (2017) concur with the above results that the interest rate charged by the banks to loanees has a positive influence on the bank's financial performance while the interest rate paid to the deposit holders has a negative effect on financial performance.

Murage, Muya and Mogwambo (2018) observed that the effective interest rate charged by the Deposit-Taking Saccos (DTS) influences their financial performance. The study revealed that DTS have adopted an interest rate technique as a strategy to generate income from the loans issued. The findings were that the interest rate has a significant influence on the financial performance of DTS. The study concluded the DTS should review their interest rates regularly to be able to control the borrowing rate and enhance the loan repayment. The study however ignored the fact that other macro-economic factors like inflation rate and the government policy may affect the interest rate charged. Other studies that shared similar views included Ashim & and Ranjula (2013); Flosbach (2014); Lin and Chang (2016).

Inekwe (2019) observed that institutional risk factor is very crucial in the evaluation of an organization's financial performance. The interest rate charged influences the loan repayment and may cause loan default. MFIs have to evaluate the loan repayment

performance and identify macro and micro factors that affect their loan performance. Micro factors that affect the default risk include cost of loan, human capital and time required to start a business (TRB) while macro factors will include human capital and TRB are determinants of default in debt obligations. The study was done from a global pool of MFIs from 106 countries which might not provide generalization of a specific region or a country as the current study will cover MFIs within Kenya.

Indonesia MFIs have been experiencing slow growth in terms of clientele and have shown poor financial performance over time. The MFIs outreach in Indonesia was only 2% of the total population despite the country having the largest Muslim population compared to a growth of 3 % of Syrian MFIs. The poor performance is attributable to *sharia* laws that interfere with the charging of interest rates by the bank. The financial performance was measured using credit and net income (Taufik & Siti, 2019). The study was contextualized in countries where the laws governing their economies have some restrictions on interest to be charged and thus it cannot be generalized in the Kenyan economy.

Several studies have used Cumulative Interest Gap to measure interest rate risk and this study has also adopted it (Idoliany & Wiryono, 2014; Flosbach, 2014; Waseem & Abdul, 2014).

2.3.2. Foreign Exchange Risk and Financial Performance

Foreign exchange risk is a risk that the value of financial assets held as investments may fluctuate due to changes in the value of the two trading countries' currencies. It is a risk to the investor's side borne when disposing of their financial assets held in a foreign currency and they incur losses due to volatility in the foreign exchange rate (Chen, 2020). Rahman and Hoque (2015) described foreign exchange risk as a financial transaction where a country's currency is traded into another country's currency. Foreign exchange risk arises

from fluctuations of the foreign exchange rate during the transactions from the inception of the original commercial contract to the time of settling the consideration of the domestic equivalent of the foreign currency amount.

Most MFIs usually get additional access to loaning funds from foreign countries' currency which is usually favourable and flexible compared to local debt. MFIs with this arrangement of foreign currency loans tend to charge higher lending interest rates since they have incorporated foreign exchange risk in the interest rate. The study concurs with the Expectation Theory of Exchange. Moh'd and Karim (2017) contended that for MFIs having business in countries which have pegged exchange rate regime and those that are for profit-making can put measures to reduce foreign currency risk and be more profitable. The study compared the ratio of foreign currency debts against other local and cross-border sources. The study, however, failed to recognize the fact that the exchange rate on foreign currencies is affected by many other factors like inflation which is incorporated in the current study.

Ngari (2011) observed that foreign exchange exposure affects a firm's financial performance. The study noted that the foreign currency exchange affects import cost and asset payable, export revenue and account receivable with the net effect on the net income of the firm. Firms account for foreign exchange differences in their financial income statement. Unrealized foreign exchange gains or losses affect the firm's net income and owners' equity. A conceptual gap may arise in the use of import, export, and owners' equity as variables to measure market risk. The study included listed financial and investment firms and therefore generalization of the findings on the MFI industry may be difficult.

According to Mbabazize, Twesige and Ekise (2014), foreign exchange risk management plays a major role in the performance management of exporting firms in developing

countries. The study found that there is moderate applicability of the level of foreign exchange risk management which causes a low level of financial performance. Foreign exchange risk management techniques are applied to affect foreign exchange risk and influence financial performance. The study revealed that exchange rate volatility complicates the exporting business and management must identify those risks and implement various methods of reducing them. The findings indicated that the currency risk contributes to good financial performance of the firms thus contradicting the PPP theory. The study also indicated that other sectors among them financial institutions undertake currency risk management strategies like swap contracts, money risk hedging and diversification to minimize the currency risk and to improve their financial performance. The contextual issue may arise since the study was done using the exporting firms and thus the results may not apply to other sectors like the financial sector where MFIs are found. Several studies including Lambe (2015); Aykut (2016) and Gietzen (2017) concurred with these findings.

Jamal, Noor and Ali (2014) observed that foreign exchange risk causes exposure to unanticipated changes between two countries' currencies. Investors and multinational businessmen who do business throughout the global economy are faced with foreign exchange risk and sometimes they encounter severe financial consequences. The findings of the study showed that financial exchange risk has a negative influence on the financial performance of firms and therefore firms realize unpredicted losses. This may contradict the interest rate parity and PPP theories.

He, Fayman and Casey (2014) noted that foreign exchange fluctuations impact bank profitability. The study contended that the value of firms in an economy with a strong currency is positively related to returns generated by the firms from those countries. The

study showed that firm earnings responded positively to changes in values of foreign currency against the stronger US dollar currency. A stronger currency is a reflection of the increased economic activity of a country and firms are not isolated due to the level of international economies caused by the increased global business environment. The study was undertaken in the United States of America and covered 22 commercial banks, therefore it may be difficult to generalize the findings of the study to developing economies and to different industries such as MFIs.

Parlak and İlhan (2015) noted that foreign exchange risk influences the financial performance of manufacturing and service sector firms. The study found that firms with long-term foreign exchange positions showed high operating profits and indicated a better financial position than those with short-term foreign exchange positions. Foreign exchange risk was measured using Net open position rate (FX liabilities – FX assets/Total asset). The study conflicts with Purchase Power Parity theory which postulates that a good financial performance position due to foreign exchange lasts for a short period since in the long run, there will be no significant gains or losses from currency overvaluation or devaluation. The study was carried out in a more developed country and used data from blue-chip companies only and may bring some contextual gaps if generalized in developing countries like Kenya.

Kamau, Inanga and Rwegasira (2015) observed that foreign currency risk has little impact on the financial performance of multilateral banks. The study found that there is an insignificant relationship between foreign currency risk and financial performance. The study causes a knowledge conflict since other reviewed literature such as He, Fayman and Casey (2014); Parlak and İlhan (2015) indicated that currency risks have an impact on the financial performance of banks. According to the Expectation Theory of Exchange Rate, the effect of currency risk will not last in the long run. However, the study indicated the

existence of the exchange gains and losses of MBs. It may be difficult to generalize the result of this study to other private-owned banks since the study was done using government-owned banks in Egypt where some regulations and other factors may influence the results and thus a contextual gap may exist. Other studies that contend with the above study include Kihara and Muturi (2016); Ochieng and Ntoiti (2016); Kemisola, Osundina, Jayeoba and Olayinka (2016); Nzioka and Maseki (2017).

Ahmed (2015) noted that most of the organizations use income account and shareholders capital accounts to record their foreign exchange gain or loss in their books of accounts. The net income is affected by the unrealized foreign exchange gain or loss. Foreign exchange rates have effects on import cost and creditors with a net effect on net income. The Net Open Position was used as a measure of foreign exchange risk.

In a study on whether investment managers add value to MFIs, Mangold (2016) observed that foreign exchange risks or exposure are high inherent risks in the microfinance sector, which needs to be proactively identified and mitigated. Financial institutions usually factor in foreign exchange risk when determining which customer to grant their loan. This risk is caused by countries' currency where the microfinance markets involved are exotic and there are limited or no hedging instruments available within those countries or where they are accessible, they are expensive.

Nzioka and Maseki (2017) observed that firms must put in place mitigation measures to manage foreign exchange risk. The study showed that internal hedging techniques which include netting, lead and lags, invoicing sales, and purchases in foreign currency and money market hedges are more preferred and influence the firm's financial performance. Most researches that examined the relationship between foreign exchange risk and financial

performance have used Net Foreign Exchange Position to measure foreign exchange risk. This study also adopts it in this study (Apgar & Reille, 2010; He *et al*., 2014).

2.3.3 Inflation Rate Risk and Financial Performance

Inflation risk is a risk undertaken by the investor when holding cash in or investing in an asset that is not linked to inflation. It is a risk that cash value will be reduced by inflation risk. It is the probability that an investor might get losses from erosion of income from the investment due to the rising cost of goods and services (Curtis, 2018).

Haroon (2015) observed that inflation risk affects financial development in a country. The study found that inflation risk is influenced by money supply and total level of deposits in the economy and is not affected by the bank credit to the private sector. The findings showed that a high inflation risk in the economy has negative influences on a firm's financial performance. Inflation risk reduces the effectiveness of the financial sector in both the long and short term. The study may conflict with the monetary theory of inflation which indicates that only the issue of money supply matters in relation to inflation. The study did not incorporate other risk factors like interest rate and foreign exchange risk which may affect financial performance as the current study has done.

Vanroose and D'Espallier (2009) found that there is a relationship between MFIs and financial sector development in Belgium. The findings were that inflation has a negative influence on the financial performance of MFIs. High inflation leads to a high cost of operations and this causes low firm profits. This is due to an overall price increase of goods and services caused by the reduction in the customers' saving power. Therefore, MFIs benefit when the formal financial system is stable. The MFIs management should understand the macro-economic environment they operate in since it affects their financial

performance. The study may have a theoretical gap since according to PPP theory, high inflation will lead to investors sourcing funds from a cheaper source and this tradeoff will have zero effects. Since Belgium has a stronger economy, the findings of the study might not apply to developing countries like Kenya.

Yong and Christos (2012) noted that inflation risk influences bank profitability. Empirical findings exhibited inflation to have a positive influence on the firm's profitability. Inflation is sometimes predictable and this enables lending firms to adjust their interest rates and increase their revenues. The study contradicts Keynes' theory of inflation. The study was done in a developed world context and may not apply to developing countries.

Umar, Danjuma and Mohammad (2014) noted that firms, especially in the financial sector, can withstand the effects of inflation risk only in the short-run since they are usually interested in interest and maturity of financial investment without concern about purchasing power. Inflation risk affects purchasing power and bank exchange regimes, and worsens loan policies, disrupts business plans and equity holding performance. An adverse effect of inflation in the financial sectors spills over to the overall economy and distorts the working of the price system causing inefficiency in the allocation of resources.

Adair and Berguiga (2015) noted that inflation is a significant barrier to the development of MFIs. A high inflation rate increases the level of real interest rates and this makes the demand for loans by the borrowers reduced hence it undermines the sustainability of MFIs. High inflation affects real lending interest. MFIs will have to choose whether to use a negative real lending rate or to use a nominal rate that covers inflation. Inflation affects the financial margin of MFIs. The MFIs usually charge an interest rate above the regulatory caps and collection of their deposits seems more effective. The rise in inflation risk affects

the level of lending rates and the MFIs increase their rates to avoid deterioration of loan portfolios. Slower activities cause the MFIs to bear lower profits and overall financial performance.

Siswanti, Eko and Embun (2015) observed how macroeconomic factors impact the firm value and financial performance of firms. The study found that inflation risk has an impact on a company's stock price. The rise in the inflation rate causes the company's stock price to decline. An increase in inflation causes prices of goods to increase which results in an increase in demand for secondary goods which are complementary goods and a decrease in the demand for luxury goods. The study found that inflation has a negative influence on financial performance but no effect on a firm's value. Those results on financial performance and a firm's value seem to contradict other previous studies like Ifeanyi and Chukwuma's (2016) study which may cause a knowledge crisis.

Zulfiqar and Nizam (2015) noted that inflation and interest rate risks affect firms' financial performance differently. The study found that when data is analyzed using correlation analysis both inflation risk and interest risk have a negative effect on financial performance measured using both ROA and ROE. Using regression analysis, the study found that inflation risk influences financial performance positively when measured using ROA while when measured using ROE, there is an insignificant relationship with financial performance which indicated mixed results. The findings that inflation rate risk affects financial performance positively contravenes Keynes' theory of inflation which indicates that inflation slows down economic growth and therefore firms record poor financial performances. The current study will contribute to existing knowledge through research in the area to clear on the mixed results obtained from previous studies.

Anafo, Bright and Luu (2016) noted that inflation risk has an inverse relationship between the issuance of loans and mobilization of funds by MFIs. Many businesses in developing countries are collapsing due to the effect of high inflation. Inflation influences the living standards of people and thus affects the mobilization of their funds and repayment of loans issued to them by their MFIs. An increase in the rate of inflation leads to a devaluation of the country's currency and also the reduction of people's purchasing power. A high inflation rate hinders MFIs' issuance of loans to customers due to low savings by the members.

Ifeanyi and Chukwuma (2016) contend that inflation risk impacts on firm's profitability and affects firms value from a study done on manufacturing firms. The study found that inflation has a negative relationship with the firm's value whereas it has an insignificant influence on firm profitability. The study concluded that firms should ensure that when choosing the right viable investments or the purchase of fixed assets they should incorporate inflation rate to be able to arrive at a realistic net present value. Positive inflation was found to be invaluable in the survival and growth of firms. The result contradicts some previously reviewed studies (Yong & Christos, 2012; Haroon, 2015) exposing an existing knowledge gap. The study results might not be generalized since it was done in a different sector of the economy from the financial sector where MFIs operate.

Pacini, Mayer, Attar and Azam (2017) found that macroeconomic factors influence a firm's performance in the United Kingdom. The study noted that the inflation rate has a direct and positive impact on a firm's financial performance. The study used the top 100 blue-chip firms. Inflation was measured using the Domestic Producer Price Index. An increase in inflation causes the production amount to increase and high profitability was achieved. This study contradicts the PPP theory which indicates that in the long run, the effect will have

zero effect. The study also causes some knowledge conflict since it contradicts previously reviewed studies (Vanroose & D'Espallier, 2009; Zulfiqar & Nizam, 2015).

Caro (2017) investigated the main determinants of MFIs' success in a macroeconomic context by identifying the impact of the aggregate factors of a country's economy. The study used macroeconomic variables which are inflation, GDP growth, unemployment rate and foreign direct investment as independent variables whereas performance was measured using operational adequacy. The findings were that those macroeconomic variables have an insignificant influence on the performance of the economy. These findings may cause a knowledge gap as they contradict other studies that were reviewed such as Siswanti, Eko and Embun (2015); Adair and Berguiga (2015). The study also contradicts Keynes' theory of inflation as well as the PPP theory. This study adopted the inflation risk premium as a measure of inflation risk as it has mostly been used by empirical studies.

2.3.4 Financial Leverage Risk and Financial Performance

Financial Leverage is the degree to which a company uses fixed-income security such as debt and equity to finance its operations. It is a risk to investors caused by an increase in debt and equity in the organization's capital structure (Marin, 2019). Financial leverage risk is the possibility of disproportionate losses related to the amount of interest expense where the borrower does not earn sufficient returns to offset the interest expenses (Daniela & Mircea, 2012).

Nimalathasan and Pratheepkanth (2012) found that there is a direct relationship between financial and operating leverage and profitability. Improved financial leverage which is highly geared and with better operating leverage positions have a positive influence on the profitability and the overall financial performance. According to Asefa (2017), any increase

in financial leverage has a negative influence on MFIs profitability. Profitability is associated with a reduction in financial leverage. MFIs that earn high profits increased levels of internal financing by using their retained earnings rather than increasing borrowings. The study causes a knowledge conflict considering the previously reviewed studies. A theoretical gap arises since it contradicts the capital structure theory which indicates high geared firms usually earn high returns. The study used purposive sampling in the collection of the data which researchers argue may have biasness unlike the current study that applied census sampling.

Wabwile, Chitiavi, Alala and Musiega (2014) found that financial leverage has an insignificant impact on the financial performance of banks. The study found that most firms are financed by long-term and short-term liabilities and hence return on asset and capital employed is reduced to cater for the outstanding liabilities. One limitation in this study was that the study was done from commercial banks from TIER 1 which have an asset base of over 100 billion and thus applicability to other institutions like MFIs may not be possible.
Alshubiri (2015) observed that business risk and financial risk have a significant impact on the performance of firms. Financial leverage used as a measure of financial risk has a negative and significant effect on financial performance. It covered data from twelve different sectors in the Sultan of Oman. The study results were inconsistent with the previously reviewed studies (Vijitha, 2016; Mohammeda & Knapkovaa, 2016). Generalization of results from a study done from 12 different sectors may cause contextual issues considering there may be other underlying factors affecting those sectors.

Abubakar (2015) observed that financial leverage has a great influence on the financial performance of deposit money banks. The findings were that there is a negative relationship between Financial leverage and financial performance. 84% of total assets of 11 deposit

money banks under the study were financed by debts thus highly leveraged. The study concluded that the optimal debt-equity ratio should be maintained by banks to improve financial performance, survival and to remain competitive. The study may cause a knowledge gap as it is inconsistent with the preceding study by Hussan (2016).

The study by Abubakar (2015) also contradicts the portfolio theory which indicates that you can achieve high financial performance as long as you can maintain optimal risk and high-risk financial assets offer better returns. The majority of MFIs have embraced and employed debt financing. MFIs have managed to generate enough returns from their operations which are sufficient to repay borrowed debts from lenders and at the same time ensuring they are left with enough funds for maintaining sustainability over a long period. The study also found that the credit methodology employed by MFIs impact negatively on financial leverage.

Mohammeda and Knapkovaa (2016) observed that total risk management affects a company's financial performance. The study found that total risk management has a positive influence on financial performance. However, when financial leverage is used as a control variable, the result showed that financial leverage affects financial performance negatively which is a result of long-term debt commitment. The lower average cost of capital leads to better financial performance. These results contradict the study from Daniela and Mircea (2012). Financial leverage was conceptualized differently as a control variable which could cause different results as when conceptualized as independent variables as in the current study. The study was done in a different economic bloc and therefore the results may not apply to the Kenyan economy.

Vijitha (2016) observed that financial leverage affects financial performance. A higher level of financial leverage results in a higher level of financial risk. The results showed that financial leverage has a positive and significant influence on financial performance. Managers must make important decisions on how the firm is to be financed whether to use low debt or preferred stock based on expected returns of equity. Beyond a certain optimal level, the cost of leverage tends to outweigh the benefits accrued from financing using debts. Financial leverage and firm size are determinants of financial risk. The study contradicts the Modern Portfolio Theory which indicates that the capital structure of a firm is influenced by the type of investors depending on their risk positions. If they are risk-takers they would go for high gearing and higher returns.

Hussan (2016) examined the impact of financial leverage risk on financial performance. The findings showed that financial leverage has a positive impact on sales revenue, earnings before interest and tax and earning per share of the firm. The study noted that financial leverage is the long-term debt financing that improves the permanent finance and success of the organization. Debt financing increases the share price of a firm indicating a positive earning ability and wealth maximization. Firms that use Financial Leverage increase their investment capacity and enjoy tax exemption facilities. MFIs like any other organization must determine how they will finance their financial assets, either by debts or by equity. The study contradicts the capital structure theory that indicates that the gear will increase the earnings up to an optimal level after that any additional will lead to a decline in the earnings.

The results however contradict many preceding studies (Abubakar, 2015: Hussan, 2016: Asefa, 2017) and may cause a knowledge gap. Although the study was done within the financial sector, different industries may be affected differently like the MFIs and thus

contextual issues may arise. Some of the previous studies concurred with the study (Enekwe, Agu & Eziedo, 2014; Waweru & Wanyoike, 2016).

Most of the studies that investigate the relationship between Financial Leverage and performance have shown a lot of inconsistency in their results and thus further research is necessary. The study adopted the Interest Coverage Ratio as a measure of Financial Leverage as it has been used by most of the preceding studies.

2.3.5. Market Risk, Financial Leverage, Firm Size and Financial Performance

The firm's size is determined by the number of workers, largeness of operations, market share and outreach. This study referred to firm size as the scale of operation in terms of annual turnover, asset base and many customers (Ololube, 2016).

Podobnik, Horvatic, Petersen and Stanley (2009) analyzed quantitative relations between return, risk and firm size. The study noted that both risk and return measured using the growth rate decreases with an increase in the organization's size. The average growth rate decreases faster than the risk with market capitalization which represents the size of the company. The organization must understand the optimal size in maintaining a balanced risk-return tradeoff for improved profitability. The study contradicts the growth of firm theory which highlighted that the growth of firms is attributable to inherited resources the firms had when it was acquired and not the firm size.

Ksenija (2013) investigated how large and medium-sized firms manage their profitability during periods of recession in Serbia. The study found that a firm's size plays a critical role in determining profitability. The bigger and more liquid the firm, the easier it is to access resources and the faster the flexibility to the changes in the dynamic market. Company profitability is influenced by the company's size, liquidity, sales growth and asset

management efficiency. The study may contradict the Resource-Based Model theory which indicates that heterogeneity in profitability is a result of persistent differences in characteristics across companies. The heterogeneity is pure because of differences in resource endowment. The application of unique, rare, and costly assets that other companies are difficult to get or imitate results in a difference in profitability and not the size of the firm. The study was done during a time of recession and may not be applicable during other periods when there are favourable economic conditions.

Babalola and Volodymyr (2013) observed the effect of firm size on the profitability of manufacturing firms in Nigeria. The study noted that firm size is a major determinant of profitability. The larger the firm the more profitable it is since it enjoys the benefits from economies of scale. The study conceptualized firm size as a predictor variable and found that it has a positive influence on financial profitability. When the firm size is treated as a control variable on the relationship between leverage and financial performance, the leverage has a negative influence on financial performance. The study may cause a knowledge gap since it contradicts a previous finding by Hussan (2016) which found that financial leverage has a positive impact on sales revenue and financial performance. The study contradicts the hypothesis of efficiency theory which indicates that profitability is caused purely by management and asset management efficiency. Mixed results may arise when the size is treated as either a control variable or a predictor variable and thus the current study will use Baron and Kerry's (1986) method which subjects the firm's size to test as a predictor variable and control variable when testing the moderating factor.

Atif and Qaisar (2015) studied the moderating effect of firm size on the relationship between firm growth and the firm's profitability in Pakistan. The study found that firm size has moderating inspirations on the relationship between the two variables. The results also

showed that firm size as a predictor variable also influences financial performance. The study may cause some conceptual conflicts since firm size from empirical studies is a measure of a firm's growth. Ali *et al.* (2016) found that firm size does not moderate the relationship between management participation and the financial performance of an organization.

King'ori, Kioko and Shikumo (2017) concurred with the above results from Babalola and Volodymyr (2013). The study examined various determinants of the financial performance of MFIs. The study found that firm size has a positive influence on the financial performance of Kenyan MFIs. Firm size was treated as an independent variable in the study. Abdellahi *et al.* (2017) observed that there is a relationship between financial leverage, liquidity, and firm size on the financial performance of non-financial firms in Kenya. The study found that an increase in growth of firm size by 0.57% caused a 1% growth to financial performance measured by ROA. This shows firm size influences financial performance.

In their study, Mutunga and Owino (2017) observed that size as a moderating factor causes a positive influence on the relationship between the micro factors and financial performance. The results also showed that firm size as an independent variable has a positive influence on financial performance. The study may cause some methodological gaps since it analyzed qualitative data instead of financial data when analyzing financial performance. It might also raise the contextual gap since it was done on manufacturing industries and might be difficult to generalize in all sectors. The results are similar to those of previous studies (Hussan, 2016; Abdellahi *et al.,* 2017).

Several studies that carried out researches on the relationship between firm size and financial performance used firm size as a moderating variable (Mutunga & Owino, 2017; Mutende,

Mwangi, & Ochieng, 2017). The performance measure of firm size has been used as a natural log of total assets thus the researcher adopted it for this research study.

2.4 Summary of Literature Review and Research Gaps

Many empirical studies have been carried out on financial leverage, market risk and financial performance. A review of the empirical literature presents several research gaps as shown in the Table 2.1 below.

Table 2.1: Summary of key studies done in the area of study and their research gaps

Author (s)	Purpose of the Study	Key Findings	Research Gaps	How the study will fill the gaps
Abubakar (2015)	To investigate the relationship between financial leverage and financial performance of deposit money banks in Nigeria.	Financial leverage has a negative effect on financial performance. 84% of MFIs are highly leveraged. Credit methodologies employed by MFIs influence FP negatively.	Used Deposit Taking banks	Incorporated other market risks variables. Used firm size as a moderating variable
Badawi (2017)	To examine the effect of credit risk, liquidity risk, and market risk on the profitability of foreign exchange banks in Indonesia.	Net interest margin affects financial performance. Loan default rate and loans are written off as bad debts affect the interest income and FP	Purposive sampling was used.	Used census sampling method. The study used Cumulative Interest Gap as a performance measure of Interest.
Gietzen (2017)	To examine the exposure of MFI to liquidity, interest rate and foreign exchange risks.	MFIs are affected by interest rate risk due to interest rate sensitivity in developed countries. MFIs rely majorly on foreign capital.	Purposive sampling method used. Study done in developed economy.	Census method used. Study was done in a developing economy.

		Foreign Exchange exposure have minimal and insignificant exposure to the MFI performance.		
Kamau and Njeru (2016)	To establish the effect of liquidity risk on the financial performance of Listed Insurance Companies in Kenya.	Operational, market and credit risks have a negative effect on the financial performance of insurance companies. Interest rate risk cause fluctuations in assets value. Firms stock prices influence foreign investments.	Conceptualized market risk as a performance measure of liquidity risk. Study done in insurance industry.	Conceptualized inflation rate, interest rate, Financial Leverage, and foreign exchange risk as measures of market risk. Study done in MFI's industry.
Ksenija (2013)	Investigated how large and medium-sized firms manage their profitability during periods of recession in Serbia.	The firm's size treated as a predictor variable determines the firm's profitability. Bigger firms have many benefits including access to liquidity and are flexibles to changes in dynamic markets.	Study was done during the recession period.	Firm size conceptualized as a moderating variable between market risk and FP. Study was done for five years to take care of different economic conditions within those periods.
Mbuvi and Wamiori (2017)	The main objective of this study was to examine the effect of financial risks on the corporate value of microfinance banks in Kenya with a focus on microfinance banks in Mombasa Town.	Interest rate risk, credit risk, liquidity risks have a significant positive relationship with the corporate value of microfinance banks in Kenya.	Financial data collected through questionnaires to management. Focused on MFIs within Mombasa County only.	Secondary data collected from MFIs published financial statements and Central Bank Supervisory reports. Used all registered MFI banks in Kenya.

		Interest rate affects MFIs returns, rate of borrowers and weakens FP.		
Muriithi, Muturi and Waweru (2016)	The objective of the study was to assess the effect of market risk on the financial performance of commercial banks in Kenya.	The results showed financial leverage, interest rate, and foreign exchange exposure have a negative and significant relationship with the bank's profitability.	Study focused on commercial banks only.	Focused on MFIs
Namasake and Karanja (2016)	The objective of the study was to assess the effect of market risk on the financial performance of commercial banks in Kenya.	Financial leverage, interest rate and foreign exchange exposure have negative and significant relationships with bank profitability. Firms' market prices are affected by variations from the movement of market risk variables.	Focused on commercial banks only.	Focused on MFIs. Included the firm size as a moderating variable.
Ndegwa, Waweru, and Huka (2016)	Influence of interest rate on financial performance of MFIS in Imenti North Sub County, Kenya.	Interest rates charged by MFIs significantly influence the loan to customers. The high-interest rate charged influences liquidity and FP.	Focused on MFIs in a Sub-county in Meru. Financial data collected through a questionnaire.	The study covered all registered MFIs in Kenya by CBK. Secondary data collected from published accounts and Central Bank of Kenya supervisory reports.
Ngari (2011)	The effect of foreign exchange exposure on a firm's financial performance: A case of listed companies in Kenya.	Listed firms use the income statement to record foreign exchange differences. Unrealized foreign exchange profits or losses affect net income and the owner's equity.	Conceptualized on foreign exchange only Study focused on listed investment and financial firms.	Conceptualized inflation rate, interest rate, Financial Leverage, and foreign exchange risk as measures of Market risk. Study done on MFIs industry.

Njuguna, Gakure, Waititu, and Katuse (2013)	To establish the effect of financial risk management strategies on the growth of the microfinance sector in Kenya.	Financial risk management strategies are a significant determinant of growth in MFIs. MFI uses both internal and external sources of funds. Financial leverage using foreign funds has a positive influence on financial performance.	Study was done on financial risk management. Financial leverage used to measure financial risk management.	Study to be done on market risk and financial performance. Financial Leverage risk conceptualized as a measure of market risk.
Pacini, Mayer and Altar (2017)	Macroeconomic factors and firm performance in the United Kingdom.	Gross domestic product, inflation rate and the rate of domestic debt interest payments to total income tax have a direct positive impact on firm performance. Exchange rate, interest rate and the rate of short term foreign debts to central bank international reserves have an inverse impact.	The study was done on industrial firms. Study used exchange rate, interest rate and rate of short term foreign debts.	The study used firms from financial sectors to review the results. Conceptualized inflation rate, interest rate, financial leverage, and foreign exchange risk as measures of market risk.
Parlak and Ilhan (2016)	Foreign exchange risk and financial performance of manufacturing and service industry: The case of Turkey	The operating profitability of the firms with short foreign exchange position was lower than the operating profitability of firms with long foreign exchange position. The magnitude of foreign exchange risk affects the liquidity and	The study was done in a developed country. Study focused on manufacturing and service industry.	Focused on MFIs in Kenya. Study done in developing economy. The study used a net position to measure foreign risk exposure on FP for results comparison.

		does not affect profitability.		
Vanroose and D'Espiller (2009)	Relationship between the performance of microfinance institutions (MFIs) and the development of the formal financial sector in Belgium.	MFIs reach more clients and are more profitable where access to the formal financial system is low. High inflation affects the MFIs' financial performance negatively. MFIs benefit when there is formal stability of financial systems.	Study done on developed economies.	Study done on developing economy. Conceptualized inflation rate, interest rate, financial leverage and foreign exchange risk as measures of Market risk.
Wabwile, Chitiavi, Alala and Musiega (2014)	Analyze and compare performance amongst commercial banks listed on NSE concerning their financial leverage.	Financial leverage has a negative and insignificant effect on performance. A high degree of financial leverage leads to higher payment of interest and lower profitability.	The study included only tier 1 commercial banks.	The study done on registered MFIs by CBK in Kenya. Study included other market risk variables in addition to financial leverage.

Source: Author (2019)

2.5. Conceptual Framework

A conceptual framework is a research tool that helps in the creation of awareness and understanding of the research scenario under study. The conceptual framework diagram assists the researcher in deriving insightful meaning from subsequent study findings. The conceptual framework in Figure 2.1 below shows the relationship between financial leverage risk, market risk, firm size and financial performance of microfinance institutions in Kenya.

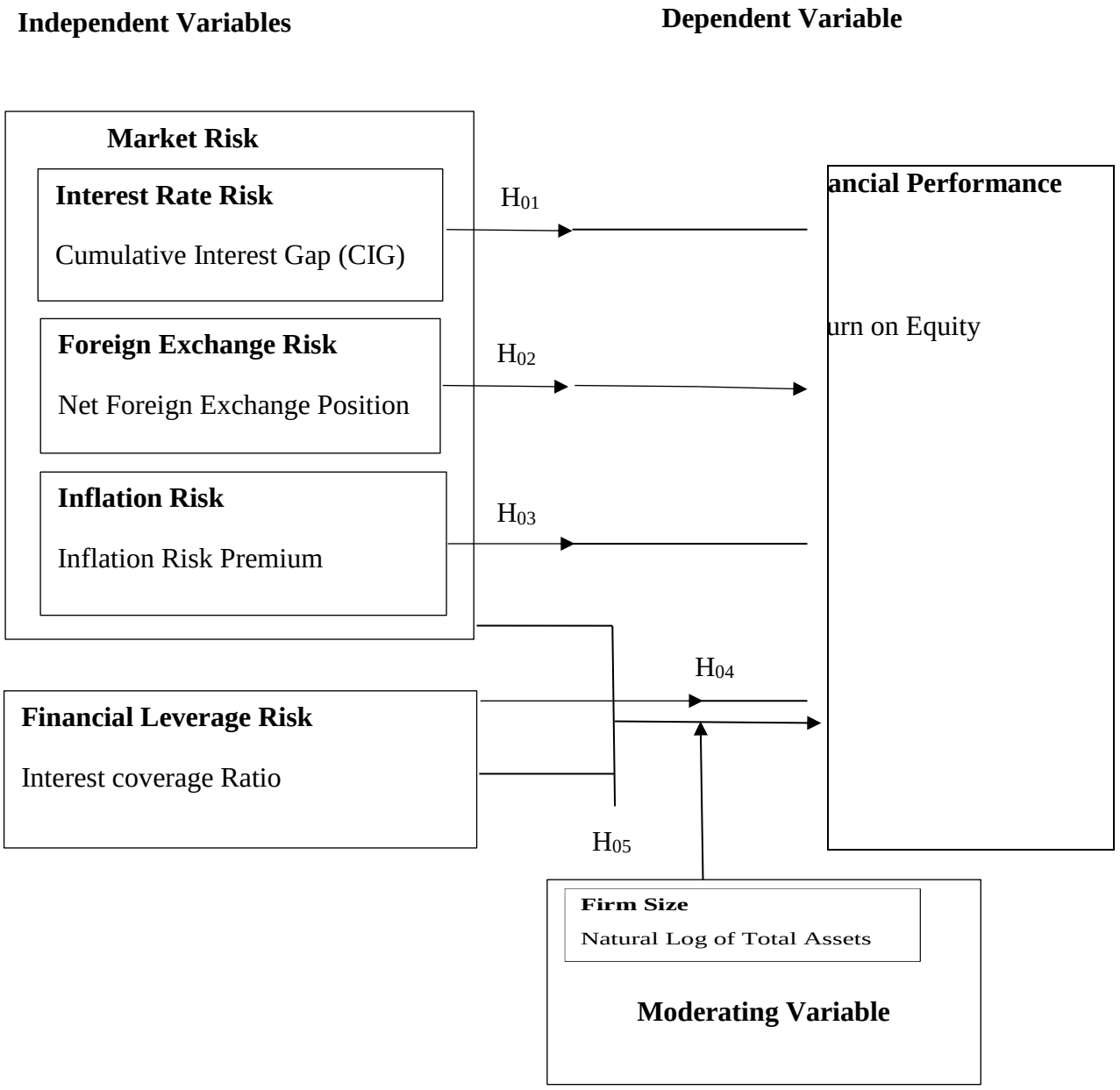


Figure 2.1 Conceptual Framework

Source: Author (2019)

The conceptual framework for the study was made of market risk variables comprising of interest rate risk, inflation risk and foreign exchange risks and financial leverage risk, which were considered to be independent variables of the study. Market risks and financial

leverage are premised to affect the dependent variable financial performance which was measured using Return on Equity.

ROE is preferred in this study since it shows the impact of an organization's financial performance on shareholders' wealth as stipulated by Wet and Tiot (2010). ROE is also a better measuring indicator of financial performance since it evaluates the returns generated from the shareholder's investments. By comparing the company's ROE to the industry average, one highlights the company's competitive advantage. It also provides an insight into how management has utilized financing from equity to grow their business.

The effect of the market risk and financial leverage, and financial performance was considered to be moderated by MFIs size as described in Chapter two. The above figure 2.1 shows how the construct of interest interconnected with each other in a graphical representation. The relationships between these variables are depicted using five sub-models.

Interest rate risk depicted to affect financial performance. Cumulative Interest Gap was used as a measuring indicator of Interest rate risk. The second sub-model has the effect of inflation risk measured using inflation risk premium on the financial performance of the MFIs. The third sub-model has the effect of foreign exchange risk on the financial performance of MFIs. A Net Foreign Exchange Position was used as a measuring indicator of foreign exchange risk. The fourth sub-model depicted financial leverage risk measured by the Interest Covering Ratio was depicted to have an effect on the financial performance of MFIs.

The moderating effects of MFIs size on the relationship between market risk, financial leverage risk and financial performance were presumed to be the fifth sub-model. The natural log of assets was used as an indicator of size.

2.6 Summary

In this chapter, theoretical and empirical literature review was done to support the study. Six financial theories related to the study were reviewed with Dynamic Capability theory being the main theory. Empirical literature reviewed involved all variables used in the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was adopted to determine the effect of market risk on the financial performance of microfinance institutions in Kenya. The sections include research philosophy, research design, empirical model, target population and sampling design. It also includes data collection and data analysis, diagnostic tests and ethical consideration.

3.2 Research Philosophy

Research philosophy involves the development of knowledge, the nature of that knowledge and research methods related to techniques used to gather and analyze data (Saunders *et al.*, 2009). Research philosophy is a system that the researchers develop from their thoughts on the way to carry out their research which may or may not be acceptable by all researchers and their applications depend on individual perceptions (Pranas, Jolita, & Regina, 2018). A research paradigm, on the other hand, is a basic set of beliefs or worldview that guides research action or investigation. The paradigms are necessary because they provide beliefs and define a research philosophical orientation (Kivunja & Kuyuni, 2017).

A research paradigm is a broad framework which comprises of perceptions, beliefs and understanding of theories and practices. It is an established model accepted by many researchers and it has become a generally accepted law (Pranas *et al.*, 2018). The study adopted the positivist paradigm where it assumes that in understanding the world the environment and events of interest are objectives, external and independent of the researcher (Bryman & Emma, 2003; Khan, 2017). Positivism was used in this study since it sought to

use existing theories of finance to develop a hypothesis that was tested. It involved considering research issues and concludes using a quantitative approach.

3.3 Research Design

A research design is a procedural and sequential way to identify and solve a specific identifiable problem which researchers undertake during their work of analyzing, interpreting and forecasting phenomena (Rajasekar *et al*., 2013). According to Saunders *et al*. (2009), research design can be classified into exploratory, descriptive and explanatory. An exploratory research design is aimed at establishing whether what is being observed or researched can be explained by any existing theory and it further lays the groundwork that will lead to future studies. According to Mugenda and Mugenda (2003), a descriptive survey research design allows the researcher an opportunity to capture a population's characteristics and test hypotheses.

The study adopted an explanatory non-experimental research design. The design was adopted since according to Dudovskiy (2018), explanatory research design establishes causal and effect relationships between study variables. Non-experimental research on the other hand, is an empirical inquiry that is procedural where the researcher cannot manipulate the predictor variables. Kerlinger and Lee (2000) stipulate that an explanatory non-experimental research design can be applied in a situation where the study attempts to understand the behaviour of diverse phenomena, by establishing the contributing variables that usher in the change in it without applying any further analysis on the variable.

3.4 Target Population

According to Mugenda and Mugenda (2003), the population is a discrete set of cases or things or people identifiable by at least one common characteristic for a purpose from which

a sample is taken. The target population is the specific population from which the study will derive the desired information.

For the purpose of this study, the population is all the microfinance institutions registered in Kenya which include both Deposit-taking and Non-deposit taking microfinance institutions. The target population was all registered Deposit-taking microfinance institutions in Kenya which are registered under the Microfinance Act (2006) and are registered members of the Association of Microfinance Institutions of Kenya by December 2018. As of 31st December 2018, there were 13 registered Deposit-taking microfinance institutions in Kenya and they were under the supervision of the Central Bank of Kenya All these MFIs were registered members of the Association for Microfinance Institutions of Kenya (AMFI, 2018).

3.5 Sampling Design and Procedure

According to Saunders *et al*. (2009), the use of the census approach as a sampling design enhances the validity of the collected data. In choosing the census approach, the study should consider practicalities, the nature of the study and the population involved. The study adopted a census approach because of the small number of MFIs under the study.

3.6 Data Collection Instrument

The study used panel data from the MFIs financial statements for the years 2014 to 2018. According to Ranjit (2011), secondary data is possible where information is available and is derived from reliable sources. The method is used in quantitative research where information is extracted in categorical or numeric form. Secondary data can be extracted from either internal or external sources to the organization and the data is very useful since

it has a lot of information for research and problem-solving. The secondary data must be current otherwise obsolete data will not meet the specific needs of the intended research.

The dependent, independent and moderating variables used in the study were all measurable using financial ratios which were available in their financial statements and thus provided justification for using secondary data. Panel data for the MFIs which was a combination of both time series and cross-sectional data were extracted. The cross-sectional data consisted of the MFIs and the time series included the period between 2014 -2018. The combination of time series and cross-sections enhances the quality and quantity of the data to a level that individual dimensions could not achieve (Gujarati, 2003). The study used data review instruments which are in Appendix 1.

Table 3.1 contains a list of the various study variables, their operational definitions and the measurements which were used to estimate these variables. The measures adopted have been used and validated by other researchers.

Table 3.1. Operationalization and Measures of Variables

Variable	**Type of Variables**	**Operationalization**	**Measurement**
Financial Perform-ance	Dependent Variable	The ratio of Net income generated by the MFIs from the operations within the year over the Total	ROE = Net income / Total Shareholders' funds

		Shareholders' funds held.	
Interest rate risk	Independent Variable	Measurement of fluctuations to the income caused by the difference between the interest-bearing assets (Risk Sensitive Asset) and Interest-bearing liabilities (Risk sensitive liabilities) over the total assets.	Cumulative Interest Gap = (RSA – RSL) / Total Assets
Foreign exchange risk	Independent variable	Foreign exchange exposure is covered by the net foreign position against the shareholder's funds.	Foreign Exchange exposure = (FX Assets– FX Liabilities) / Shareholders' funds
Inflation rate risk	Independent variable	Unpredicted losses from erosion of investment income caused by the difference between the nominal interest rate	Inflation Risk Premium = 1 + Nominal Rate / 1 + Real Rate - 1

		charged by the MFIs against the real rate from ordinary bonds and yield from government.	
Financial Leverage Risk	Independent variable	Calculate how the total earnings from the operations covers against the interest expense paid for Debt Capital	Interest covering rate = EBIT / Interest expenses
Firm size	Moderating variable	To measure MFIs asset base	Measured by taking the logarithm of total assets of each MFI

Source: Author (2019)

Table 3.1 describes how the study variables were operationalized and measured. The dependent variable which is financial performance was measured using the ROE. The independent variables consisted of market risk variables comprising interest rate risk measured using the cumulative interest gap, foreign exchange risk measured using the net foreign position and Inflation risk measured using the inflation rate premium, and financial leverage risk measured using the interest covering ratio. The firm's size which was the moderating variable was measured using the logarithm of total assets.

3.7. Test of Validity

Validity is involved with ensuring that the findings and conclusions of the research study have integrity. It ensures the instruments measure what it purports to measure. One must measure the accuracy of the data and whether it represents the required variable or construct in the study by testing the validity (Mugenda & Mugenda, 2003). According to Robinson (2002), validity represents the extent to which findings and results obtained from the analyzed data would be a representation of the total population or phenomenon's understanding. In the research field, validity can be classified into two type's namely content validity and criterion validity which are relevant to the research instrument to be used.

Content validity represents how the data collection instrument covers the required study and criterion validity shows whether the measuring instruments will be able to measure what it is supposed to measure (Field, 2009). To ensure content validity of the secondary data, the researcher must ensure there is a clear list of the aspects that identify the dominant content of the research study, identify the correct measuring instruments, and make sure the observed measurements can be a representative sample to cover the domain content (Don, 2010).

The study ensured face validity, content validity and construct validity by using the significant variables as financial performance (dependent), market risk (independent), and firm size (moderator) from numerous past studies that used the same test as one being evaluated. Construct validity was observed by including all the variables that were derived from the literature in the data collection instrument.

3.8 Data Collection Procedure

An authorization letter from the university was sought to confirm the researcher was authorized to carry out the research study. A research permit was obtained from National

Commission for Science, Technology and Innovation (NACOSTI) to authorize the researcher to carry out the research in Kenya before embarking on data collection.

The researcher wrote a letter requesting the Central Bank of Kenya (CBK) supervision division and the management of individual MFIs for additional information that was not available in the published reports. The researcher used document collection instruments presented in Appendix 1 to extract and compile the required data for analysis from the financial statements. The specific financial statements from which the data were extracted include the income statement, statement of financial position and the notes to the accounts from the published MFIs annual financial reports and the CBK annual bank supervision reports. Denice and Cheryl (2010) indicated that the secondary analysis of existing data is efficient and economical because data collection is typically the most time consuming and expensive part of the research project.

The data collection was undertaken between January and February 2020. The researcher undertook the responsibility of extracting the data from the financial report to ensure the validity and correctness of the data.

3.9 Data Analysis

Data collected was analyzed using descriptive statistics and inferential statistics. According to Mugenda and Mugenda (2003) and Muathe (2010), descriptive statistics usually summarize the data using the mean and standard deviation. It was used to summarize and profile the status of financial leverage risk, market risk, financial performance and firm size. Inferential statistics, and specifically panel multiple regression analysis was carried out to test the nature of the relationship between financial leverage risk, market risk and financial performance of microfinance institutions in Kenya. The market risk was measured using interest rate, inflation rate and foreign exchange. ROE was used to measure the financial

performance of MFIs in Kenya. To ensure the study has a suitable model, the study carried out several diagnostic tests. The tests were important to ensure the model does not violate the assumptions of the Classical Linear Regression Model (CLRM). The diagnostic tests carried out include multicollinearity, heteroscedastic, autocorrelation, stationarity, normality, and random and fixed effects estimation.

To ensure the study achieves a better conclusion, the researcher undertook several careful steps to reduce the possibilities of committing Type I and Type II errors. According to Sheskin (2020), Type I error occurs when the null hypothesis is rejected when in fact it is true while Type II error occurs when the null hypothesis is not rejected when it is false. In real life application of errors, a Type I error is considered to be the most serious to commit and to avoid than a Type II error. In this study, the focus was to minimize the occurrence of both types of errors by applying the census approach to the population. To compliment that, the researcher also compared the Present Values (PVs) with the significance level of 5 percent. The PVs are important in estimating the probability of committing Type I error in the hypothesis**.**

3.10 Empirical Model

Several models are available which could be used in analyzing quantitative data: logistic, probit, Tobit, discriminant analysis, and regression models. Logistic, probit, and Tobit are used when the dependent variable is dichotomous (Field, 2009 & Muathe, 2010). In this study, the dependent variable was continuous, and thus panel multiple regressions models were used. The model was applied to test the relationships between the various variables to understand the strength of each predictor variable.

Panel multiple regressions analysis entails evaluation of the effects of one or more independent variables and a dependent variable whose measures are continuous (Brooks,

2008). Market risk variables and financial leverage risk under the study were used to explain their influence on the financial performance of the MFIs where market risk variables were measured by interest rate, foreign exchange and inflation rate and as such panel multiple regressions were used in this study (Wooldridge, 2002).

Panel multiple regression includes bringing together many predictor variables into a single regression equation. Thus, the effect of multiple predictor variables on the dependent measure was assessed as recommended by Jackson (2009). The goal of analysis for using this model was to find the best fitting and most parsimonious reasonable model to describe the relationship between the dependent variable financial performance and a set of independent variables including market risk variables and financial leverage.

The panel multiple regression model used in the study was adapted from Beck (2009) as indicated below:

Equation 3.1 was used for the estimation of the Financial pPerformance measure

$$ROE_{it} = \beta_0 + \beta_1 IRR_{it} + \beta_2 FER_{it} + \beta_3 INF_{it} + \beta_4 FLR_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots 3.1$$

In which:

ROE_{it} = Dependent variable - Financial performance of MFI_i at time t,

β_0 =The model constant or intercept,

β_i =The coefficients of the independent variables

β_5 =The coefficients of the moderation variable

IRR_{it} = Interest rate risk of MFI_i at time t,

FER_{it} = Foreign exchange risk of MFI_i at time t,

INF_{it} = Inflation rate risk of MFI_i at time t,

FLR_{it} = Financial leverage risk of MFI_i at time t,

ε = Idiosyncratic error term (assume normal distribution)

3.10.1. Test for moderating effect of Firm Size

The study used Baron and Kenny's (1986) model on testing the moderating effect of Firm size on the relationship between market risk, financial leverage and financial performance of a microfinance institution in Kenya. The procedure entailed the perceived moderating variable being tested as an independent variable and then as a moderator variable or interaction term. MFI size was introduced to the model as an explanatory variable assuming a multiplicative Cobb Douglas functional form between the predictor and predictable variables then the model.

Testing for the moderating effect was analyzed using two models, 3.2 and 3.3 below as proposed by Baron and Kenny (1986). The first model 3.2 tested the effect of the independent variables (MR, FLR & Firm size) on the dependent variable (financial performance). The second model 3.3 tested whether the coefficient of the interaction term (MR* Firm size) and (FLR*Firm size) were statistically different from zero as adopted from previous studies done (Sarma & Pias 2011; Musau *et al.*, 2018). The coefficient for interaction term strengthens and directs the moderator.

To determine the moderation effect of firm size on the relationship between the market risk, financial leverage and financial performance, the following model was used:

$$ROE_{it} = \beta_0 + \beta_1 MR_{it} + \beta_2 FLR_{it} + \beta_3 Mv_{it} + \varepsilon_{it} \quad \text{.....3.2}$$

$ROE_{it} = \beta_0 + \beta_1 MR_{it} + \beta_2 FLR_{it} + \beta_3 MV_{it} + \beta_4 (MR_{it} * MV_{it}) + \beta_5 (FLR_{it} * MV_{it}) + \varepsilon_{it}$..... 3.3

Where: ROE_{it} = Measure of the financial performance of MFI_i at time t

MR_{it} = Represents the composite value of market risk (Interest rate risk, Foreign exchange risk, Inflation rate risk)

FLRit = Financial Leverage Risk of MFI_i at time t

Weighted averages procedure was used to compute the composite value from the three market risk variables using the following equation as previously used by other studies (Musau *et al*., 2018):

The formula for the Arithmetic mean is expressed as:

$MR_{it} = \sum (W_1 IRR_{it} + W_2 FER_{it} + W_3 INF_{it}) / 3$……3.4

Where: W_1, W_2, W_3= Relative weight given to each component in a particular variable

MV_{it} = Firm Size of MFI_i at time t

$MR_{it} * MV_{it}$ = Interaction of Market risk variables and Firm Size

$FLR_{it} * MV_{it}$ = Interaction of Financial Leverage and Firm Size

β_0 = Constant term

βs = Coefficients of the explanatory

ε_{it} = Error term

Table 3.2 below summarizes the criteria that will be used to decide if MFI size moderates the relationship between financial leverage, market risk variables and the financial performance of MFI in Kenya.

Table 3.2: Decision Criteria for the Moderation Analysis

Analysis	**Outcome**	**The criterion for Decision making**
Step One: Equation 3.2 Firm Size as Independent variables	Significant coefficient of the Firm Size variable	Firm size is an explanatory variable
	Insignificant coefficient of the Firm Size variable	Firm Size can moderate the relationship between market risk, financial leverage and financial performance of MFI in Kenya
Step Two: Equation 3.3 Firm Size as a moderator variable	Significant coefficient of Firm Size	Firm Size moderates the relationship between market risk, financial leverage and financial performance of MFI in Kenya
	Insignificant coefficient of Firm Size	Firm Size does not moderate the relationship between market risk, financial leverage and financial performance of MFI in Kenya
	Significant coefficient of interaction terms (MR* MV)	Firm size is a moderator in the relationship between market risk and financial performance

Insignificant coefficient of interaction (MR* MV)	Firm size is not a moderator in the relationship between market risk and financial performance
Significant coefficient of interaction terms (FLR* MV)	Firm size is a moderator in the relationship between financial leverage risk and financial performance
Insignificant coefficient of interaction (FLR* MV)	Firm size is not a moderator in the relationship between financial leverage and financial performance

Source: Author (2019)

3.11. Diagnostic Tests

When estimating the study models and equations, the researcher must ensure that the study does not violate the assumptions of the classical linear regression model (CLRM). In case there is any violation of CLRM assumptions, the study will have a risk of getting biased, inefficient and inconsistent parameter estimates in the equation (Chatterjee & Hadi, 2012). Diagnostic tests were conducted in this study to have a proper specification of the above equations. The diagnostic tests that were carried out include multicollinearity, autocorrelation, normality, heteroscedasticity, stationarity tests, and random and fixed effects estimation.

3.11.1 Stationarity test

Stationarity is the first crucial statistical analysis done for time series data because most statistical models assume that the underlying generating processes must be in a stationary

state. If the underlying process is not stationary then the data need to be transformed to ensure the process will have a weak stationary (Cromwell *et al.,* 2011). Stationarity tests check if the statistical properties of a time series do not vary with time. A stationary time series arises when statistical properties do not vary with time (expectation, variance, autocorrelation).

The study adopted Fisher-type unit root test. This test is based on the Augmented Dickey-Fuller approach where it estimates that the null hypothesis shows that each series in the panel contains a unit root while the alternative hypothesis allows for some (but not all) of the individual series to have unit-roots. When there is a detection of non-stationarity in the data, it will be rectified using the square root or log transformation which will assist in stabilizing the non-constant variance of a series (Kocenda & Cerny, 2017).

3.11.2 Normality Test

The general assumption is that the error term follows the normal distribution and variance is constant and any other tests of significance such as the standard errors and t-tests are anchored on the assumption. Normality tests are linked with the understanding that the null hypothesis from the total population where the sample for the study is to be extracted follows the assumption of a normal distribution. If the p-value associated with a normality test is less than the risk alpha, any other distribution following this is abnormal (Asghar & Saleh, 2012).

The study used skewness and kurtosis to measure normality. A z-test was applied. For a population of fewer than 50 items, a z-score for skewness and kurtosis larger than 1.96 will result to reject the null hypothesis and to conclude that the distribution is not normal. When

there is non-normality of the data, logarithmic transformation will be used. This reduces the variability of data in a data set where there are outliers. The log transformation usually transforms the skewed data to approximately conform to normality (Changyong *et al.*, 2014).

3.11.3 Multicollinearity

Multicollinearity describes a situation where there are possibilities of high intercorrelations among the independent variables. Multicollinearity causes data disturbance such as indeterminate regression coefficients and infinite standard errors which make the statistical inferences derived from the data unreliable. This study used the Variance Inflation Factor to test for multicollinearity.

According to Pawlicz and Napierala (2017), when interpreting the VIF results, if the critical value is higher than 10, it shows the presence of multicollinearity. Where multicollinearity is detected, one should remedy it by considering removing one of the correlated independent variables from the model or estimating the two separate models.

3.11.4 Autocorrelation

Autocorrelation is a correlation between the variables of some observations at different points of time mostly for time series (Bahadur, 2017). Panel data analysis usually has a problem with serial autocorrelation and it must be identified for one to estimate a correct model specification. In a panel model, the researcher must examine and identify the presence of serial correlation idiosyncratic error otherwise the results will lead to biased standard errors and parameter estimates which are unreliable. When autocorrelation is observed in the residuals of a model, then the model is not proper (Green, 2008).

The study used the Wooldridge test to examine the presence of serial correlation within the panel data. A generalized least square (FGLS) estimation procedure can be undertaken if serial autocorrelation will be detected in the study data (Wooldridge, 2002).

3.11.5 Heteroscedasticity

Heteroscedasticity is a situation where the variance of errors in a model differs for all observations in linear regression or for time series analysis. It contravenes assumptions of CLRM which state that the variances are homogeneous and that the errors of the model are identically distributed (Jim, 2019). When the errors or residue of the model in linear regression are not homoscedastically estimated using ordinary least squares (OLS), the results from those model coefficients are neither unbiased nor those with minimum variance. The estimation of their variance is questionable (Neil, 2010).

This study adopted the Likelihood Ratio (LR) test to test the panel data level heteroscedasticity. When heteroscedasticity is detected, the remedy is to add the residual of the original model as a predictor and rebuild the regression model or to use the Ordinary Least Square estimate to estimate the parameter of the model. To correct the estimate of variance and covariance of the OLS estimate to be consistent (Ullah, 2016).

3.11.6 Fixed or Random Effects Estimation

When the researcher is dealing with the estimation of the panel data model, they have to check and identify whether the data has static or dynamic specifications. The researcher must determine whether to run the fixed effect model or random-effects estimators to check the static or dynamic specifications when dealing with panel data (Green, 2008). To make that decision, the Haussmann specification test was used. The test examined the endogeneity in panel data.

If the Haussmann test identifies the fixed effect model as an appropriate model, then the researcher has to undertake a test for the inclusion of time fixed effects in the study estimation. In this test, if the dummies for all the years are equal to zero and if found so, then there is no need for time fixed effect in the specification of the model to be estimated (Mishra, 2019). The random-effects model is used to curb biases and errors that may arise by assuming that intercept occurs at random outcome variables (Greene, 2008).

Table 3.3: Summary of Diagnostic Tests

Diagnostic test	Statistical Technique	Interpretation/Decision criteria
Fixed or Random effects estimations	**Haussmann Specification Test** Denoted as H, used to determine whether to run the fixed effects or the random-effects model. Has a chi-square distribution with degrees of freedom equal to the number of regressors in the model.	At a 5% conventional significance level, a P-value less than 5% implies that the two models are statistically different hence the null hypothesis can be rejected.
Multicollinearity	**Variance Inflation Factor** Used to test for the correlations between variables	A critical value below 10, indicates no multicollinearity. If above 10, presences of multicollinearity.
Autocorrelation	**Wooldridge test**	F- Test. If at 5% significance level PV > 0.05, then reject the null hypothesis and conclude serial autocorrelation exists.

	To test the presence of serial correlation within the panel data	
Heteroscedasticity	**Likelihood Ratio Test** To test the panel data level of heteroscedasticity ie, test whether an error term is constant or not.	LR has a χ^2 - distribution with d.f. r, If PV> 0.05 you reject the hypothesis of coefficient stability
Normality Test	**Skewness and Kurtosis** For estimation of normality of the residue before the estimation of the model	If Z- scores > 1.96 Reject Ho (Non-Normal Distribution)
Stationarity test	**Fisher – type unit root test** The test checks if statistical	Trends hypothesis shows each series in the panel contains a unit root while the alternative hypothesis allows for some (but not all) of the individual series to have unit-roots.

	properties of a time series vary with time

Source: Study data 2019

3.12 Tests of Hypotheses

According to Kothari (2004), a research hypothesis is a predictive statement capable of being tested by scientific methods that relates an independent variable to some dependent variable. The significance level is the threshold of determining whether to reject or not to reject the Null hypothesis in the study. The study used 5% significance level. If the computed P-Value is higher than 0.05, then we fail to reject the null hypothesis and we conclude that the independent variable does not have significance effect on the dependent variable at 5 % significance level.

Table 3.4 below summarizes the hypothesis tests that were conducted to achieve the objectives of the study.

Table 3.4: Test for Hypotheses

STUDY OBJECTIVE	HYPOTHESES	STATISTICAL MODEL	THRESHOLD OF RESULT INTERPRETATION (5% significance level)

To determine the effect of interest rate risk on the financial performance of microfinance institutions in Kenya.	Interest rate risk has no significant effect on the financial performance of microfinance institutions in Kenya.	$ROE_{it} = \beta_0 + \beta_1 IRR_{it} + \beta_2 FER_{it} \beta_3 INF_{it} + \beta_4 FLR_{it} + \varepsilon_{it}$	P-Value > 0.05 (Accept H0) P–Value < 0.05 (Reject H0)
To examine the effect of foreign exchange risk on the financial performance of microfinance institutions in Kenya.	Foreign exchange risk has no significant effect on the financial performance of microfinance institutions in Kenya.		P-Value > 0.05 (Accept H0) P–Value < 0.05 (Reject H0)
To determine the effect of inflation risk on the financial performance of microfinance institutions in Kenya.	Inflation risk has no significant effect on the financial performance of microfinance institutions in Kenya.		P-Value > 0.05 (Accept H0) P–Value < 0.05 (Reject H0)

To establish the effect of financial leverage risk on the financial performance of microfinance institutions in Kenya.	Financial leverage risk has no significant effect on the financial performance of microfinance institutions in Kenya.		P-Value > 0.05 (Accept H0) P–Value < 0.05 (Reject H0)
To examine the moderating effect of firm size on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya.	Firm size has no significant moderating effect on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya.	$ROE_{it} = \beta_0 + \beta_1 MR_{it} + \beta_2 FLR_{it} + \beta_3 MV_{it} + \beta_4 (MR_{it} * MV_{it}) + \beta_5 (FLR_{it} * MVit) + \varepsilon_{it}$	P-Value > 0.05 (Accept H0) P–Value < 0.05 (Reject H0)

Source (Author 2019)

3.13 Ethical considerations

The researcher undertook various precautions to ensure that the study adhered to research ethical standards. First, research authorization was obtained from St. Paul's University Board of Postgraduate Studies. Second, a research permit was sought from the NACOSTI

to allow for the use of secondary data from the CBK Bank Supervision reports and the MFIs' published annual financial reports. Findings will ultimately be shared with NACOSTI as per one of the conditions of the issuance of a research certificate. The NACOSTI permit attached in Appendix II was to help address ethical concerns on collecting data (where consent has been provided). Thirdly, a request from the MFIs management was sort to obtain additional information that was not available from the financial statements. Finally, the data collected was treated strictly as private and confidential with use only for academic research.

3.14 Summary

This chapter explained the research methodology used. All the procedures that the researcher has undertaken, including the research design, data collection and data analysis to data presentation have been discussed here.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study on the effect of market risk and financial leverage to financial performance of microfinance institutions in Kenya. The chapter begins with a presentation and discussions of the descriptive statistics. This is followed by the results of the diagnostic tests. The chapter then concludes with inferential tests results and discussions and a summary of the tests of the hypothesis. The results are presented in form of tables and narrations.

The data analyzed herewith was gathered from the secondary source. The secondary data was extracted from the MFIs published accounts and from CBK annual bank supervision reports through data collection instruments in Appendix 1. The relevant data was collected from the 13 MFIs registered by CBK for five years from 2014 to 2018.

4.2 Descriptive Statistical Analysis

This section presents the descriptive statistics for the study variables, return on equity, interest rate risk, inflation rate risk, foreign exchange risk, financial leverage and firm size. Descriptive statistics present the summaries and discussions of the main characteristics of the study variables.

The following Table 4.1 shows descriptive statistics for the data used in the analysis.

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Return on Equity	65	-1.083578	5.243931	-40	.692552
Interest Rate Risk	65	.1227288	.0699077	-.0071942	.3979933
Foreign Ex. Risk	65	21.24164	149.7341	0	1200.357
Inflation Rate Risk	65	.0601538	.0204987	0	.08
Financial Leverage	65	-4.14125	12.64767	-59	3.25
Firm Size	65	2.749775	1.129199	0	4.507222

Source: Study data (2020)

As indicated in Table 4.1, the mean value of Return on Equity showed -1.0836 for 65 observations with a standard deviation of 5.24394 and minimum and maximum of -40 and 0.692559 respectively. A negative minimum value of observation signifies that MFIs generated losses during the period under study. According to CBK (2018), the financial performance of MFIs showed a high decline of income generated within the years on study from a cumulative profit of one billion in 2014 to a cumulative loss of 300 million in 2018. The shareholders' funds however remain almost constant within the period with a cumulative amount of 10.6 billion in 2014 to 10.442 billion in 2018.

From the results in Table 4.1, the mean value of interest rate risk was 0.1227 with a standard deviation of 0.0699077 with a minimum and maximum of -0.071942 and 0.3979933 respectively. The mean value indicated that on average the MFIs managed to generate incomes from the borrowed funds that outweigh the interest paid to their customers and their financiers with no much variation as indicated with the standard deviation value. The

minimum values of – 0.0072 indicated that some MFIs that could make enough income from investments and issuances of loans to customers to cover interest paid from financier. A maximum indicator of 0.3980 shows a positive trend to generate more income. According to CBK (2018), during the year 2018 alone, the MFIs received fees and interest from their loan portfolio amounting to 10.395 billion and they paid interest and fees to customers and borrowed funds amounting to 2.607 billion.

The results in Table 4.1 further indicated that, the foreign exchange risk had a mean value of 21.2416 with a standard deviation of 149.7341. This indicated that the MFIs that dealt with foreign exchange transaction had a better net foreign position. The foreign investment income outweighed the foreign liabilities paid out. A minimum of 0 and a maximum of 1200.357 explain that almost all MFI did not have the foreign exchanges variable.

The results in Table 4.1 also indicated that inflation rate risk had a mean value of 0.0602 and a standard deviation of 0.0205. This is an indicator that on average, the inflation rate risk was low within the period with less variation among the MFIs. The MFIs base their inflation risk from the same real interest rate charged by government risk free securities. A minimum of 0 indicates that some MFIs are estimating the risk premium in a moderate manner compared to others. A maximum of 0.08 showed most of MFIs incorporated a high-risk premium to the interest rate on the borrowed fund to their customers.

The results of Table 4.1 indicated a mean value of financial leverage of - 4.1413 and a standard deviation of 12.6477. The negative mean value indicated MFIs are not highly geared. A standard deviation of 12.6477 indicated the variability in which various MFIs fund their operations. A minimum of -59 indicated some of MFIs generated very low income that could not cover the interest paid out. On the other hand, a maximum of 5.5 shows there

were quite a number of MFIs that generated enough interest to cover the interest paid out to customers and borrower.

The positive mean under firm size of 2.7498 and standard deviation of 1.1292 showed that MFIs indicated a steady growth on the asset base within the period. The MFIs had an asset base of 56 billion in 2014 and the asset base grew to 70.7 billion in 2018. Firm size was estimated using the total assets held by the MFIs within the period under study. A minimum of 0 indicated that within the period under review, some of MFIs were inexistent. A maximum of 4.5072 showed some MFIs hold more asset base than the others. Additional descriptive analysis was carried out using trends.

This section presents results on the following: trend on analysis for the variables financial leverage, market risk variables, firm size and financial performance of microfinance institutions in Kenya. It presents the trends and associations between the variables in the study. The panel data was composed of both cross-sectional and time series. The annual means obtained from each variable is used as a representative figure for the entire industry.

4.2.1 Trend in Financial Performance

Financial performance was measured using the ROE and the trend is as indicated below:

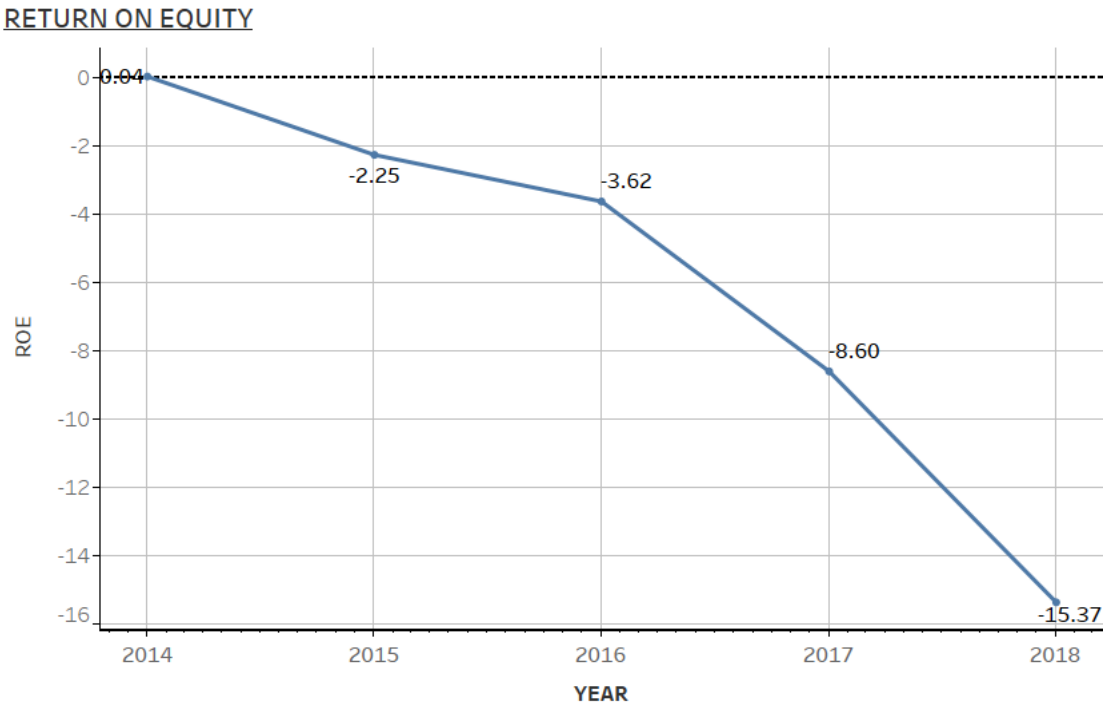


Figure 4.1: Trend in Financial Performance

Source: Study data (2020)

In figure 4.1, the vertical axis represents the financial performance measured using the ROE. The horizontal axis represents the time series measured in years. ROE is the ratio between EBIT and the total shareholders' funds. The minimum ROE indicated was negative 15.37 and the maximum ROE achieved was 0.04. The figures showed that throughout the period under the study, ROE had a declining trend. From the CBK Supervisory Reports for the period under the study, the total EBIT over the period was Kshs. 1.906 billion, Kshs. 1.73 billion and Kshs. 400 million for years 2014, 2015 and 2018 respectively against the shareholder funds of Kshs. 10.6 billion, Kshs. 11.6 billion and Kshs. 10.4 billion. This trend indicates that although the MFIs generated profits within the period, they could not generate

enough income to maximize the shareholders' funds. The overall financial performance was on the downward trend within the period.

According to CBK (2018), the MFIs showed a steady decline of income generated within the years on the study from a cumulative profit of one billion in 2014 to a cumulative loss of KES300 million in 2018. The shareholders' funds however remain almost constant within the period with a cumulative amount of KES10.6 billion in 2014 to KES10.4 billion in 2018. According to Porters' Five force analysis, various factors contribute to poor financial performance attributable to the competition in the financial market. MFIs compete largely with commercial banks that offer similar services and products. Most commercial banks have financial muscles and therefore they manage to offer attractive rates to the customers making the competition too hard for the MFIs. In Kenya, the financial sector is faced with many unregulated players like Saving and Credit Societies and shylocks who offer similar services and products to customers using legal and some illegal ways, mostly in terms of offering loans on holding customer's assets like electronics.

The Central Bank of Kenya established various reforms to enhance the supervision of MFIs during the period among them to increase MFIs minimum core capital and liquidity ratio (Central Bank of Kenya, 2018). This caused the MFIs to seek funds purposely to meet the CBK regulations instead of seeking the funds for the issuance of loans to their customers and other investment. This drastically affected the financial performance of the microfinance institutions.

Muriithi and Kiarie (2017) noted that with CBK enhancing supervision in the financial sectors, three commercial banks were put under receivership in 2016. As a result, one of the MFI which was a subsidiary of one of those affected commercial banks suffered immense

reputational damage that led to low deposits from the customers and difficulty to access funds from other financiers.

Mohita (2019) observed that the introduction of interest capping rate in 2016 and the period of electioneering in 2017 in Kenya caused a decline in the value of loan portfolios of MFIs in Kenya. This resulted in poor financial performances of the MFIs. Although the MFIs were not subjected to the interest rate capping, the reduction of the rate made the loans from commercial banks more attractive to customers than those of the MFIs. Therefore, the reduction of the customers on their products could have caused them lower income**.**

4.2.2 Trend in Interest Rate Risk

The figure below indicates the trend of interest rate risk.

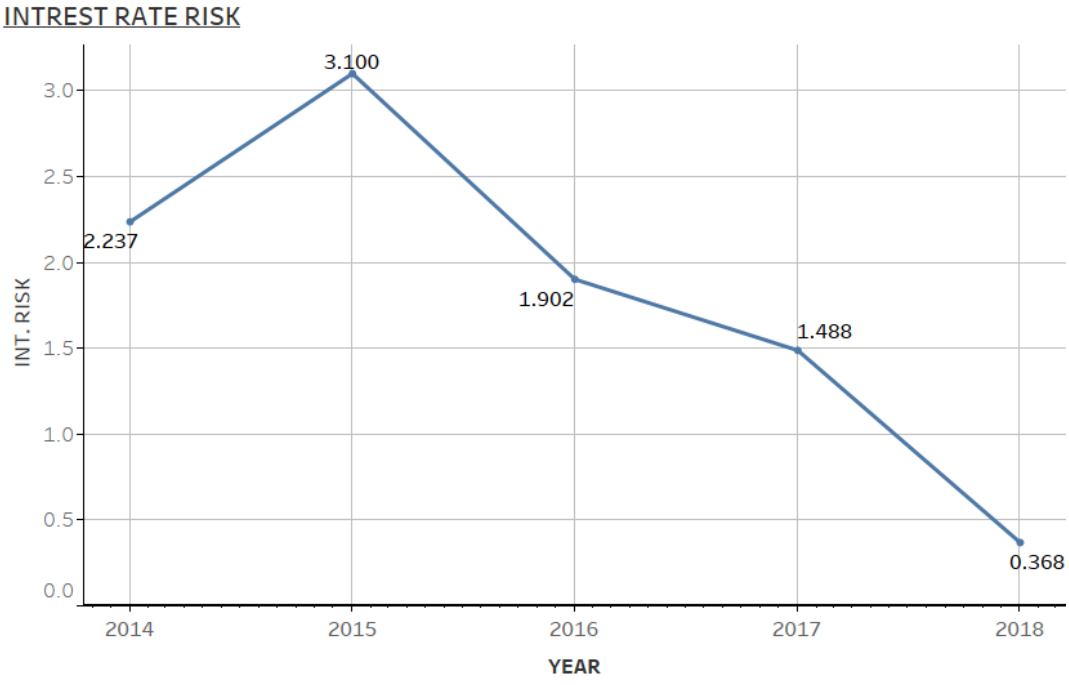


Figure 4.2: Trend in Interest rate risk

Source: Study data (2020)

Figure 4.2 indicates the trend in interest rate risk within the period. Interest rate risk was measured using the cumulative interest gap. The cumulative interest gap indicates the ratio between risk-sensitive assets and liabilities over the total assets. The figure showed an upward trend between the years 2014 and 2015 and thereafter a steady decline in interest rate risk for the rest of the period.

The ratio explains that MFIs had more risk-sensitive liabilities than assets which shows that the MFIs held more borrowed funds than what they had managed to invest to generate more income. The management of the MFIs needed to expand their marketing strategies more on their products and services to bridge the gap. Ashim and Ranjula (2014) observed that the high-interest rate charged by firms discourages customers to acquire a loan and causes poor financial performance. The high-interest rate charged also results in more loan defaulters which reduce the firm's income.

The declining trend from 2016 can also be attributable mostly to the enactment of the interest rate capping law which came into effect in 2016. The MFIs were able to access more funds from financial institutions using the capped lending rate hoping they would offer their customers higher interest rates. The period showed a mismatch between the risk-sensitive assets and liabilities implying that the borrowed funds were more than the borrowings issued to customers.

Ndegwa, Waweru and Huka (2016) observed that interest rate risk affects the financial performance of MFIs. Fluctuations in interest rates lead to fluctuations in liquidity and financial performance. The management should note that higher interest rate charged by MFIs to their customers increases their income and overall financial performance. MFIs

management needs to evaluate the optimal rate of interest to offer to be attractive in the competitive financial market.

Mbuvi and Wamiori (2017) observed that interest rate risk affects the returns to the owners or investors and adversely affects the borrowers of loans in the MFI sector. The interest rate risk subjects the MFIs to utilize a lot of generated incomes in repayment of loans and their interest which weakens their financial performance. Poor financial performances of any firm reduces the attractiveness of the investors.

4.2.3 Trend in Foreign Exchange Risk

The figure below shows the trend in foreign exchange risk.

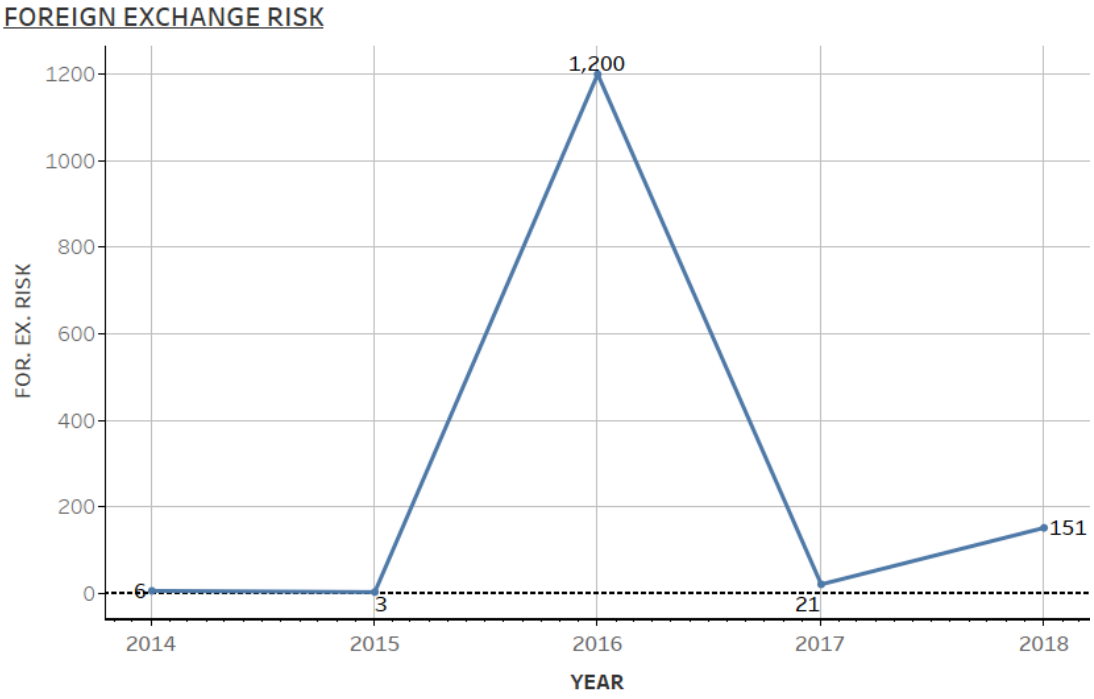


Figure 4.3: Trend in Foreign Exchange risk

Source: Study data (2020)

Figure 4.3 indicates that foreign exchange risk showed a mixed trend within the period under study. Foreign exchange risk was measured using the net foreign position. Its trend showed

a constant between 2014 and 2015, then a sharp upward trend in 2016. 2017 showed a declining trend and then an upward trend in 2018. These disparities indicated that MFIs are affected by foreign exchange risk differently depending on fluctuations of the exchange rate within the period. The total foreign assets increased during the period from Kshs. 21 million to Kshs. 524 million in 2018. There were no foreign liabilities within the period and therefore the trend showed that the MFI had gained from the foreign investment.

According to CBK (2019), Kenya's economy managed to remain stable during the period of the study due to stringent measures that were put in place by the Central Bank of Kenya on their fiscal and monetary policies. Kenya's economy expanded by 6.5% in 2018 compared to 4.9% in 2017. The stability caused the Kenyan currency to be strong compared to other foreign currencies and this is attributed to the improved net foreign position within the period. Most of the MFIs in the study were not affected by the foreign exchange risk as Faisal (2010) noted that most MFIs operate in developing countries where financial markets are underdeveloped, and they offer cheap loans to the unfortunate members of the communities.

Most of the MFIs utilize local capital markets especially the local commercial banks to borrow funds and then give loans to their customers at a higher interest. Mbabazize, Twesige, and Ekise (2014) observed that the management of different firms should take the role of foreign exchange risk management seriously. In cases where there is moderate or no applicability of better foreign exchange risk management, it may cause an organization to be affected by foreign exchange losses and lead to poor financial performance.

4.2.4 Trend in Inflation Rate Risk

The figure below shows the trend in inflation rate risk within the period under the study.

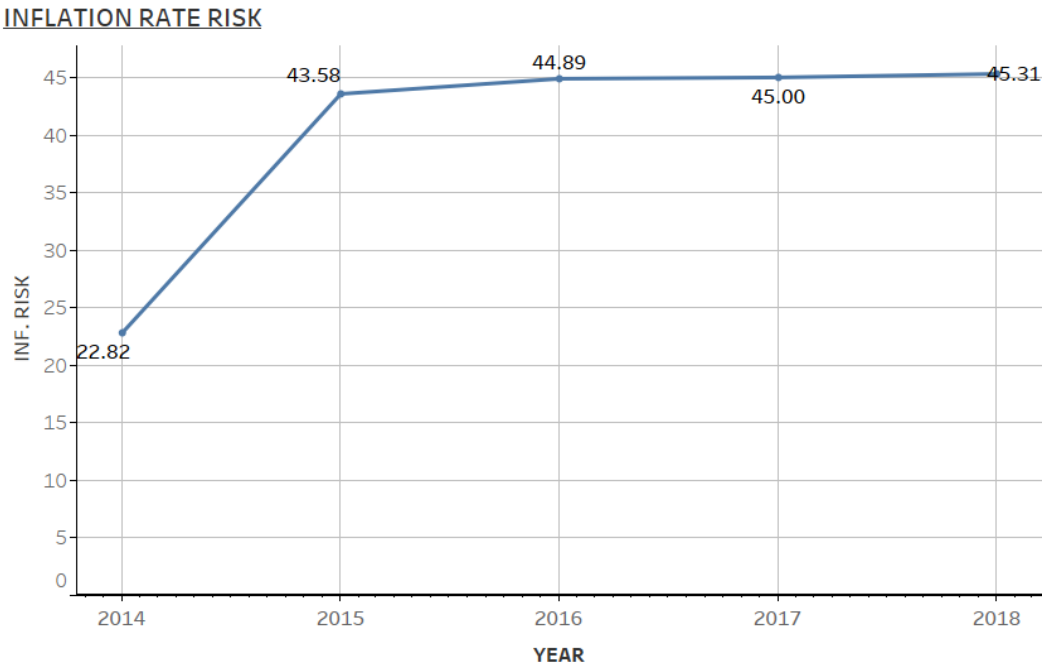


Figure 4.4: Trend in Inflation rate risk

Source: Study data (2020)

Figure 4.4 indicates the trend of inflation rate risk within the period. Inflation rate risk was measured using the inflation risk premium. An inflation risk premium is a ratio between the nominal and real interest rates. The inflation rate risk showed an upward trend between 2014 to 2015 and then it normalized in the rest of the period with just a slight upward trend. These indicated that between 2015 to 2018, the inflation risk stabilized. This could be attributable to the CBK enacting various reforms concerning the interest rate that stabilized the real interest rate within the period. The introduction of the KBR interest rate in 2014 and the interest capping rate in 2016 stabilized that effective interest rate within the economy. The inflation rate stabilized from 7.15 % in 2013 to 4.7% in 2018 (Central Bank of Kenya, 2019).

Haroon (2015) noted that the inflation rate risk affects financial developments in a country. He argued that inflation risk is influenced by money supply and total level of deposits and is not affected by the bank credit to the private sector. Inflation risk in the economy

influences a firm's financial performance negatively and reduces the effectiveness of the financial sector in both long and short time. Anafo, Bright and Luu (2016) noted that inflation risk has an inverse relationship between the issuance of loans and mobilization of funds by MFIs. Many businesses in developing countries are collapsing due to the effect of high inflation. Inflation influences the living standard of people and thus affects the mobilization of their funds and repayment of loans issued to them by their MFIs.

4.2.5 Trend in Financial Leverage

The figure below shows the trend in financial leverage risk within the period under study.

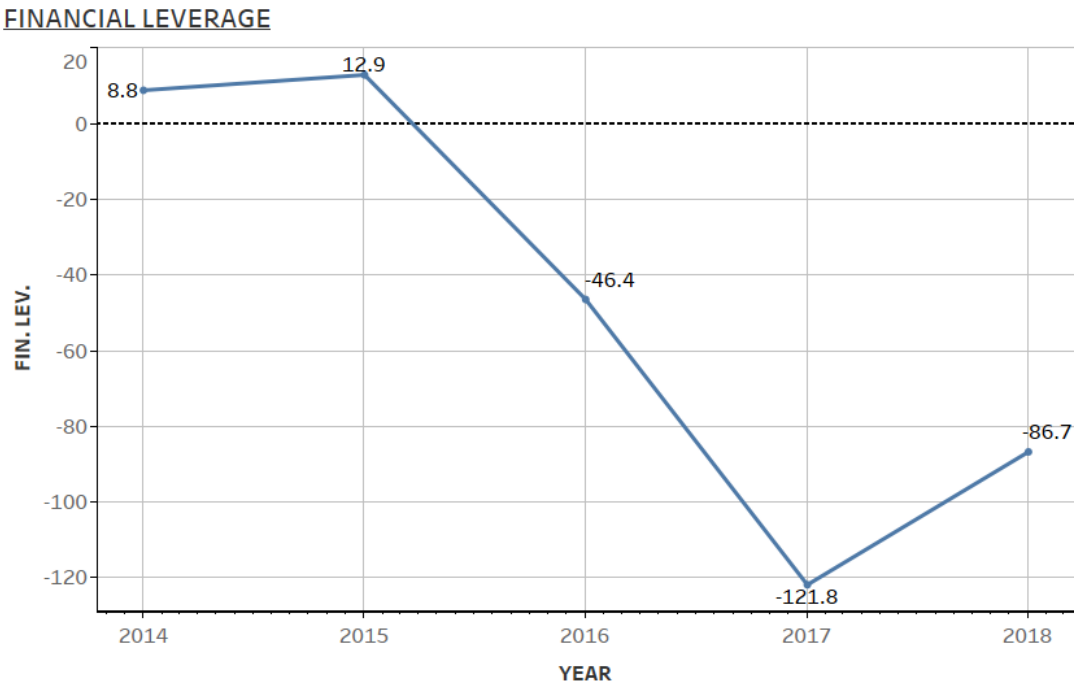


Figure 4.5: Trend in Financial leverage risk

Source: Study data (2020)

Figure 4.5 indicates the trend in financial leverage risk. Financial leverage risk was measured using the interest cover rate which is a ratio of EBIT over the interest paid. The ratio explains how the organizations have managed to generate enough income to cover the financial charges paid for the borrowings. The trend showed an increase in financial leverage

in the first two years, 2014 and 2015. Between 2015 to 2017, the financial leverage indicated a sharp decline. Between 2017 to 2018, there was a slight upward trend in financial leverage. The MFIs generated EBIT of Kshs. 1.960 billion, Kshs. 1.263 billion and Kshs. 114 million for years 2014, 2016 and 2018 respectively against a payment of fees and commissions totaling to Kshs. 1.78 billion, Kshs. 1.689 billion and Kshs. 1.5 billion same years. This indicated that the MFIs did not generate enough to cover the fees and interest paid to customers and to their financiers.

According to (Babu and Oyaro (2018), the enactment of the interest capping rate affected the MFIs indirectly. The commercial bank loans became cheaper to customers than ones offered by the MFIs. Instead of facilitating the individual customers to acquire the cheap loans from them, the commercial banks blocked them referring to them as more risky and preferred offering loans to corporate bodies like MFIs. Therefore, the MFIs ended up acquiring huge loans from commercial banks within the period in anticipation that they would offer them to their customers with a higher interest rate. The MFIs ended up paying high debt and interest to the bank which did not match with the income they received from their customers causing the negative effect.

Badawi (2017) observed that MFIs management must be conscious when they are dealing with the net interest margin. The managers should ensure that they seek cheaper credit facilities and invest in a high interest earning portfolio. They should also seek for more customers to offer their products and services. A mismatch between the two conditions will affect the organization's financial performance.

4.2.6 Trend in Firm Size

The figure below indicates the trend in MFI size within the period under the study.

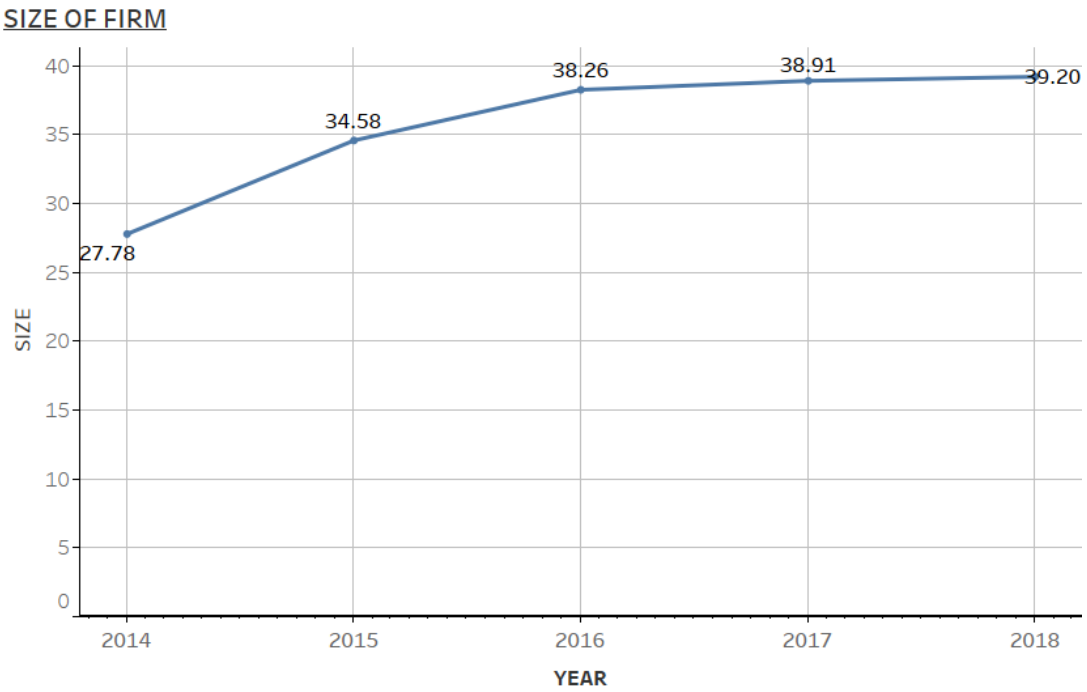


Figure 4.6: Trends in MFIs size

Source: Study data (2020)

Figure 4.6 indicates the trend of MFI size with the period. The figure shows that the MFIs increased in size within the period. MFI size was measured using the logarithm of total assets held. The positive trend showed that MFIs indicated steady growth in the asset base within the period. According to the Central Bank of Kenya (2019), the MFIs increased in size with an asset base of 56 billion in 2014 compared to an asset base of 70.7 billion in 2018 (27 %) and their customers' deposits increased from 9 billion in 2011 to 41.0 billion in 2018 (350%).

The increases in customers' deposits are attributable to the mobilization of deposits through agency banking and mobile banking. Kurnia (2013) observed that emerging trends in the microfinance sector are the innovations of financial inclusions. These innovations include agency banking and mobile banking which play an integral role in shaping the future of microfinance institutions. The innovations enable the MFIs to be more competitive in the financial market and be able to offer instant or faster services to their customers.

King'ori *et al*. (2017) observed that firm size is a major determinant of the financial performance of Kenyan MFIs. Firm size had a significant influence on financial performance. Larger MFIs showed a high degree of operational efficiency which leads to better financial performance. Maina, Kiragu and Riro's (2019) study also noted that there exists a positive and significant relationship between firm size and the profitability of financial institutions in Kenya.

Qamar *et al*. (2016) noted that a firm's size influences the relationship between firms' leverage and financial performance. Large firms can access the debt market more easily than small firms and thus they will have improved profitability. The large firms can generate high and less volatile returns and they document high liquidity compared to small firms. Therefore, small firms are riskier due to low liquidity and volatile profits.

4.3 Diagnostic Test Results

Diagnostic tests were carried out before inferential analysis to ensure that the assumptions of CLRM were not violated and the appropriate model was chosen for analysis if CLRM assumptions were not compromised (Chatterjee & Hadi, 2012). The relevant diagnostic tests for this study were carried out for multicollinearity, Hausman specification test, unit root/ stationarity test, normality, heteroscedasticity, as well as a test for serial correlation. The results of the specific diagnostic tests are presented below.

4.3.1 Test for Multicollinearity

The test for multicollinearity was carried out using the Variance Inflation Factor (VIF) whose results are summarized in Table 4.2 below. Correlation is considered to exist if the VIF is greater than 10 as recommended by Pawlicz and Napierala (2017).

Table 4.2: Test for multicollinearity

Variable	VIF	1/VIF	Remarks
Interest Rate Risk	1.36	0.732888	No Multicollinearity
Financial Leverage	1.23	0.811672	No Multicollinearity
Inflation Rate Risk	1.23	0.814672	No Multicollinearity
Foreign Ex. Risk	1.13	0.887953	No Multicollinearity
Mean VIF	**1.29**		

Source: Study data (2020)

In Table 4.2, results indicate that interest rate risk has a VIF of 1.36 which is less than 10. Financial leverage risk indicated a VIF of 1.23 which is less than 10. Inflation rate risk indicated a VIF of 1.23 which is less than 10. Foreign exchange risk also indicated a VIF of 1.13 which is less than 10. According to Pawlicz and Napierala (2017), a VIF of more than 10 indicates the presence of multicollinearity. This implies that there was no multicollinearity problem in all the variables and therefore all predictor variables were maintained in the regression model.

4.3.2 Panel Unit Root Test

The panel unit root test is applied for all variables and used to test the null hypothesis that all panels contain unit roots (i.e. series is non-stationary) against the alternative hypothesis that at least one panel is stationary. The study adopted Fisher-type unit root test based on the Augmented Dickey-Fuller (ADF) approach (Mansour *et al.*, 2014)

Table 4.3: Panel unit root test

Indicator	P statistic	Z statistic	L* statistic	PM statistic
Return on Equity	74.6541	-3.1785	-4.9417	6.7471
	(0.0000)	(0.0007)	(0.0000)	(0.0000)
Interest Rate Risk	126.2050	-4.6380	-8.5423	13.8959
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Foreign Ex. Risk	0.0000	-	-	-3.6056
	(1.0000)	-	-	(0.9998)
Inflation Rate Risk	48.0717	-1.6115	-2.0273	3.0608
	(0.0053)	(0.0535)	(0.0232)	(0.0011)
Financial Leverage	42.2146	-1.9653	-2.2031	2.2486
	(0.0233)	(0.0247)	(0.0156)	(0.0123)
Firm Size	16.9634	-1.2031	-1.2307	-1.2531
	(0.9102)	(0.1145)	(0.1142)	(0.8949)

Note: The P-values for the respective statistics are in brackets, P statistic refers to Inverse Chi-squared statistic, Z statistic refers to the Inverse normal, L* statistic refers to the Inverse logit, and PM statistic refers to the Modified inv. Chi-squared.

Source: Study data (2020)

In Table 4.3, the Fisher-type tests including inverse chi-squared, inverse normal, inverse logit, and modified inverse chi-squared reported P-values of all the variables. ROE indicated P-value of 0.000 < 0.05. Interest rate risk indicated a P-value of 0.000 < 0.05, inflation rate risk indicated P-values of (0.0053, 0.0232, 0.0011) < 0.05, financial leverage indicated P-values of (0.0233, 0.0247, 0.0156, 0.0123) < 0.05. Foreign exchange risk however indicated a P-value of 1.0 > 0.05. This implies that since the P-values are less than 0.05 except one, these results lead to rejection of the null hypothesis that all panels have unit roots as recommended by (Choi (2001).

4.3.3 Hausman test

When performing panel data analysis, one has to determine whether to run a random-effects model or a fixed-effects model (Baltagi, 2011). To decide on the most suitable model to use, coefficients are estimated by both random and fixed effects. The Hausman's specification test (1978) was used to choose between fixed and random effect models as presented in Table 4.4.

Table 4.4: Hausman test

	---- Coefficients ----			
	(b)	(B)	(b-B)	Sqrt_(diag_(V_b-V_B))
	B	B	Difference	S.E.
Interest Rate Risk	.0300009	.030232	-.0002311	.
Foreign Ex. Risk	-.9461665	-1.029925	.083759	.0515637
Inflation Rate Risk	-.0255334	-.039248	.0137145	.0079123
Financial Leverage	.7019966	.6984652	.0035314	.
Firm Size	.712968	.7916571	-.0786891	.0548157

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.91
Prob>chi2 = 0.9698
(V_b-V_B is not positive definite)
Source: Study data (2020)

The null hypothesis of the Hausman test was that the random-effects model was preferred to the fixed-effects model. For the ROE model, the Hausman test reported a chi-square of 0.91 with a P-value of 0.9698 implying that at the 5 percent level, the chi-square value

obtained was statistically insignificant. The researcher, therefore, failed to reject the null hypothesis that the random-effects model was preferred to the fixed-effect model as recommended by Greene (2008). Hence the appropriate model used in the study was the random-effects model.

4.3.4 Test for Normality

To test for normality, the study employed two approaches namely the Z-score test and the Kernel density estimates. For a population of fewer than 50 items, a Z-score for skewness and kurtosis larger than 1.96 will result to reject the null hypothesis and conclude the distribution is not normal. When there is non-normality of the data, logarithmic transformation will be used. In this, it reduces the variability of data in a data set where outliers exist. The log transformation usually transforms the skewed data to approximately conform to normality (Changyong *et al.,* 2014). The results are presented in the Tables below:

Table 4.5: Test for normality

Variable	Max Z Score	Skewness	Kurtosis
Return on Equity	1.5260312	-0.0485428	1.779354
Interest Rate Risk	1.5414517	-0.000807	1.775362
Foreign Ex. Risk	7.8747286	7.697004	61.03275
Inflation Rate Risk	1.8089428	0.1650327	1.932669
Financial Leverage	1.5957503	0.0804084	1.784733
Firm Size	1.6199368	-0.226052	3.14289
Median	**1.6078436**	**0.0398007**	**1.858701**

Source: Study data (2020)

In Table 4.5, the results indicated that ROE had a Z- score of 1.52, skewness of -0.0485, and kurtosis of 1.779. Interest rate risk had a Z-score of 1.541, skewness of -0.0008, and kurtosis of 1.775. Inflation rate risk had a Z-score of 1.808, a skewness of 0.165, and kurtosis of

1.7847. Financial leverage had a Z- score of 1.595, skewness of 0.0804, and kurtosis of 1.784. Foreign exchange risk indicated a Z-score of 7.874, skewness of 7.697, and kurtosis of 61.03.

According to Changyong *et al.* (2014), the decision rule is that if absolute Z-scores for either skewness or kurtosis is larger than 1.96, which corresponds with an alpha level of 0.05, then reject the null hypothesis and conclude that the distribution of the sample is not normal. All the variables: Return on Equity, interest rate risk, inflation rate risk and financial leverage followed a normal distribution except for foreign exchange risk whose Z-score was larger than 1.96. This implies that the variables are showing normality except the foreign exchange risk. The log transformation was applied on foreign risk variable to solve the non-normality problem.

To verify the above results, the study also conducted Kernel density estimates plots for individual variables. These plots produce a smooth curve estimating the probability density function of a continuous variable (Howell, 2013). They offer a convenient way to visualize the extent to which the distribution of a variable differs from a normal distribution

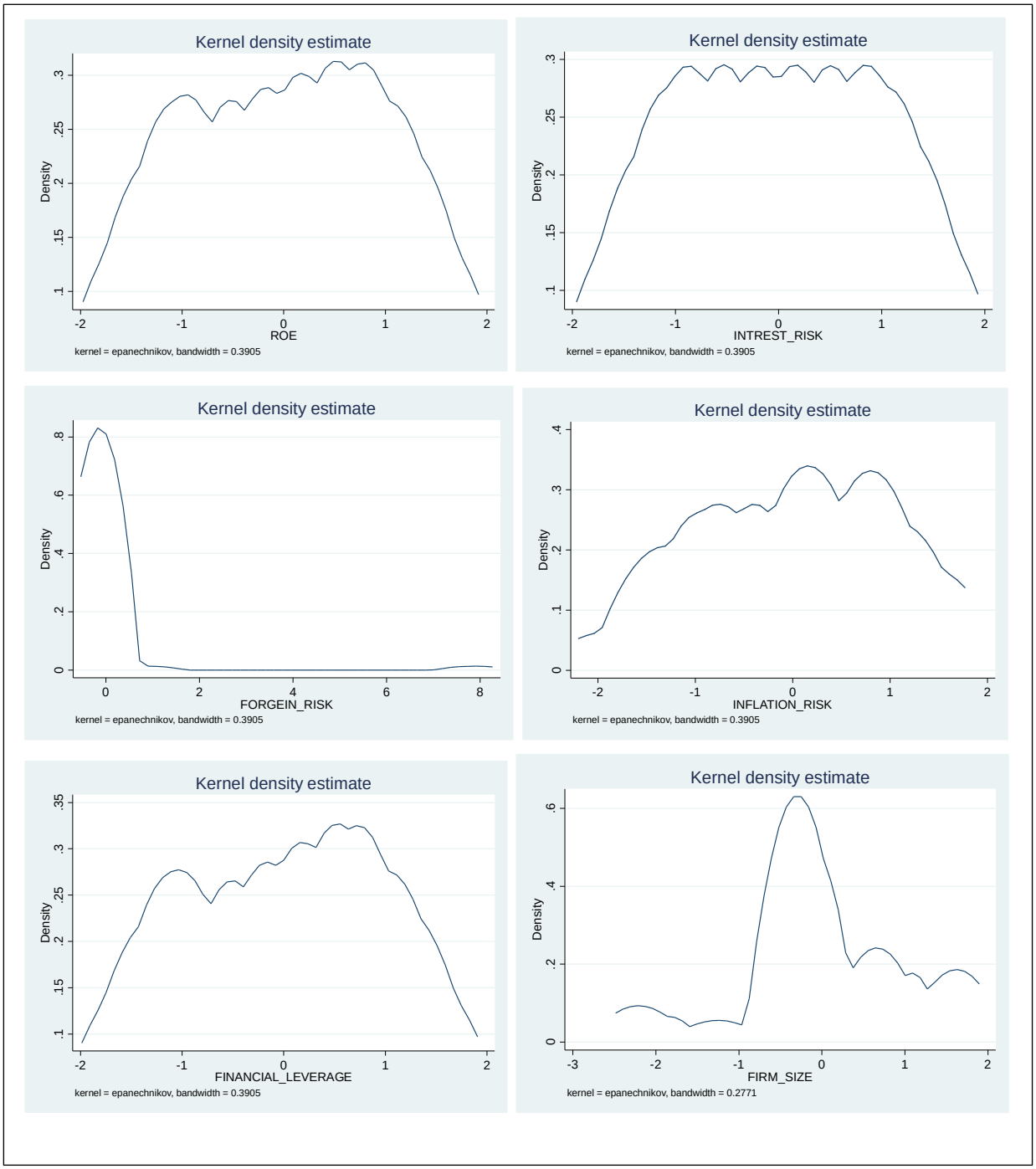


Figure 4.7: Kernel Density Estimates

According to Brooks (2008), a normal distribution is symmetric about its mean, while a skewed distribution will not be, but will have one tail longer than the other tail. The kernel density plots presented in Figure 4.7 make it clear that the distributions for Return on Equity, Interest Rate Risk, Inflation Rate Risk, Financial Leverage, and Firm size variables

approximately follow a normal curve. Foreign exchange risk variable distribution is distinctively skewed to the left hence not normally distributed. However, this problem was solved by normalizing the data and eliminating extreme outliers.

4.3.5 Test for Heteroscedasticity

An important assumption of the classical linear regression model (CLRM) is that the error term is homoscedastic that is the residuals have a constant variance. If the error variance is not constant, then there is heteroscedasticity in the data. The Breusch-Pagan test (1979) was used to test for heteroscedasticity where null hypotheses assume that the error terms variance is constant.

Table 4.6: Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity		
H0: Constant variance		
Variables: Intr_Rate Forg_Ex Inf_Rate Fin_Leverage Firm_Size		
Chi2(5)	=	7.55
Prob > chi2	=	0.1827

Source: Study data (2020)

In Table 4.6, the results indicated a P-value of 0.1827. This implies that since the reported P-value 0.1827 was larger than the critical level of significance at 0.05, the decision is not to reject the null hypothesis given that the reported p-value 0.1827 was larger than the critical level of significance at 0.05. These findings indicate the absence of heteroscedasticity in the study data as recommended by Poi and Wiggins (Mansour *et al.*, 2014).

4.3.6 Test for Autocorrelation

The study has employed the Wooldridge test (2002) for autocorrelation to detect the existence of autocorrelation in the data that is whether or not the residuals are serially correlated over time. The results are shown in Table 4.7.

Table 4.7: Test for autocorrelation

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F (1, 12) = 1.117
Prob > F = 0.3114

Source: Study data (2020)

In Table 4.7, the results indicated a P-value of 0.3114. The null hypothesis of this test was that there is no first-order serial/autocorrelation existing in the data. From the results, the test statistic reported an F-test with a value of 1.117 and a P-value of 0.3114 indicating that the F-test is not statistically significant at the 5 percent level. The test statistic reported is F-test with one and twelve degrees of freedom and a value of 1.117. The P-value of the F-test is 0.3114 indicating that the F-test is not statistically significant at the 5 percent level. Hence this implies that the null hypothesis of no autocorrelation is supported and the study concludes that residuals are not autocorrelated (Brooks, 2008).

4.4. Hypotheses Testing

This section presents the results of the hypotheses test. The study estimated equation 3.2 in generalized least square (GLS) regression. The estimation results for equations 3.1 and 3.2 are presented in Table 4.8 and Table 4.10.

The following null hypotheses were tested:

H_{01}: Interest rate risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{02}: Foreign exchange risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{03}: Inflation risk has no significant effect on the financial performance of microfinance institutions in Kenya.

H_{04}: Financial leverage has no significant effect on the financial performance of microfinance institutions in Kenya.

This section tests the four hypotheses with respect to the financial performance of microfinance institutions in Kenya. The estimation of the respective models is reported in Table 4.8.

Table 4.8: Market Risks and Financial Leverage on Financial Performance

ROE	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Interest Rate Risk	.0333939	.0083316	4.01	0.000	.0170642	0.049724
Foreign Ex. Risk	-.3284511	.1495648	-2.20	0.028	-.6215927	-0.03531
Inflation Rate Risk	-.0431592	.0569762	-0.76	0.449	-.1548306	0.068512
Financial Leverage	.6495247	.0643961	10.09	0.000	.5233108	0.775739
_cons	-.9735594	.2517968	-3.87	0.000	-1.467072	-0.48005
Number of obs	=	185				
R-sq: overall	=	0.8333				
Wald chi2(5)	=	215.34				
Prob > chi2	=	0.0000				

Source: Study data (2020)

The results in Table 4.8 indicate a chi-squared value generated by the Wald test, as well as the P-value associated with a chi-squared of 215.34 with four degrees of freedom. The P-value is 0.000 which is less than the generally used criterion of 0.05, therefore, we reject the null hypothesis, indicating that the coefficients are not simultaneously equal to zero. Including statistically significant predictors should lead to better prediction (i.e., better model fit), we can conclude that including the four predictor variables will result in a statistically significant improvement in the fit of the model.

4.4.1 Effect of Interest rate risk to the financial performance of Microfinance institutions in Kenya

The following Null Hypothesis was tested:

H_{01}: Interest Rate risk has no significant effect on the financial performance of Microfinance institutions in Kenya.

Interest rate risk had a coefficient of $\beta = 0.0334$ and P- value = $0.00 < 0.05$. Therefore, since the P-value < 0.05, we reject the null hypothesis and thus interest rate risk has a significant effect on the financial performance of microfinance institutions in Kenya. The coefficient of positive 3.3% indicates that interest rate risk has a positive effect on the financial performance of MFIs. Therefore, interest rate risk has a significant positive effect on financial performance of microfinance institutions in Kenya. The interest rate risk was measured using the Cumulative Interest Gap which is a ratio between risk-sensitive assets less risk-sensitive liabilities over the total assets.

A lot of competition in the financial sector caused by the changes in financial laws introduced by the CBK was experienced in the period between 2013 to 2018. In 2014, the CBK introduced laws on effective lending rates by commercial banks. They introduced the Kenya Banks Reform Rate (KBRR) where banks were supposed to base their effective lending rate on their customers with an additional premium. In 2016, the government introduced the interest rate cap laws, where the CBK controlled the interest rate charged by the commercial banks (Central Bank of Kenya, 2018).

Although the above two laws did not apply to MFIs, it had an indirect effect on them. The laws caused a lot of disruptions in financial investments. The MFIs benefited from accessing cheaper funds from the commercial banks where they were paying the loan with lower interests. On the other hand, the MFIs were offering loans to their customers with a slightly higher interest rate, and this improved their financial performance. The effects of the interest rate risk also resulted from the disruption of the fixed interest earnings from an investment in fixed deposits since the interest capping law applied to them too. MFIs held more risk-sensitive assets in their books than liabilities which indicated better financial performance.

In emerging markets like Kenya, the financial sector is affected by the interest rate risk, and mostly the repricing risk. The repricing risk arises from the timing difference in the maturity of fixed-rate and floating of assets, liabilities and off-balance positions. The repricing mismatch exposes the MFI's income to fluctuations where they can gain or lose depending on the interest rate variances (Ngalawa & Ngare, 2014).

In the competitive market set up, many firms compete for a limited market share. Competition helps a client to choose where to acquire credit with lower interest rates. Increased market power in the loan market may result in higher MFI risk due to increased interest charged to the clients and make loan repayment harder. Increased competition among financial service providers may determine loan portfolio quality and affect MFIs' financial performance (Ashim & Ranjula, 2013). The study concurs with the results obtained by Ndegwa *et al*. (2016) which indicated that although interest rate risk fluctuations affect the liquidity and profitability of MFIs, it has a positive significant influence on financial performances.

Badawi (2017) contends with the above study and argued that the Net Interest Margin which is a measure of interest rate risk indicates how firms have placed their assets in the form of credits. The more credits held usually earn MFIs interest income and lead to more profits. The study concurs with the International Fisher Effects Theory whereby if one firm charges higher interest, the borrowers will shift to lower interest rate lending institutions and thus affect the firm's financial performance. Ngalawa and Ngare (2014) noted that exposure to interest rate risk is common in the financial sector. The study found that any changes from fluctuations of the market interest rate risk causes a positive influence on a change in incomes generated from the sensitive assets.

Olweny *et al.* (2017) observed that interest rate risk has a positive significant effect on the financial performance of financial institutions. The institutions increase their profits when interest rate risk increases thus, most of the time, the interest rate variability favours their financial performances. Odeke and Odongo (2014) concurred with the study results that interest rate risk exposure has a positive significant influence on the financial performances of banks.

The result contradicts Kolapo and Fapetu's (2015) study which noted that interest rate risk does not have any significant influence on the financial performance of Deposit Taking firms. However, it agrees with Murage *et al*. (2018) who found that interest rate risk has an insignificant influence on the financial performance of MFIs and Mbuvi and Wamiori (2017) who observed that high-interest rate risk weakens the financial performance of the MFIs.

4.4.2 Effect of Foreign Exchange risk on the financial performance of microfinance Institutions in Kenya:

The following Null Hypothesis was tested:

H_{02}: Foreign exchange risk has no significant effect on the financial performance of microfinance institutions in Kenya.

Foreign exchange risk had a coefficient of $\beta = (0.328)$ and P- value = $0.028 < 0.05$. The P-value is less than 0.05, therefore, the null hypothesis is rejected. Thus, foreign exchange risk has a significant effect on the financial performance of microfinance institutions in Kenya. A coefficient of negative 32.8% indicates that foreign exchange risk has a negative effect on financial performance. Therefore, foreign exchange risk has a significant negative effect on the financial performance of microfinance institutions in Kenya. Foreign

exchange risk was measured using foreign exchange exposure. Foreign liabilities are subtracted from foreign assets to shareholder's fund which shows the degree to which the MFI is being affected by the foreign exchange risk.

Most MFIs operate in developing countries where financial markets are underdeveloped, and they offer cheap loans to fewer fortunate members of communities. Most of them utilize local capital markets especially the local commercial banks to borrow funds and then give loans to their customers at a higher interest (Faisal, 2010).

In Kenya, only the large MFIs have engaged with access to international financial markets. The financial sector has adopted a free-market approach of letting the MFIs and International Microfinance Fund work on ways of hedging foreign exchange risk. The international market offers long-term loans which are usually cheap although due to the foreign exchange rate that fluctuates most of the time, they may end up being extremely expensive. The findings indicate that the MFIs were affected negatively by highly interest payments to the international loan market. The coefficient results of negative 32.8 % indicate that firms must manage to hedge the foreign exchange risk to achieve better financial performance.

Jamal *et al.* (2014) noted that foreign exchange risk causes a firm’s exposure to unanticipated changes between countries and causes severe financial consequences. Moh'd and Karim (2017) observed that MFIs should aim to get access to funds and invest where countries' currency is favourable and flexible, with the pegged exchange rate to reduce foreign currency risk for them to get better returns and financial position. Their results also concurred with the Expectation Theory of Exchange which postulates that foreign currency risk influences financial performance. The theory indicates that if the local financial market

offers funds with higher interest rates, then the MFI can seek the cheaper international market for cheaper loans. If they want to do an investment, they will search for higher returns by investing in the international market.

Pradita and Geraldina (2019) noted that foreign exchange risk has a significant negative influence on the financial performances of a financial institution when measured using transaction risk. Omondi and Makori (2019) concurred with the study that foreign exchange risk has a significant negative effect on the financial performance of banks in Kenya. They noted that firms can be able to improve their financial performance through efficient and effective management of exchange rate risk which poses a greater effect on the firm's performance.

Some studies which include Gietzen (2017) observed that foreign exchange risk has zero effect on financial performance. Kamau *et al*. (2015) noted that foreign exchange risk has an insignificant effect on financial performance. Parlak and İlhan (2015) observed that firms with a long term foreign exchange position showed high financial performance. Mbabazize *et al*. (2014) found that foreign exchange management also plays a major role in mitigating the effect of foreign currency risk. Good foreign currency management results in better financial performance.

4.4.3 Effect of Inflation Rate risk on the financial performance of microfinance institutions in Kenya

The following Null Hypothesis was tested:

H_{03}: Inflation risk has no significant effect on the financial performance of microfinance institutions in Kenya

Inflation risk had a coefficient of $\beta = (0.431)$ and P-value = 0.49 > 0.05. Since the P-value is more than 0.05, we do not reject Ho that Inflation rate risk has no significant effect on the financial performance of microfinance institutions in Kenya. The results show that inflation rate risk has no significant effect on the financial performance of MFIs in Kenya. Inflation rate risk was measured using the inflation premium which compares the nominal rate charged by the MFIs to borrowers with a real rate of interest.

During the period of the study, the CBK had instituted laws that had controlled the interest rate risk and in the process controlled the inflation risk. Kenya's economy expanded by 6.3 % in 2018 compared to 4.9% in 2017. The inflation rate (measured by food and fuel prices) stabilized from 7.15 % in 2013 to 4.7% in 2018. This was caused by the stability and resilience of the financial sector, which was geared for the benefit of deposit, creditors and overall strength of Kenya's economy. The CBK had put strict supervision and regulations in controlling the financial sector and had applied prudent monetary policy (Central Bank of Kenya, 2019).

Inflation risk is a macroeconomic condition that affects the whole economy. The inflation rate causes an increase in prices of goods and commodities, and this reduces the citizen's purchasing power. The risk affects purchasing power, financial sector exchange regimes, worsens financial institution's loan policies, and disrupts business plans and equity holding performance. Inflation risk harms the whole financial sector and spills over to the whole economy (Umar *et al.,* 2014).

The study concurs with Ifeanyi and Chukwuma's (2016) study that found that inflation has a negative influence on the firms' value but they have insignificant influences on the firm's profitability and financial performances. Caro (2017) noted that macroeconomic conditions

which include the inflation risks have an insignificant influence on financial performance. The study noted that MFIs' financial performance is affected most by internal factors within the organization and not the macro-economic factors.

Anafo *et al*. (2016) observed that inflation risk has an inversing relationship between the issuance of loans and mobilization of funds by MFIs. The time of high inflation will affect the mobilization of customer's deposits of the MFIs which affects their financial performance. The borrowers also will not have the ability to borrow loans as required since the MFIs will issue high-interest loans.

The study contradicts other studies like Haroon (2015) which indicated that inflation risk has a negative and significant influence on financial performances. Vanroose and D'Espallier (2009) observed that high inflation leads to low firms' profitability which is caused by the overall prices of goods and services and a reduction of customers saving power. In their study, Pacini, *et al*. (2017) found that inflation risk has a positive and significant effect on financial performance. The study noted that inflation risk caused the production of goods to increase to a lower degree than the increased prices resulting in high profits.

4.4.4 Effect of Financial Leverage on the financial performance of microfinance institutions in Kenya

The following Null Hypothesis was tested:

H_{04}: Financial leverage has no significant effect on the financial performance of microfinance institutions in Kenya.

Financial leverage had a coefficient of $\beta = 0.650$ and P- value = $0.000 < 0.05$. The P-value of 0.000 is less than 0.05 hence the null hypothesis is rejected. Therefore, financial leverage has a significant effect on the financial performance of microfinance institutions in Kenya. The coefficient of positive 64.95% indicated that financial leverage risk has a positive effect on the financial performances of microfinance institutions in Kenya. Therefore, financial leverage has a significant positive effect on the financial performance of microfinance institutions in Kenya.

The study revealed that an improvement in debt finance will lead to improved financial performance. All MFIs under study have utilized debt financing as their major source of funds compared to shareholders' funds. The study was done during the period of interest cap laws to the commercial bank by the CBK and hence most of the commercial banks preferred to offer loans to less risky corporate firms like the MFIs than individual clients. The MFIs are later able to offer loans to their borrowers on their preferred effective interest rates.

According to Capital structure theory, debt financing is cheaper than equity financing in long run. Firms should utilize debt funds to generate enough income to repay the debt interest and to increase their profits. Firms also enjoy tax benefits from the government for the use of debt finance which increases their financial performances. Nimalathasan and Pratheepkanth (2012) found a direct relationship between financial leverage and profitability. The study found that a highly geared firm which has an improved financial leverage has a positive influence on the profitability and the overall financial performance.

Vijitha (2016) observed that MFIs managers must make important decisions on how the firm is to be financed whether to use low debt or preferred stock based on expected returns

of equity. Beyond a certain optimal level, the cost of leverage tends to outweigh the benefits accrued from financing using debts. An optimal geared level leads to a significant positive influence on financial performance. The study also concurs with MPT theory which indicates that a firm with a high leverage portfolio attracts more investors since they perform better than low geared firms. Managers can assemble a portfolio with risky assets and high returns.

Hussan (2016) noted that financial leverage has a positive impact on sales revenue, earnings before interest, and tax and Earning per share of the firm. Financial Leverage is the long-term debt financing that improves the permanent finance and success of the organization. Debt financing increases the share price of a firm indicating a positive earning ability and wealth maximization. Firms that use financial leverage increase their investment capacity and enjoy tax exemption facilities and thus high financial performance.

The results contradict some studies like that of Abubakar (2015) who noted that there is a negative relationship between financial leverage and financial performance. About 84% of total assets of 11 deposit money banks under study were financed by debts thus highly leveraged. The study concluded that the optimal debt-equity ratio should be maintained by banks to improve financial performance and survival and to remain competitive. Mohammeda and Knapkovaa (2016) found that when financial leverage is used as a control variable in their study, the result indicated that financial leverage affects financial performance negatively which is a result of long-term debt commitment.

4.4.5 Analysis of Moderating Effect of Firm Size

To establish the statistical significance of the hypothesized relationships, multiple linear regression was conducted at a 95 percent confidence level (α=0.05). The hypothesis aimed

at establishing the moderating effect of firm size on the relationship between financial leverage, market risk and financial performance of MFIs in Kenya. To test this hypothesis, the model proposed by Baron and Kenny (1986), which is carried out in two steps, was used.

H_{05}: Firm size has no significant moderation effect on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya.

The Baron and Kenny (1986) model were used, and the two steps are as follows:

Step One: Firm size as an independent variable

This step involved firm size being introduced as an independent variable. The results are presented in Table 4.9 below:

Table 4.9: Firm Size as an Independent Variable

ROE	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Market risk	.0478458	.022187	2.16	0.031	.0043602	.0913314
Financial Leverage	.7256111	.0647767	11.20	0.000	.598651	.8525711
Firm Size	-.0367547	.1375814	-0.27	0.789	-.3064094	.2329
_cons	-.464963	.2246837	-2.07	0.039	-.9053348	-.0245911
Number of obs	=	185				
R-sq: within	=	0.4923				
Wald chi2(5)	=	213.59				
Prob > chi2	=	0.0000				

Source: Study data (2020)

The results in Table 4.9 indicate R squared of 49.23% implying that financial leverage, market risk and firm size had explanatory power on the financial performance of

microfinance institutions in Kenya. This indicates that a combination of these variables can adequately explain variation in financial performances. The P-value of 0.000 which is less than 0.005 indicates that financial leverage, market risk and firm size were jointly significant in explaining variation in the financial performance of microfinance institutions in Kenya.

The results indicated the coefficient of market risk ($\beta = 0.0478$, P- value = $0.031 < 0.05$) which shows a P- value less than 0.05. This indicates that market risk has a significant positive effect on the financial performance (Return on Equity) of MFIs in Kenya. The result indicates that market risk variables have a low explanatory power on financial performance accounting for 4.78%.

The results indicated the coefficient of financial leverage ($\beta = 0.7256$, P- value = $0.000 < 0.05$) which shows a P- value less than 0.05. This indicates that financial leverage has a significant positive effect on the financial performance (Return on Equity) of MFIs in Kenya. The result indicates that financial leverage variables have a high explanatory power on financial performance accounting for 72.56%.

The results indicated that the coefficient of firm size ($\beta = - 0.0368$, P-value = 0.789) which is greater than 0.05. This implies that there is no significant direct relationship between firm size and financial performance. This also implies that firm size does not directly affect financial performance and thus it is not a predictor variable to financial performance.

The findings contradict King'ori *et al*. (2017) who observed that firm size is a major determinant of the financial performance of Kenya's MFIs. The study noted that Firm size plays a significant influence on financial performance. Larger MFIs showed a high degree of operational efficiency which leads to better financial performance. The study used the

log of the asset as a performance indicator of firm size. Maina, Kiragu and Riro (2019) observed that there is a relationship between firm size and the financial performance of financial institutions. The study found that firm size has a positive influence on the firm's financial performance.

Olawale, Ilo and Lawal (2017) noted that firm size determines the overall financial performance of firms. When the firm improves on its sales turnover, it is an indicator of improvement in its financial performance. Koncova *et al.* (2016) observed that firm size influences the financial performance of firms. The study found that large firms reach high economic performance compared with small firms. This is attributable to large firms enjoying economies of scale. Babalola and Volodymyr (2013) observed that firm size has a positive influence on financial performance.

Step Two: Firm size as a moderator variable

In this step, the firm size was introduced as a moderator variable. The results are presented in Table 4.10.

Table 4.10: Firm Size as a Moderating Variable

ROE	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
arket risk	.0489296	.0225434	2.17	0.030	.0047454	.0931139
Financial Leverage	.6521389	.0690685	9.44	0.000	.516767	.7875107
Firm Size	-.2589317	.1474987	-2.35	0.019	-.5480237	.0301604
Market Risk * Firm Size	.0208582	.0093021	2.24	0.025	.0026263	.0390901

Financial Leverage * Firm Size	.122389	.1071509	1.14	0.253	-.0876229	.3324008
_cons	-.6339409	.2332808	-2.72	0.007	-1.091163	-.1767189

Number of obs	=	245
R-sq: within	=	0.5947
Wald chi2(5)	=	199.03
Prob > chi2	=	0.0000

Source: Study data (2020)

The results in Table 4.10 indicate that market risk had a coefficient of β = 0.0489 and P-value = 0.030. Since the P- value is less than 0.05, it shows that market risk has a significant effect on financial performance (Return on Equity) of MFIs in Kenya. The regression coefficient of positive 4.89% obtained in this case indicates that market risk has a positive effect on financial performance.

Financial leverage had a coefficient of β = 0.6521 and P-value = 0.000. Since the P- value is less than 0.05, it shows that financial leverage has a significant effect on financial performance (Return on Equity) of MFIs in Kenya. The regression coefficient of positive 65.21% obtained in this case indicates that financial leverage has a positive effect on financial performance.

Firm size had a coefficient of β = - .2589 and P-value = 0.019. Since the P-value is less than 0.05, firm size has a significant effect on the financial performance (Return on Equity) of MFIs in Kenya. The regression coefficient of negative 25.89% obtained in this case indicates that firm size has a negative effect on financial performance.

The interaction of market risk and firm size to the financial performance had a coefficient of $\beta = 0.\ 0209$ and $p = 0.025 < 0.05$. Since the P-value is less than 0.05, the interaction i.e. Market risk * Firm size has a significant effect on the financial performance (Return on Equity) of MFIs in Kenya. The regression coefficient of positive 2.09% obtained in this case indicates that the interaction of market risk and firm size has a positive effect on financial performance.

However, the interaction of financial leverage and firm size to the financial performance had a coefficient of $\beta = 0.\ 1224$ and $p = 0.253 > 0.05$. Since the P-value is greater than 0.05, the interaction i.e. Financial leverage * Firm size does not have a significant effect on the financial performance (Return on Equity) of MFIs in Kenya, therefore no moderation effect exists. The regression coefficient of positive 12.24% obtained in this case indicates that the interaction of financial leverage and firm size has a positive effect on financial performance.

The results further indicate an R squared of 0.5947. This implies that with the introduction of the firm size as a moderator variable to the relationship between market risk, financial leverage and financial performance, it improved on the explanatory power accounting for 59.47 percent of financial performance (Return on Equity) of MFIs in Kenya. The Chi-squared value was 199.03 with a P-value of 0.000, which is less than 0.05. This indicates that financial leverage, market risk and moderator variable firm size were jointly significant in explaining variations in financial performance.

The results indicate that the study rejected hypothesis H_{05} at a 5 percent significant level and concluded that firm size has a significant moderation effect on the relationship between financial leverage, market risk and financial performance of microfinance institutions in

Kenya. This is in line with Atif and Qaisar (2015) who studied the moderating effect of firm size on the relationship between firm growth and the firm's financial performance and found that firm size has moderating inspirations on the relationship between the two variables. The results also showed that firm size as a predictor variable also influences financial performance.

In a study on the effect of firm size on the financial performance of manufacturing firms in Nigeria, Babalola and Volodymyr (2013) noted that firm size is a major determinant of financial performance. The study conceptualized firm size as a predictor variable and found that it has a positive influence on financial performance whereas if it is treated as a control variable on the relationship between leverage and financial performance, the leverage has a negative influence on financial performance.

Onsongo *et al.* (2019) found that firm size has a moderating effect on the relationship between risk and performance. The study found that large firms with higher total assets than their counterparts in the same industry played a better role in the risk management of the company. For companies to record improved financial performance, they need to manage their risks well by implementing risk management initiatives and increasing their total asset base.

Kahihu *et al*. (2020) found that firm size has a moderating effect on the relationship between market risk and financial performance of microfinance institutions in Kenya. The study found that MFIs must identify their optimal size that will enhance their financial performance. Kipesha (2013) observed that there is an impact of a firm's size and age on the financial performance of MFIs. Different results obtained depended on the performance indicator used. When firm size is measured using total assets and the number of borrowers,

the results showed that firm size influences financial performance positively. On the other hand, when firm size is measured using the number of employees in the MFIs, it showed that it has a negative impact on efficiency, sustainability and profitability. Kenyan MFIs have shown that sizes also influence their financial performance.

Podobnik *et al.* (2009) found that firm size does not influence the interaction between market risk and financial performance in the long run. The study noted that both risk and return measured using the growth rate decreases with an increase in organization size. The average growth rate decreases faster than the risk with market capitalization which represents the size of the company. The organization must understand the optimal size in maintaining a balanced risk-return tradeoff for improved profitability. Ali *et al*. (2016) also found that firm size does not moderate the relationship between management participation and the financial performance of an organization.

Regarding MFIs in Kenya, the MFIs in large categories are more profitable than the medium and small categories. The large MFIs have an advantage of borrowing more and cheaper funds from financial institutions since they have a large asset base and are considered less risky than the small ones. The large MFIs can be able to offer more loans to customers with preferred interest rates depending on how they will be able to obtain loans with lower interests. Large MFIs will be able to benefit from the benefits of economies of scale in obtaining their resources and they can manage to minimize their operations expenses. The large firms can also be able to hire professional human resources in management and can be able to market their products with those funds.

4.5 Summary of Tests of Hypotheses

Table 4.11 presents a summary of the results of tests of hypotheses as discussed above.

Table 4.11. Summary of Hypotheses Testing.

Hypotheses		Results	Decision	Conclusion
H_{01}:	Interest Rate risk has no significant effect on the financial performance of microfinance institutions in Kenya.	P=0.000<0.05	Reject H_0	Interest rate risk had a significant positive effect on the financial performance of microfinance institutions in Kenya.
H_{02}:	Foreign Exchange risk has no significant effect on the financial performance of microfinance institutions in Kenya.	P=0.028<0.05	Reject H_0	Foreign Exchange risk had a significant negative effect on the financial performance of microfinance institutions in Kenya
H_{03}:	Inflation Risk has no significant effect on the financial performance of microfinance institutions in Kenya.	P=0.449>0.05	Failed to reject H_0	Inflation Risk had no significant effect on the financial performance of microfinance institutions in Kenya.
H_{04}:	Financial Leverage risk has a significant effect on the financial	P=0.000<0.05	Reject H_0	Financial Leverage risk had a significant positive effect on the financial performance of

	performance of microfinance institutions in Kenya.			microfinance institutions in Kenya.
H_{05}:	Firm size has no significant moderation effect on the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya.	P=0.025<0.05	Reject H_0	Firm size moderated the relationship between market risk and financial performance of microfinance institutions in Kenya.
		P=0.025<0.253	Failed to reject H_0	Firm size did not moderate the relationship between financial leverage and financial performance of microfinance institutions in Kenya.

Source: Study Data (2020)

4.6 Summary

The chapter dealt with the results from the study findings and interpretation. It analyzed data using descriptive analysis using mean and standard deviation together with trend of the variables. It also showed the results from the diagnostic tests and the Hypothesis testing.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusion, the contribution of the study to knowledge, and recommendations for further study. The purpose of this study was to investigate the effect of market risk and financial leverage on the financial performance of microfinance institutions in Kenya.

5.2 Summary

Earlier studies on market risk and financial leverage noted contradicting findings concerning their effects on the financial performance of microfinance institutions. Kenya Vision 2030 economic blueprint seeks to continue providing a high quality of life to its citizens by improved access and development of financial services and products to all. The blueprint envisaged to raise the GDP growth rate to at least 10% through vibrant and competitive financial services.

Despite the tremendous growth in numbers, asset base and customers, the MFIs have continuously reported a decline in their financial performances. Some of them have faced challenges in maintaining the statutory requirements on the minimum core capital and liquidity ratio. The study therefore sought to investigate the effect of market risk and financial leverage on the financial performance of microfinance institutions in Kenya.

The study was anchored on the Dynamic Capability, Resource-Based Value, Extreme Value, Expectation Theory of Exchange Rate, International Fisher Effects and Modern Portfolio financial theories. The study used positivism philosophy, explanatory non-experimental research design. Panel data was collected from two main sources: MFI annual

financial statements and bank supervision reports by CBK from 2014-2018. Descriptive statistics were used to describe and summarize data characteristics while inferential statistics, particularly panel multiple regressions were used to predict the effect of market risk and financial leverage on the financial performance of microfinance institutions in Kenya.

The study found that Interest rate risk has a significant positive effect on the financial performance of microfinance institutions in Kenya. The study revealed that MFIs sought funds mostly through the mobilization of deposits from clients and loans from financiers who charge interest and they then provide the same to their customers by charging higher interest. The expectation of the study was that there exists a relationship between interest rate risk and the financial performance of the microfinance institutions. The expectation was confirmed through statistical analyses which showed interest rate risk has a significant positive effect on financial performance.

Foreign exchange risk was found to have a significant negative effect on the financial performance of MFIs in Kenya. The study revealed that MFIs' incomes were affected by the fluctuations of foreign exchange among countries they transacted business with. The study found that most MFIs did not engage in foreign exchange transactions within the period. Expectation theory of exchange rate postulates that the effect of foreign exchange risk can be minimized by hedging the risk using available derivatives in the market. The statistical analyses that showed foreign exchange risk had a significant negative effect and confirmed the expectation of the study.

The study findings revealed that inflation rate risk does not influence the financial performance of microfinance institutions in Kenya. The study also found that during the

period of study, the inflation rates remained almost constant, and thus the findings indicated that inflation rate risk has no significant influence on the financial performance of microfinance institutions in Kenya which confirmed the study expectation.

The study investigated the relationship between financial leverage risk and financial performance. The findings indicated that financial leverage has a significant positive effect on the financial performance of microfinance institutions in Kenya. The study found that all the MFIs are highly geared and rely on loans mostly from commercial banks. This finding also relates to the Modern Portfolio Theory where the organization needs to identify the most profitable portfolio to purchase and on how they will fund the portfolio minimizing the financial leverage risk. The findings confirmed the study expectation that financial leverage has a relationship with financial performance.

The study further investigated whether firm size moderates the relationship between market risk and financial performance. The study also found that firm size does not moderate the relationship between financial leverage and financial performance. The results indicated that a firm's size moderates the relationship between market risk and financial performance of MFIs. The result concurs with the expected results from the study.

5.3 Conclusions

Review of previous studies done on the relationship between market risk, financial leverage and financial performance dealt with commercial banks and other industries in the financial sector. The effect of market risk and financial leverage on the financial performance of microfinance institutions was left out which is a unique industry in its operations and the government is keen in making various laws and reforms to regulate it. This study recognizes market risk factors and financial leverage that affect the financial performance of

microfinance institutions which the owners and the MFIs CEOs need to be aware of. Thus, the basis of the current study was conceptualized to investigate the effects of market risk and financial leverage on the financial performance of microfinance institutions in Kenya.

As per the study expectations, market risk and financial leverage variables indicated that they affect the financial performance of microfinance institutions although differently. Interest rate risk and financial leverage risk were found to have a significant positive effect on financial performance; foreign exchange risk indicated it has a significant negative effect while inflation risk has no significant effect on the financial performance. The study also found that firm size moderates the relationship between market risk and financial performance but it does not moderate the relationship between financial leverage and financial performance. This implies that market risk variables play a key role in influencing the financial performance of an organization.

The organization must put the necessary measures to identify and mitigate the interest rate risk, foreign exchange risk and financial leverage risk. The management should be more concerned about the financial leverage risk which was found to have more influence on the financial performance than market risk variables.

5.4 Contribution of the Study to Knowledge

This study investigated the relationship between market risk, financial leverage and financial performance of microfinance institutions in Kenya. Despite prior empirical studies establishing that market risk and financial leverage has a significant relationship with financial performance, it has been noted that the focus of these past studies had been on commercial banks. Besides, these studies had a couple of critical limitations relating to

methodology, context, consistency of results and conceptualization of research variables and models.

In the local context, empirical studies conducted revealed that aspects of market risk and financial leverage influence financial performance. Nevertheless, these studies considered aspects of risk encompassing risk assessment, risk identification, and risk management and practices. This study contributes to the empirical literature by revealing that market risk variables among them interest rate, and foreign exchange and financial leverage have a significant influence on the financial performance of microfinance institutions in Kenya.

The study found that inflation risk has an insignificant effect on the financial performance of microfinance institutions. These findings contribute to the existing financial knowledge as they reveal mixed results from previous studies which trigger further research.

Furthermore, the study adds to the existing body of empirical literature and contributes to the debate at the heart of financial management research on factors that influence financial performance. The study extends the conceptualization of the relationship between market risk, financial leverage and financial performance through the integration of a moderating variable (firm size). This integrated research model has fundamental implications for both practitioners and researchers in the financial sector and organizations. Moreover, the four critical variables that are utilized in this study comprising of interest rate risk, foreign exchange risk, inflation risk and financial leverage enhance the conceptualization of the independent variables framework. The conceptual framework was enriched to further create more awareness and understanding of the research scenario under study. It presented the study variables diagrammatically, linking their relationships.

Panel multiple regression includes bringing together many predictor variables into a single regression equation. Thus, the effect of multiple predictor variables on the dependent measure was assessed. The goal of analysis for using this model was to find the best fitting and most parsimonious reasonable model to describe the relationship between the dependent variable, financial performance and a set of independent variables that included market risk and financial leverage.

The study also contributes to theoretical literature by providing the basis upon which the theoretical propositions utilized in the formulation of the research hypotheses can be empirically tested. This study was anchored on various theories: Dynamic Capability, Resource-Based Value, Extreme Value, Expectation Theory of Exchange rate, International Fisher Effects and Modern Portfolio financial theories.

Extreme Value theory was utilized to explain how the organization measures the effects of extreme losses caused by the effects of inflation risk. The study supports the Expectation theory of exchange rate as it relates to how organizations are affected by the fluctuations of the foreign exchange risks between countries. The study relates to the International Fisher theory as it examined how MFIs are affected by the effects of interest rate risk. This study supports the Modern Portfolio theory as the management must identify the optimal financial leverage to maintain good financial performances.

5.5 Recommendations for Policy and Practice

To achieve the Kenya Vision 2030 blueprint on providing access to financial services to all citizens, the microfinance institutions need to be vibrant to contribute significantly to this national economic goal. The microfinance industry is supposed to assist in offering various financial products and services to citizens and small-scale businesses that do not have access to loans from commercial banks. The MFI industry has to play a key role in ensuring

that they will be able to reach as many citizens as possible so that they contribute significantly to the achievement of a targeted economic growth in GDP rate of 10 % per year.

However, the MFI industry seems to be faced with immense competition from many unregulated players in the financial sector receiving deposits from the customers and offering them loans. Strict regulation and requirements from the CBK disadvantages MFIs from competing effectively in the market. The rapid growth of MFIs did not match the poor financial performance reported over the years under study and this led to a need for further research to establish various factors affecting their financial performance.

Policymakers including the Central Bank, National Treasury, MFIs and other stakeholders should focus on reforms that promote better financial management and an equal playing field to various industries in the financial sector. The CBK has in the past instituted various laws including increased minimum core capital and liquidity rate which are punitive to MFIs, forcing them to seek expensive loans for them to survive in the market. The government should put in place proper monetary and fiscal policies in the country to curb the interest rate risk and foreign exchange risk. The shareholders should embrace an increase of capital funds through equity which is cheaper than loans from commercial banks.

The MFIs stakeholders must lobby together as a team through their associations like AMFI to the government to slow down some stringent measures like increased liquidity ratio retention and increased minimum core capital. The owners and CEOs of MFIs need to utilize the cheap funds from the mobilization of deposits from customers instead of seeking costly funds from commercial banks. The government should lessen the statutory

requirements policy on minimum core capital so as to allow the MFIs to have enough capital to offer to their customer as loans with low interest, and to expand their business with the implementation of new financial innovations like the mobile phone platforms.

The owners and CEOs of MFIs should put risk management measures such as risk identifications in place to prevent the MFIs from the market risk exposure. The study recommends that MFIs should ensure that they put in place the necessary measures to mitigate market risk variables and financial leverage which the study found to influence financial performances. The owners and CEOs of MFIs must invest in enhancing capacities within the organization for managing risk. They need to establish a risk department that should be facilitated with the necessary training and equipped with current software for risk identification. The MFIs credit manager must endeavor to reduce the mismatch between short term variable rate liabilities (like savings deposits) and long-term fixed-rate loans. The MFIs should refinance short-term borrowings with long-term fixed-rate borrowings to minimize the interest rate fluctuations.

MFIs should engage academicians in the development of financial models or the adoption of a financial model used by commercial banks that reflects the sensitivity of the investment portfolio and loan portfolio, to test the MFIs sensitivity to changes in market risk variables among them interest rate and inflation risk exposures.

Furthermore, foreign exchange risk was found to have a significant negative effect on financial performances. The MFI Investments manager must ensure they seek foreign loans only when they have exhausted loans from local sources. Due to the severity of the downward risk of foreign exchange, MFI should avoid loan portfolio with foreign currency.

The CEO and investors must embrace the commodity market which involves the use of financial derivatives to hedge foreign exchange fluctuations.

The study found that financial leverage risk affects financial performance. The management of MFIs should strive to have optimal financial leverage which will enable the organization to generate enough income for better financial performance. The managers should also ensure that the MFIs grow by increasing the customer base, asset base and several outlets so that they improve on their financial performances.

The study found that firm size moderates the relationship between market risk and financial performance. The CEOs of MFIs must always ensure that the organization operates within an optimal size which generates enough income to maintain good financial positions. Finally, the study recommends that other researchers and academicians in the field of finance can use the findings in this study to enhance the robustness in analyzing financial performance by establishing the interaction effect between the regressors on the dependent variable.

5.6 Suggestions for further research

This study helped to analyze the effect of market risk and financial leverage on the financial performance of microfinance institutions in Kenya. It also sought to analyze the moderating effects of firm size on the relationship between market risk, financial leverage and financial performances. The study did not include all the risks associated with MFIs, hence there is a need to analyze the effect of other risks which include compliance and legal, technological, reputational and strategic risks.

This study also captured the only available secondary data for the period between 2014 to 2018 which are in CBK records and a further study is recommended to include a longer

period for the time series data. This would help in capturing the potential effects across the economic cycles.

Future research should focus on validating the findings and conclusion of this study by undertaking replicative research in other organizations and sectors in Kenya. Besides, further research should be carried out to investigate the moderating role of other variables on the relationship between market risk and financial performance.

REFERENCES

Abd, E. (2015). The Regulatory and Supervision Framework of Microfinance in Kenya. *International Journal of Social Science Studies, Vol. 3*(5), 123–130. https://doi.org/10.11114/ijsss.v3i5.1004

Abdelkader, B., Salem, H., & Mohamed, J. (2014). Microfinance Institutions' Efficiency in the MENA Region: A Bootstrap-DEA Approach. *Research Journal of Finance and Accounting, Vol. 5*(6), 179–191. http://hdl.handle.net/10419/69525

Abdellahi, S., Mashkani, A., & Hosseini, S. (2017). The effect of credit risk, market risk, and liquidity risk on the financial performance of the listed banks on the Tehran Stock Exchange. *American Journal of Finance and Accounting, Vol .5*(1), 20–30. https://doi.org/10.1504/AJFA.2017.10007014

Abdirashid, A., & Jagongo, A. (2019). Group Lending and Loans Performance in Micro-Finance Institutions in Nairobi City County, Kenya: Case of Kenya Women Microfinance Bank Limited. *International Journal of Current Aspects, Vol. 3*(3), 96–110. https://doi.org/10.35942/ijcab.v3iIII.33

Abhay, N. (2019, December). Types of Risks faced by Microfinance Institutions. *India Microfinance*. https://indiamicrofinance.com/y/market-risk/

Abubakar, A. (2015). Relationship between financial leverage and financial performance of deposit money banks in Nigeria. *International Journal of Economics, Commerce and Management, Vol. 3*(10), 759–778. http://ijecm.co.uk/volume-iii-issue-10/

Adair, P., & Berguiga, I. (2015). The interest rates and performance of MFIs in the MENA region: Is there a moral issue. *Ethics and Economics, Vol. 12*(2), 44–66. http://hdl.handle.net/1866/12140

Aharon, D., & Yagil, Y. (2019). The Impact of Financial Leverage on Shareholders' Systematic Risk. *Sustainabilty, 11*(6548), 1–23. https://doi.org/10.3390/su11236548

Ahmed, L. (2015). The Effect of Foreign Exchange Exposure on the Financial Performance of Commercial Banks in Kenya. *International Journal of Scientific and Research Publications, Vol. 5*(11), 115–122. http://www.ijsrp.org/research-paper-1115/ijsrp-p4718.pdf

Ahmet, S. (2016). Systematic Risk in Conventional and Islamic Equity Markets. *International Review of Finance, Vol. 16*(3), 457–466. https://doi.org/10.1111/irfi.12077

Akinyomi, J., & Olagunju, A. (2013). Effect of firm size on profitability: Evidence from the Nigerian manufacturing sector. *Prime Journal of Business Administration and Management, Vol. 3*(9), 1171–1175. https://www.researchgate.net/publication/259971084

Alastair, M. (2016). *Inclusive Growth: Improving Microfinance Regulation to Support Growth and Innovation in Microenterprise* (pp. 1–52) [Informal Economy Research Observatory]. Cardiff University. https://orca.cf.ac.uk/70452/1/Kenya%20Background%20Country%20Report%20

Ali, M., Mukulu, E., Kihoro, J., & Nzulwa, J. (2016). Moderating Effect of Firm Size on the Relationship between Management Participation and Firm Performance. *The Strategic Journal of Business and Change Management, 3*(3), 223–238. www.strategicjournals.com,

Allen, F., Carletti, E., & Gale, D. (2014). Money, financial stability , and efficiency. *Journal of Economic Theory*, *Vol. 149*(1), 100–127. https://doi.org/10.1016/j.jet.2013.02.002

Almajali, Y., Alamro, S., & Al-Soub, Z. (2012). Factors Affecting the Financial Performance of Jordanian Insurance Companies Listed at Amman Stock Exchange. *Journal of Management Research*, *Vol. 4*(2), 266–290. https://doi.org/10.5296/jmr.v4i2.1482

Almarri, K., & Gardiner, P. (2014). Application of Resource-Based View to project management research: Supporters and opponents. *Procedia Social and Behavioral Sciences*, *Vol. 119*(2014), 437–445. https://doi.org/10.1016/j.sbspro.2014.03.049

Alshubiri, F. (2015). Measurement of the Impact of Financial and Business Risk on Performance: Evidence of Industrial Sector of Oman. *Asian Social Science*, *Vol. 11*(22), 26–33. https://doi.org/10.5539/ass.v11n22p26

Amelie, L. (2013). Firm Size and the Risk/Return Trade-off. *Economic Analysis (EA) Research Paper Series, Vol. 11*(1), 87–112. https://www150.statcan.gc.ca/n1/en/catalogue/11F0027M2013087

AMFI. (2017). *AMFI Members*. Association for Micro-Finance Institutions. info@amfikenya.com

Anafo, S., Bright, N., & Luu, Y. (2016). The Effect of Inflation on Mobilizations of Fund and Issue of Loans by Microfinance Institutions: A Case Study of Some Microfinance in the Upper East and Brong Ahafo Region of Ghana. *American Journal of Economics*, *Vol. 6*(6), 32–40. https://doi.org/10.5923/j.economics.20160601.05

Anand, K., & Shakeel, M. (2012). *A Comparative Analysis of the Financial Performance of Microfinance Institutions of India and Bangladesh*. Jaypee Institute of Information Technology University. http://hdl.handle.net/10603/5407

Andrea, S., & Rodrigo, G. (2015). Finding International Fisher Effect to determine the exchange rate through the Purchasing Power Parity Theory: The case of Mexico during the period 1996-2012. *Applied Econometrics and International Development*, *Vol. 15*(1), 97–110. https://ideas.repec.org/a/eaa/aeinde/v15y2015i1_8

Andrija, S., & Filip, S. (2017). A Review of the Economic Value Added Literature and Application. *Journal of Economics*, *Vol. 8*(1), 19–27. http://hdl.handle.net/10419/174163

Anghelache, C., Voineagu, V., Culeţu, D., & Baltac, G. (2013). Methods, Theories , and Models to Measure Market Risk of the Portfolio of Shares. *Romanian Statistical Review*, *Vol. 61*(8), 18–30. http://www.revistadestatistica.ro/Articole/2013/RRS_08_2013_a2_en.pdf

Anit, M., Max, N., Sonja, P., & Thomas, P. (2012). *Managing market risk: Today and tomorrow*. McKinsey & Co. https://www.mckinsey.com/business-functions/risk/our-insights/managing-market-risk-today-and-tomorrow#

Apgar, D., & Reille, X. (2010). *Microfinance Foreign Exchange Facilities: Performance and Prospects*. CGAP Publication. https://www.cgap.org/sites/default/files/CGAP-Occasional-Paper-Microfinance-Foreign-Exchange-Facilities-Performance-and-Prospects-Apr-2010.pdf

Arndt, F. (2011). Assessing dynamic capabilities: Mintzberg's schools of thought. *South African Journal of Business Management, Vol. 42*(1), 1–8. https://doi.org/10.4102/sajbm.v42i1.484

Asefa, T. (2017). Determinants of Capital Structure Decisions among Ethiopian Microfinance Institutions: Panel Data Evidence. *Journal of Business and Financial Affairs, Vol. 6*(4), 2–9. https://doi.org/10.4172/2167-0234.1000302

Asghar, G., & Saleh, Z. (2012). Normality Tests for Statistical Analysis: A Guide for Non-Statisticians. *International Journal of Endocrinology and Metabolism, Vol. 10*(2), 486–489. https://doi.org/10.5812/ijem.3505

Ashim, K., & Ranjula, B. (2014). Interest Rates and Financial Performance of Microfinance Institutions: Recent Global Evidence. *European Journal of Development Research, 26*(2014), 87–106. https://doi.org/10.1057/ejdr.2013.33

Aslam, M., Lee, A., Chandran, V., Rajah, R., & Rahman, M. (2019). History of microfinance in Bangladesh: A life cycle theory approach. *Taylor and Francis Journals, Vol . 61*(4), 703–733. https://doi.org/10.1080/00076791.2017.1413096

Atif, A., & Qaisar, M. (2015). Firms' Size Moderating Financial Performance in Growing Firms: An Empirical Evidence from Pakistan. *International Journal of Economics and Financial Issues, Vol. 5*(2), 334–339. https://www.econjournals.com/index.php/ijefi/article/view/1074

Avdulaj, K. (2011). *The Extreme Value Theory as a Tool to Measure Market Risk*. Institute of Economic Studies, Faculty of Social Sciences Charles University in Prague.

Aykut, E. (2016). The Effect of Credit and Market Risk on Bank Performance: Evidence from Turkey. *International Journal of Economics and Financial Issues*, *Vol 6*(2), 427–434. https://www.econjournals.com/index.php/ijefi/article/view/1815

Babalola, A., & Volodymyr, D. (2013). The Effect of Firm Size on Firms Profitability in Nigeria. *Journal of Economics and Sustainable Development*, *Vol. 4*(5), 90–94. https://iiste.org/Journals/index.php/JEDS/article/viewFile/4857/4935

Babu, B., & Oyaro, K. (2018). *Capping Of Commercial Bank Interest Rates and Its Impact On Number Of Loan Advances Generated By Microfinance Institutions*. United States International University-Africa. http://erepo.usiu.ac.ke/bitstream/handle/11732/3988/BERYL%20SARAH%20BABU%20MBA%202018.pdf?sequence=1&isAllowed=y

Badawi, A. (2017). Effect of Credit Risk, Liquidity Risk, and Market Risk Banking to Profitability Bank. *European Journal of Business and Management*, *Vol. 9*(29), 1–8. https://www.iiste.org/Journals/index.php/EJBM/article/view/39109/40665

Bahadur, S. (2017). *Autocorrelation*. Docsity. https://www.docsity.com/en/autocorrelation-econometrics

Baltagi, B. (2011). *Econometrics* (1 st Edition). Berlin, Germany : Springer Nature. https://doi.org/10.1007/978-3-642-20059-5

Bank for International Settlements. (2014). *The financial system at a crossroads*. Bank for International Settlements Publication. https://www.bis.org/publ/arpdf/ar2014e.pdf

Barney, J. (1991). Firm Resources and Sustainable Competitive Advantages. *Journal of Management, Vol. 17*(1), 99–120. https://doi.org/10.1177%2F014920639101700108

Beck, T. (2009). *Financial inclusion in Kenya* (pp. 1–195) [Survey results and analysis from FinAccess 2009]. FSD Kenya. https://fsdkenya.org/publication/finaccess-national-survey-2009-dynamics-of-kenyas-changing-financial-landscape/

Bengi, R., & Njenje, D. (2016). Assessment of the influence of financial factors on the growth of microfinance institutions in Bahati Sub-County, Kenya. *International Journal of Economics, Commerce and Management, Vol. 4*(No. 3), 415–438. http://ijecm.co.uk/wp-content/uploads/2016/03/4326

Blaine, S. (2018). *Microfinance Barometer 2018*. Paris : Convergence Publications. https://www.european-microfinance.org/publication/microfinance-barometer-2018

Bleady, A., Hafiez, A., & Balal, S. (2018). Dynamic Capabilities Theory: Pinning Down a Shifting Concept. *Academy of Accounting and Financial Studies Journal, Vol. 22*(2), 1–16. https://www.abacademies.org/articles/dynamic-capabilities-theory-pinning-down-a-shifting-concept-7230.html

Bourgi, S. (2019, January). Understanding Basis Risk. *Chicago : Commodity HQ Press, Jan*(23). https://commodityhq.com/education/understanding-basis-risk/

Brink, P., & Smant, D. (2011). *The expectations theory of interest rates and the European money market*. Erasmus University Rotterdam. https://pdfs.semanticscholar.org/a971/f48667ceaafe3dfb312193a63138bd2bcdc5

Brooks, C. (2008). *Introductory Econometrics for Finance* (1st Edition). Cambridge, US : Cambridge University Press.

Bryman, A., & Emma, B. (2003). *Business Research Methods* (2nd ed.). USA : Oxford University Press.

Caro, J. (2017). Effects of Macroeconomic Factors in the Performance of Micro Finance Institutions in Ecuador. *International Journal of Economics and Financial Issues*, *Vol. 7*(5), 547–551. https://www.econjournals.com/index.php/ijefi/article/view/5345

Central Bank of Kenya. (2008). *Bank Supervision Annual Report 2007*. Central Bank of Kenya. https://www.centralbank.go.ke/reports/bank-supervision-and-banking-sector-reports

Central Bank Of Kenya. (2017). *Bank Supervision Annual Report 2016*. Central Bank of Kenya.

Central Bank of Kenya. (2018). *Bank Supervision Annual Reports 2017*. Central Bank of Kenya. https://www.centralbank.go.ke/reports/bank-supervision-and-banking-sector-reports

Central Bank of Kenya. (2019). *Bank Supervisory Annual Reports 2018*. Central Bank of Kenya. https://www.centralbank.go.ke/reports/bank-supervision-and-banking-sector-reports

Changyong, F., Hongyue, W., Naiji, L., & Tian, C. (2014). Log-transformation and its implications for data analysis. *Shanghai Archives of Psychiatry, Vol. 26*(2), 105–109. https://doi.org/10.3969/j.issn.1002-0829.2014.02.009

Chatterjee, S., & Hadi, A. (2012). *Regression Analysis by Example* (5th Edition). New York : Wiley Publishers.

Chen, J. (2020). Interest Rate Risk. In *Investopedia* (April 2020). New York : Dot Dash Publishers. https://www.investopedia.com/terms/i/interestraterisk.asp

Chen, Y., Rogoff, K., & Rossi, B. (2009). *Exchange rate and Commodity price forecast*. National Bureau of Economic Research, Cambridge. https://www.nber.org/papers/w13901.pdf

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, *20*(2), 249–272. https://doi.org/10.1016/S0261-5606(00)00048-6

Coles, S. (2001). *An Introduction to Statistical Modeling of Extreme Values* (1st Edition). London: Springer Nature. https://doi.org/10.1007/978-1-4471-3675-0

Collins, C. (2020). Expanding the resource—Based view model of strategic human resource management. *The International Journal of Human Resources Management*, *Vol. 31*(2020), 1–28. https://doi.org/10.1080/09585192.2019.1711442

Constant, M., & Ibrahim, A. (2007). Usury and Just Compensation: Religious and Financial Ethics in Historical Perspective. *Journal of Business Ethics*, *Vol. 72*(2007), 1–15. https://doi.org/DOI 10.1007/s10551-006-9151-0

Cozarenco, A. (2015). Microfinance Institutions and Banks in Europe: The story to date. *Research Institute in Management Science*, *Vol. 15*(25), 1–53. https://dipot.ulb.ac.be/dspace/bitstream/2013/205339/3/wp15027

Cromwell, J., Labys, W., & Terreza, M. (2011). *Quantitative Applications in the Social Sciences: Univariate tests for time series models* (1st Edition, Vol. 99). Thousand Oak: Sage Publications. https://dx.doi.org/10.4135/9781412986458.n2

Curtis, P. (2018). Inflation Risk. *New York: Wall Street Oasis Publication*. https://www.wallstreetoasis.com/finance-dictionary/what-is-inflation-risk

Daniela, C., & Mircea, M. (2012). Assessment of Financial Risk in Firm's Profitability Analysis. *Economy Transdisciplinarity Cognition, Vol. 15*(2), 58–67. http://www.ugb.ro/etc/etc2012no2/11_Solomon,_Muntean_final.pdf

David, K., & Muendo, D. (2018). Effect of Central Bank of Kenya regulations on the financial performance of Microfinance banks. *Strategic Journal of Business and Change Management, Vol. 5*(1), 584–623. http://strategicjournals.com/index.php/journal/article/view/638/657

Delong, B., & Olney, M. (2004). *Macroeconomics* (2nd Edition). New York : McGraw Hill Irwin. https://delong.typepad.com/delong-olney-2nd-ed-chs-1-3.pdf

Denice, P., & Cheryl, B. (2010). Generalization in Quantitative and Qualitative Research: Myths and Strategies. *International Journal of Nursing Studies, Vol. 47*(11), 1451–1458. https://doi.org/10.1016/j.ijnurstu.2010.06.004

Dhawan, S. (2018). *Impact of rising interest rates on a fixed income, equity, and debt mutual fund investors*. Economic Times. https://economictimes.indiatimes.com/wealth/invest/impact-of-rising-interest-rates-on-fixed-income-equity-and-debt-mutual-fund-investors/articleshow/64284791.cms

Diogo, R. (2018). *Beyond Modern Portfolio Theory*. Colorado, USA : HackerNoon Press. https://hackernoon.com/beyond-modern-portfolio-theory-f34d35197d2

Dodor, C., Tsorhe, D., Adede, T., Thywill, & Carkson. (2017). Accessing Risks to Microfinance Institutions (MFIs) in Ghana: Findings from a Risk Assessment

Survey of Ho Municipality. *EPRA International Journal of Multidisciplinary Research, Vol. 3*(7), 1–10. https://eprajournals.com/article-archives.php?&month=July&year=2017&jid=1

Don, P. (2010). *Secondary Data Problems and Tips to Handle Them in Research and Studies*. https://studylib.net/doc/10143044/secondary-data-problems-and-tips-to-handle-them-in-research

Dudovskiy, J. (2018). *The Ultimate Guide to Writing a Dissertation in Business Studies: A Step-by-Step Assistance* (1st. Edition). USA: Research - Methodology Net. https://research-methodology.net/about-us/ebook/

Emre, A., Benedict, C., Niko, H., & Rafel, M. (2019). *Do Interest Rate Controls Work? Evidence from Kenya*. International Monetary Fund. https://www.imf.org/en/Publications/WP/Issues/2019/05/31/Do-Interest-Rate-Controls-Work-Evidence-from-Kenya-46877

Estasy, B., Narasimbham, B., & Tufano, P. (1996). *Interest rate exposure and Bank mergers*. The Wharton Financial Institutions Center's conference on Risk Management in Banking, October 13-15, 1996., Boston: Wharton School. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.4543&rep=rep1&type=pdf

Faisal, H. (2010, April 20). Microfinance can play a big role in bridging the rich-poor gap. *Saudi Arabia : Arab News*. https://www.arabnews.com/node/342762

Fazil, H. (2018). How to measure firm size? *Research Gate - Firm Size*. https://www.researchgate.net/post/How_to_measure_firm_size

Field, A. (2009). *Discovering statistics using SPSS.* (3rd Edition). London : Sage Publications.

https://books.google.co.ke/books/about/Discovering_Statistics_Using_SPSS.html?id=a6FLF1YOqtsC&redir_esc=y

Flosbach, J. (2014). *Profitability and Interest Rates: Does the Commercialization of Microfinance Institutions Lead to Higher Interest Rates?* FinDev Gateway. https://www.findevgateway.org/paper/2013/06/profitability-and-interest-rates-does-commercialization-microfinance-institution-lead

Funda, S. (2010). An empirical investigation of the relationship among P/E ratio, stock return, and dividend yields for the Istanbul Stock Exchange. *International Journal of Economics and Finance Studies, Vol. 2*(1), 15–23. http://www.sobiad.org/ejournals/journal_IJEF/archieves/2010_1/03funda_h_sezgin

Gabriela, C., Annette, K., & Ondřej, D. (2018). Performance of microfinance institutions in Europe—Does social capital matter? *Socio-Economic Planning Sciences, Vol. 30*(40), 2–15. https://doi.org/10.1016/j.seps.2018.11.007

Galina, I., Margarita, V., Ilya, A., Kristina, G., & Dina, K. (2015). Risk Management Problems of Microfinance Institutions. *International Journal of Economics and Financial Issues, 2015*(5), 151–158. https://www.econjournals.com/index.php/ijefi/article/view/1705

Gbadamosi, W. (2016). *Corporate Social Responsibility and Financial Performance of Banks in the United States*. Doctoral Dissertation, Walden University. https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=3315&context=dissertations

Ghosh, A. (2012). *Managing Risks in Retail and Commercial Banking* (1st ed.). Singapore : John Wiley and Sons. 10.1002/9781119199250

Gietzen, T. (2017). The Exposure of Microfinance Institutions to Financial Risk. *Review of Development Finance*, *Vol. 7*(2), 120–133. https://doi.org/10.1016/j.rdf.2017.04.001

Gilli, M., & Kellezi, E. (2006). An Application of Extreme Value Theory for Measuring Financial Risk. *Computational Economics*, *Vol. 27*(1), 207–228. https://link.springer.com/article/10.1007/s10614-006-9025-7

Gonzalez, A., & Gaul, S. (2011). *Responsible Financial Performance: Growth and Profits*. Microfinance Information Exchange (MIX). https://www.findevgateway.org/sites/default/files/publications/files/mfg-en-paper-responsible-financial-performance-growth-and-profits-2011

Gorgol, J. (2017). Dynamic Capabilities Approach Review: The Emperor's New Clothes or the Problems with Royalty. *Management Science Review*, *Vol. 1*(30), 4–15. https://doi.org/10.15611/noz.2017.1.01

Government of Kenya. (2008). *Kenya Vision 2030*. Nairobi, Kenya : Government Printers.

Green, W. (2008). *Economic Analysis* (5th Edition). New Jersey : Prentice-Hall Publications.

Gujarati, D. (2003). *Basic Econometrics* (4th Edition). New York : McGraw Hill Irwin.

Harelimana, J. (2017). The Role of Risk Management on Financial Performance of Banking Institutions in Rwanda. *Business and Economics Journal*, *Vol. 8*(1), 2–5. https://doi.org/10.4172/2151-6219.1000284

Haroon, R. (2015). The Impact of Inflation on Financial Development. *International Journal of Innovation and Economic Development, Vol. 1*(4), 42–48. https://doi.org/10.18775/ijied.1849-7551-7020.2015.14.2004 U

Hayes, A. (2019). Microcredit. *Microcredit, November 2019*(2019). https://www.investopedia.com/terms/m/microcredit.asp

He, L., Fayman, A., & Casey, M. (2014). Bank Profitability: The Impact of Foreign Currency Fluctuations. *Journal of Applied Business and Economics*, *Vol. 16*(2), 98–104. http://www.na-businesspress.com/JABE/he_abstract.html

Helms, B. (2006). *Access for All- Building Inclusive Financial System*. Washington : The International Bank For Reconstruction and Development/ The World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/6973/350310REV0Access0for0All01OFFICIAL0USE1.pdf?sequence=1&isAllowed=y

Holton, G. (2013). Portfolio Theory. *Online Press : Glyo Holton.Com*. https://www.glynholton.com/notes/portfolio_theory/

Howell, K. (2013). *An Introduction to the Philosophy of Methodology* (ist Edition). Sage Publications. https://dx.doi.org/10.4135/9781473957633

Hussan, J. (2016). Impact of Leverage on Risk of the Companies. *Journal of Civil and Legal Sciences*, *Vol. 5*(4), 1–3. https://doi.org/10.4172/2169-0170.1000200

Hyunmi, J. (2019). The Impact of Interest Coverage Ratio on Value Relevance of Reported Earnings: Evidence from South Korea. *Sustainabilty, 11*(7193), 2–11. https://doi.org/doi:10.3390/su11247193

Idoliany, F., & Wiryono, S. (2014). The Effect of Credit Risk and Interest Rate Risk on Micro Finance Institution's Financial Sustainability: The case of Middle

Conventional Bank Perkreditan Rakyat with three different categories of assets. *Journal of Business and Management, Vol. 3*(1), 33–48. https://journal.sbm.itb.ac.id/index.php/jbm/article/viewFile/1082/732

Ifeanyi, N., & Chukwuma, U. (2016). An Empirical Analysis of Inflationary Impacts on Profitability and Value of Selected Manufacturing Firms in Nigeria. *Research Journal of Finance and Accounting, 7*(12), 19–26. https://iiste.org/Journals/index.php/RJFA/article/view/31508/32348

Inekwe, J. (2019). Lending Risk in MFIs: The Extreme Bounds of Microeconomic and Macroeconomic Factors. *Journal of Small Business Management, Vol. 57*(2), 538–558. https://doi.org/10.1111/jsbm.12401

Ioan, T., Andreea, M., & Ioana, S. (2015). The assessment of market risk in the context of the current financial crisis. *Procedia Economics and Finance, Vol.32*(2015), 1391–1406. https://doi.org/10.1016/S2212-5671(15)01516-6

Jacobs, B., & Levy, K. (2014). The unique risks of portfolio leverage: Why modern portfolio theory fails and how to fix it. *The Journal of Financial Perspectives, Vol. 2*(3), 113–126. https://econpapers.repec.org/RePEc:ris:jofipe:0056

Jamal, A., Noor, M., & Ali, A. (2014). The Impact of Financial Risks on the Firms' Performance. *European Journal of Business and Management, Vol. 6*(5), 97–101. https://iiste.org/Journals/index.php/EJBM/article/view/10917/11220

Jeffrey, A. (2005). *The role of the natural rate of interest in monetary policy*. BIS working paper no. 171 : Bank for International Settlements. https://econpapers.repec.org/RePEc:bis:biswps:171

Jim, F. (2019). *Regression Analysis: An Intuitive Guide for Using and Interpreting Linear Models.* (1st ed.). USA : E- book.

Kagan, J. (2020, April). Microfinance. *Investopedia*, *2020*(April 2020).

Kahihu, P., Wachira, D., & Muathe, S. (2020). Market Risks, Firms' Size and Financial Performance: Reality or Illusion in Microfinance Institutions in Kenya. *International Journal of Economics and Finance*, *Vol. 12*(No. 11), 118–130. https://doi.org/10.5539/ijef.v12n11p

Kallianiotis, I. (2018). Exchange Rate Expectations. *Journal of Applied Finance & Banking*, *Vol. 8*(2), 101–134. https://econpapers.repec.org/RePEc:spt:apfiba:v:8:y:2018:i:2:f:8_2_5

Kamau, F., & Njeru, A. (2016). Effect of Liquidity Risk on Financial Performance of Insurance Companies Listed at the Nairobi Securities Exchange. *International Journal of Science and Research*, *Vol. 5*(10), 867–872. https://www.ijsr.net/get_abstract.php?paper_id=ART20162288

Kamau, P., Inanga, E., & Rwegasira, K. (2015). Currency risk impact on the financial performance of multilateral banks. *Journal of Financial Reporting and Accounting*, *Vol. 13*(1), 91–118. https://doi.org/RePEc:eme:jfrapp:v:13:y:2015:i:1:p:91-118

Kamboj, S., Goyal, P., & Rahman, Z. (2015). A resource-based view on marketing capability, operations capability, and financial performance: An empirical examination of mediating role. *Procedia Social and Behavioral Sciences*, *Vol. 189*(2015), 406–415. https://doi.org/10.1016/j.sbspro.2015.03.201

Kariuki, M., & Ngahu, S. (2016). Effect of Interest rate on Loan Performance Of Micro Finance Institutions in Naivasha Sub-County, Kenya. *International Journal of Economics, Commerce and Management*, *Vol. 4*(4), 549–566. http://ijecm.co.uk/wp-content/uploads/2016/04/4432

Kemisola, O., Osundina, A., Jayeoba, O., & Olayinka, M. (2016). Exchange Rate Volatility and Banks Performance: Evidence from Nigeria. *International Journal of Economics and Business Management, Vol. 2*(4), 1–12. https://www.researchgate.net/publication/306323334_Exchange_Rate_Volatility_and_Banks_Performance_Evidence_from_Nigeria

Kerlinger, F., & Lee, H. (2000). *Foundations of behavioral research* (4th Edition). Fort Worth : Harcourt College Publishers.

Khan, J. (2017). *Research philosophy*. New Delhi, India : APH Publishing. https://www.coursehero.com/file/47706944/researchphilosophy-slides-170924143731pdf/

Kheder, A. (2011). Financial leverage and systematic risk. *African Journal of Business Management, Vol. 5*(15), 6648–6650. https://doi.org/10.5897/AJBM11.335

Kihara, D., & Mwangi, M. (2017). Effect of interest rates on the financial performance of commercial banks in Kenya. *International Journal of Finance and Accounting, Vol. 2*(4), 19–35. https://doi.org/243-1-1119-1-10-20170202

Kihara, M., & Muturi, W. Dr. (2016). The Effect of Foreign Exchange Risk Managemant Techniques on The Financial Performance of Commercial banks in Kenya. *International Journal of Social Sciences and Information Technology, 2*(4).

King'ori, S., Kioko, W., & Shikumo, H. (2017). Determinants of Financial Performance of Microfinance Banks in Kenya. *Research Journal of Finance and Accounting, Vol.8,*(16), 1–8. https://iiste.org/Journals/index.php/RJFA/article/view/38477

Kipesha, E. (2013). Impact of Size and Age on Firm Performance: Evidence from Microfinance Institutions in Tanzania. *Research Journal of Finance and Accounting*, *Vol. 4*(5), 105–128. https://www.iiste.org/Journals/index.php/RJFA/article/view/5091

Kipkoech, B., & Muturi, W. (2014). Determinants of the financial performance of microfinance institutions in Kenya: A case of microfinance institutions in Nakuru Town. *International Journal of Accounting and Financial Management Research*, *Vol. 4*(6), 1–16. www.tjprc.org

Kivunja, C., & Kuyuni, A. (2017). Understanding and Applying Research Paradigms in Educational Contexts. *International Journal of Higher Education*, *Vol. 6*(5), 26–32. https://doi.org/10.5430/ijhe.v6n5p26

Kocenda, E., & Cerny, A. (2017). *Elements of Time Series Econometrics* (1st Edition). Prague : Karolinum Press. RePEc:eee:ecosys:v:33:y:2009:i:2:p:185-187

Kolapo, F., & Fapetu, D. (2015). The influence of interest rate risk on the performance of deposit money banks in Nigeria. *International Journal of Economics, Commerce and Management*, *Vol. 3*(5), 1218–1228. http://ijecm.co.uk/wp-content/uploads/2015/05/3580.pdf

Koncova, M., Hedija, V., & Fiala, R. (2016). Firm Size as a Determinant of Firm Performance: The Case of Swine Raising. *Agris On-Line Papers in Economics and Informatics*, *8*(3), 77–89. https://doi.org/10.7160/aol.2016.080308.

Kono, H., & Takahashi, K. (2010). Microfinance Revolution: Its Effects, Innovations, and Challenges. *Wiley Online Library*, *Vol. 8*(1), 15–73. https://doi.org/10.1111/j.1746-1049.2010.00098.x

Kraaijenbrink, J., Spender, J., & Groen, A. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, *Vol. 36*(1), 349–372. https://doi.org/10.1177%2F0149206309350775

Ksenija, D. (2013). Profitability during the Financial crisis: Evidence from Regulated Capital Market in Serbia. *South - Eastern Europe Journal of Economics*, *Vol. 12*(1), 7–33. https://econpapers.repec.org/RePEc:seb:journl:v:12:y:2014:i:1:p:7-33

Kurnia, J. (2013). *Emerging trends in microfinance*. online press : Zidisha Word Press. https://zidisha.wordpress.com/2013/01/11/emerging-trends-in-microfinance/

Lambe, I. (2015). Assessing the Impact of Exchange Rate Risk on Banks Performance in Nigeria. *Journal of Economics and Sustainable Development*, *Vol. 6*(6), 1–14. http://iiste.org/Journals/index.php/JEDS/article/download/21044/21638

Lin, H., & Chang, H. (2016). Analysis of the correlation between operational risks and operational performance: Results were obtained by comparing independent banks with the financial holding subsidiary banks. *International Journal of Business and Commerce*, *Vol. 4*(8), 1–16. https://www.ijbcnet.com/4-8/IJBC-15-4705.pdf

Madhani, P. (2010). Resource—Based View (RBV) of Competitive Advantage—An Overview. *Indian Management Research Journal*, *1*(2), 2–12. http://ssrn.com/abstract=1504379

Maina, G., Kiragu, D., & Riro, K. (2019). Relationship between firm size and profitability of commercial banks in Kenya. *International Journal of Economics, Commerce and Management*, *Vol. 7*(5), 249–262. http://ijecm.co.uk/wp-content/uploads/2019/05/7514

Maja, P., & Josipa, V. (2012). Influence of Firm Size on its Business Success. *Croatian Operational Research Review*, *Vol. 3*(1), 213–224. http://orcid.org/0000-0002-2536-8317

Mangold, R. (2016). Do microfinance investment managers add value, and how? *Enterprise Development and Microfinance*, *Vol. 27*(4), 298–321. https://dialnet.unirioja.es/servlet/articulo?codigo=5884493

Mankiw, G. (2010). *Macroeconomics* (7th edition). New York : Worth Publishers. https://www.academia.edu/34784803/N_Gregory_Mankiw_Macroeconomics_7th_Edition

Mansour, Z., Somayeh, H., & Mohammed, H. (2014). The Shadow Economy and Globalization: A Comparison Between Difference GMM and System GMM Approaches. *International Journal of Business and Development Studies*, *Vol. 6*(No. 2), 41–57. https://ijbds.usb.ac.ir/article_1948_a2c12407d7eb34756b62cfc31733daab.

Marin, M. (2019). Financial Leverage and Risk. *Florida, USA: Gateway Commercial Finance*. https://gatewaycfs.com/bff/financial-leverage-and-risk

Mbabazize, P., Twesige, D., & Ekise, I. (2014). The Role Of Foreign Exchange Risk Management On Performance Management Of Exporting Firms In Developing Countries: A Case Study Of Uganda's Exporting Firms. *Research*

Journali's Journal of Economics, *Vol. 2*(3), 1–18. http://www.researchjournali.com/

Mbuvi, V., & Wamiori, G. (2017). Effect of financial risk on the corporate value of microfinance banks in Kenya: A survey of microfinance banks in Mombasa town. *International Journal of Social Science and Information Technology*, *Vol. 3*(8), 2251–2261. https://www.ijssit.com/main/wp-content/uploads/2017/10/Effect-Of-Financial-Risks-On-Corporate-Value-In-Microfinance-Banks-In-Kenya

Mesut, D. (2013). Does Firm Size Affect Firm Profitability? Evidence From Turkey. *Research Journal of Finance and Accounting*, *Vol. 4*(4), 53–60. https://www.iiste.org/Journals/index.php/RJFA/article/view/4977

Microfinance Barometern Report. (2018). *Microfinance Barometer 2018*. Paris, France : Convergences Publication. http://www.convergences.org/wp-content/uploads/2018/09/BMF_2018_EN_VFINALE.pdf

Mirza, S., & Javed, A. (2013). Determinants of the financial performance of a firm: Case of Pakistani stock market. *Journal of Economics and International Finance*, *Vol. 5*(2), 43–52. https://doi.org/10.5897/JEIF12.043

Mishra, M. (2019). *Regression: An Explanation of Regression Metrics And What Can Go Wrong*. Toronto, Ontario : Towards Data Science .com. https://towardsdatascience.com/regression

Mohammeda, H., & Knapkovaa, A. (2016). The Impact of Total Risk Management on Company's Performance. *Procedia Social and Behavioral Sciences, Vol. 220*(2016), 271–277. https://doi.org/10.1016/j.sbspro.2016.05.499

Moh'd, A., & Karim, M. (2017). Currency Risk and Microcredit Interest Rates. *Emerging Market Reviews, Vol. 31*(C), 80–95. https://doi.org/10.1016/j.ememar.2017.03.001

Mohita, K. (2019). *Global Outreach and Financial Performance Benchmark Report 2017-2018*. MIX Organisation. https://www.findevgateway.org/paper/2019/05/global-outreach-and-financial-performance-benchmark-report-2017-2018

Mokoro, J., Nyaoga, R., Magutu, P., Khoya, O., & Onsongo, C. (2010). The Transition from micro-financing into formal banking among the microfinance institutions in Kenya. *African Journal of Business and Management*, *1*(2010), 55–70. http://www.aibuma.org/journal/index.htm

Muathe, S., Wawire, N., & Ofafa, G. (2010). *The determinants of Adoption of Information and Communication Technology by Small and Medium Enterprises within the Health Sector in Nairobi, Kenya*. Kenyatta University. http://ir-library.ku.ac.ke/handle/123456789/184972010

Mudanya, L., & Muturi, W. (2018). Effects of Financial Risks on the profitability of Commercial banks listed on Nairobi Security Exchange. *Journal of Social Sciences Management and Entrepreneurship, Vol. 5*(1), 75–93. https://www.sagepublishers.com/index.php/ijssme/article/view/18

Muela, S., Martín, C., & Sanzc, R. (2017). An application of extreme value theory in estimating liquidity risk. *European Research on Management and Business Economics, Vol. 23*(3), 157–164. https://doi.org/10.1016/j.iedeen.2017.05.001

Mugenda, O., & Mugenda, A. (2003). *Readings in Research Methods: Quantitative and Qualitative Approaches.* (1st Edition). Nairobi : African Centre for Technology Studies.

Mugo, D., Muathe, S., & Waithaka, S. (2018). Effect of Mobile Communication Services on Performance of Saccos in Kenya. *European Scientific Journal*, *14*(30), 46–62. https://doi.org/10.19044/esj.2018.v14n30p46

Murage, J., Muya, J., & Mogwambo, V. (2018). The effect of interest rates on the financial performance of Deposit—Taking SACCOs in Kisii County, Kenya. *International Journal of Social Sciences and Information Technology*, *Vol. 4*(10), 108–116. http://www.ijssit.com/

Muriithi, J., & Kiarie, W. (2017). Have the Portfolio Diversification Strategies of Kenyan Microfinance Banks Failed? *Kenyan Microfinance Banks*. https://www.microsave.net/2017/09/17/

Muriithi, J., Muturi, W., & Waweru, K. (2016). The Effect of Market Risk on Financial Performance of Commercial Banks in Kenya. *Journal of Finance and Accounting*, *Vol. 4*(4), 225–233. https://doi.org/10.11648/j.jfa.20160404.18

Musau, S., Muathe, S., & Mwangi, L. (2017). Financial Inclusion, GDP, and Credit Risk of Commercial Banks in Kenya. *International Journal of Economics and Finance*, *6*(12), 58–70. https://doi.org/10.5539/ijef.v10n3p181

Musau, S., Muathe, S., & Mwangi, L. (2018). Financial Inclusion, Bank Competitiveness, and Credit Risk of Commercial Banks in Kenya. *International Journal of Financial Research*, *9*(1), 203–218. https://doi.org/10.5430/ijfr.v9n1p203

Musiega, M., Olweny, T., Mukanzi, C., & Mutua, M. (2017). Influence of interest rate risk on the performance of commercial Banks in Kenya. *Economics and Finance Review*, *Vol. 5*(2), 14–23. http://hdl.handle.net/123456789/4616

Mutende, E., Mwangi, M., & Ochieng, D. (2017). The moderating role of firm characteristics on the relationship between free cash flows and financial performance of firms listed at the Nairobi securities exchange. *Journal of Finance and Investment Analysis*, *Vol. 6*(4), 55–74. https://ideas.repec.org/a/spt/fininv/v6y2017i4f6_4_3.html

Mutunga, D., & Owino, E. (2017). Moderating Role of Firm Size on the relationship between Micro Factors and Financial Performance of Manufacturing Firms in Kenya. *Journal of Finance and Accounting*, *Vol. 1*(2), 14–27. http://41.89.49.13:8080/xmlui/handle/123456789/1248

Namasake, K., & Karanja, J. (2016). *The Effect of Market Risk to the Financial Performance of Commercial Banks in Kenya*. The University of Nairobi. http://hdl.handle.net/11295/100394

Nason, R., & Wiklund, J. (2018). An Assessment of Resource-Based Theorizing on Firm Growth and Suggestions for the Future. *Journal of Management*, *Vol. 44*(1), 32–60. https://doi.org/10.1177/0149206315610635

Naveen, K., Manjunath, S., & Srikanth, H. (2012). Microfinance: A comparative study of Bangladesh and India. *IOSR Journal of Business and Management*, *Vol. 5*(6), 27–35. http://www.iosrjournals.org/iosr-jbm/papers/Vol5-issue6/C0562735.pdf?id=5361

Naz, F., Ijaz, F., & Naqvi, F. (2016). Financial performance of firms: Evidence from Pakistan cements industry. *Journal of Teaching and Education*, *Vol. 5*(1), 81–94. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2788357

Ndegwa, C., Waweru, G., & Huka, G. (2016). Influence of Interest Rate on Financial Performance of MFI'S in Imenti North Sub County, Kenya. *International Journal of Economics, Commerce and Management*, *Vol. 4*(2), 289–305. http://ijecm.co.uk/wp-content/uploads/2016/11/41120

Neil, S. (2010). *Encyclopedia of Research Designs* (1st Edition, Vol. 1). Thousand Oaks, CA : Sage Publications. 10.4135/9781412961288

Ngalawa, J., & Ngare, P. (2014). Interest Rate Risk Management for Commercial Banks in Kenya. *IOSR Journal of Economics and Finance*, *Vol. 4*(No. 1), 11–21. http://www.iosrjournals.org/iosr-jef/papers/vol4-issue1/B0411121.

Ngari, F. (2011). *The effect of foreign exchange exposure on a Firm's financial performance: A case of listed companies in Kenya*. KCA University. http://41.89.49.13:8080/xmlui/handle/123456789/656

Nimalathasan, B., & Pratheepkanth, P. (2012). Systematic Risk Management and Profitability: A Case Study of Selected Financial Institutions in Sri Lanka. *Global Journal of Management and Business Research*, *Vol. 12*(17), 1–5. http://hdl.handle.net/123456789/601

Niresh, A. (2012). The trade-off between Liquidity and profitability: A Study of selected manufacturing firms in Sri Lanka. *Journal of Arts, Science, and Commerce*, *Vol. 3*(4), 2–12. https://www.questia.com/read/1P3-2885706411/trade-off-between-liquidity-profitability-a-study

Njuguna, J., Gakure, R., Waititu, A., & Katuse, P. (2017). Financial risk management strategies and the growth of the microfinance sector in Kenya. *Journal of Accounting*, *Vol. 2*(1), 23–55. https://carijournals.org/journals/index.php/JACC/article/view/118/226

Nzioka, O., & Maseki, F. (2017). Effects of Hedging Foreign Exchange Risk on Financial Performance of Non-Banking Companies Listed at the Nairobi Securities Exchange. *European Scientific Journal*, *Vol. 13*(10), 402–417. https://doi.org/10.19044/esj.2017.v13n10p402

Ochieng, N., & Ntoiti, J. (2016). Effect of foreign hedging practices on the financial performance of non-financial firms: A case study of listed companies at the Nairobi Securities Exchange. *The Strategic Journal of Business and Change Management*, *Vol. 3*(4), 365–381. http://strategicjournals.com/index.php/journal/article/view/330

Odeke, S., & Odongo, J. (2014). Interest Rate Risk Exposure and Financial Performance of Commercial Banks in Uganda. *Research Journal of Finance and Accounting*, *Vol. 5*(2), 167–181. https://iiste.org/Journals/index.php/RJFA/article/viewFile/10691/10896

Olawale, L., Ilo, B., & Lawal, F. (2017). The effect of firm size on the performance of firms in Nigeria. *The IEB International Journal of Finance*, *Vol. 15*(4), 2–21. https://doi.org/DOI: 10.5605/IEB.15.4

Oliver, J. (2014). Dynamic Capabilities and Superior Firm Performance in the UK Media Industry. *Journal of Media Business Studies*, *Vol. 11*(2), 57–77. https://doi.org/10.1080/16522354.2014.11073580

Ololube, N. (2016). *Organizational Justice and Culture in Higher Education Institutions* (1 st Edition). Chicago, USA : IGI Global Publisher. 10.4018/978-1-4666-9850-5

Olweny, T., Mukanzi, C., & Mutua, M. (2017). The influence of interest rate risk on the performance of commercial Banks in Kenya. *Economics and Finance Review*, *Vol. 5*(No. 2), 14–23. http://www.businessjournalz.org/efr

Omisore, I., Munirat, Y., & Nwufo, C. (2012). The Modern Portfolio Theory as an investment decision tool. *Journal of Accounting and Taxation*, *4*(2), 19–28. https://doi.org/10.5897/JAT11.036

Omondi, D. (2019, January). Mobile lenders drive microfinance into early graves. *Nairobi : The Standard Media Press*, Business Daily. https://www.standardmedia.co.ke/article/2001309493

Omondi, N., & Makori, D. (2019). Effect of financial risks on Kenya's commercial banks' financial performance. *International Journal of Scientific and Education Research*, *Vol. 3*(No. 4), 1–15. http://ijsernet.org/

Ondiek, S., & Muathe, S. (2017). Risk Management Strategies and Performance of Small Scale Agribusiness Firms in Kiambu County. *Journal of Strategic Management*, *1*(2), 85–104. https://doi.org/01933509c54272189fd73dcbc898db3719f0

Onsongo, S., Mwangi, L., & Muathe, S. (2019). Firm Size, Operational Risk and Financial Performance: Evidence from Commercial, and Services companies listed in Nairobi Securities Exchange. *International Journal of Current Aspects*, *3*(6), 372–379. https://doi.org/10.35942/ijcab.v3iVI.93

Pacini, K., Mayer, P., Attar, S., & Azam, J. (2017). Macroeconomic factors and firm performance in the United Kingdom. *Journal of Smart Economic Growth*, *Vol. 2*(3), 1–7. https://dx.doi.org/10.2139/ssrn.3013944

Parlak, D., & Ilhan, H. (2015). Foreign exchange risk and financial performance: The case of Turkey. *International Review of Economics and Management*, *Vol. 4*(2), 1–15. https://doi.org/DOI: 10.18825/irem.37893

Pawlicz, A., & Napierala, T. (2017). The determinants of hotel room rates: An analysis of the hotel industry in Warsaw, Poland. *International Journal of Contemporary Hospitality Management*, *Vol. 29*(1), 80–93. https://doi.org/10.1108/IJCHM-12-2015-0694

Peteraf, M., Stefano, G., & Verona, G. (2013). The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic Management Journal*, *Vol. 34*(12), 1389–1410. https://doi.org/DOI: 10.1002/smj.2078

Pisano, G. (2015). A Normative Theory of Dynamic Capabilities: Connecting Strategy, Know-How, and Competition. *SSRN Electronic Journal*, *06–36*(2015), 1–42. https://doi.org/10.2139/ssrn.2667018

Podobnik, B., Horvatic, D., Petersen, A., & Stanley, H. (2009). Quantitative relations between risk, return, and firm size. *Letters Journal Exploring the Frontiers of Physics*, *Vol. 85*(2009), 1–5. https://doi.org/doi: 10.1209/0295-5075/85/50003

Pradita, A., & Geraldina, I. (2019). The potential impact of currency risk on the bank's performance in Indonesia. *International Journal of Accounting, Finance, and Business*, *Vol. 4*(24), 32–41. www.ijafb.com

Pranas, Ž., Jolita, V., & Regina, A. (2018). Philosophy and Paradigm of Scientific Research. *Intech Open, 1*(1), 121–142. https://doi.org/DOI: 10.5772/intechopen.70628 ·

Qamar, M., Farooq, U., & Akhtar, W. (2016). Firm Size as Moderator to Leverage-Performance Relation: An Emerging Market Review. *Journal of Poverty, Investment and Development, Vol. 23*(2016), 55–63. https://doi.org/DOI: 10.21512/bbr.v8i2.1711

Rahman, M., & Hoque, M. (2015). Foreign Exchange Risk Management In Banks: A Comparative Study of Some Selected Banks In Bangladesh. *International Journal of Ethics in Social Sciences, Vol. 3*(1), 92–109. https://doi.org/10.13140/RG.2.2.10590.95043/1

Rajasekar, S., Philominathan, P., & Chinnathambi, V. (2013). *Research methods* (3rd ed.). New York, USA: Cornell University. https://arxiv.org/abs/physics/0601009

Ranjit, K. (2011). *Research Methodology* (3rd Edition). London, UK : Sage publications. https://books.google.co.ke/books/about/Research_Methodology.html?id=df5cBAAAQBAJ&redir_esc=y

Reicher, C., & Utlaut, J. (2011). *The effect of inflation on real commodity prices*. Kiel, Germany : Kiel Institute for the World Economy. https://www.ifw-kiel.de/fileadmin/Dateiverwaltung/IfW-Publications/Christopher_Reicher/the-effect-of-inflation-on-real-commodity-prices/the-effect-of-inflation-on-real-commodity-prices.pdf

Rupa, R. (2016). Comparison of Financial Performance of MFI's in India and Bangladesh – Key Discriminators. *European Journal of Commerce and Management Research, Vol. 5*(1), 42–50. www.ejcmr.org

Rupa, R., & Padmaja, M. (2014). A study on the financial performance of MFIs in India. *The International Journal of Business and Management, Vol. 2*(10), 187–193. www.theijbm.com

Saeid, P., & Valian, H. (2011). Studying the Relation Between Currency Rate, Interest Rate, and Inflation Rate Based on Fischer International Theory and Effect Theory in Iran Economy. *Australian Journal of Basic and Applied Sciences, Vol. 5*(12), 1371–1378. http://www.ajbasweb.com/old/ajbas/2011/December-2011/1371-1378

Santosa, P., & Laksana, H. (2011). Value at Risk, Market Risk and Trading Activity: CAPM Alternative Model. *Journal of Applied Finance and Banking, Vol. 1*(4), 239–268. https://doi.org/Handle: RePEc:spt:apfiba:v:1:y:2011:i:4:f:1_4_11

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th edition). New York, USA : Pearson Education Limited. https://www.researchgate.net/publication/330760964_Research_Methods_for_Business_Students

Sean, R. (2019). What trends affect profitability in financials? In *Investopedia* (June 2019). New York : Dot Dash Publishers. https://www.investopedia.com/ask/answers/032315/what-are-biggest-trends-affecting-profitability-financial-services-sector.asp

Shah, C. (2015). *A study of the financial performance of selected companies of the Indian automobile industry*. Veer Narmad South Gujarat University, India. http://hdl.handle.net/10603/77019

Shamima, N., Rajah, R., Angathevar, B., & Muhammad, M. (2018). What determines the financial performance of microfinance institutions in Bangladesh? A panel data analysis. *Springer Nature*, *52*(3), 1409–1422. https://ideas.repec.org/a/spr/qualqt/v52y2018i3d10.1007_s11135-017-0528-1

Sheskin, D. (2020). *Handbook of Parametric and Non- parametric Procedures* (5th Edition). London, UK : Chapman and Hall / CRC Press. https://dl.acm.org/doi/book/10.5555/1529939

Shiller, R. (2014). Speculative Asset Prices. *American Economic Review*, *104*(6), 1486–1517. https://doi.org/DOI: 10.1257/aer.104.6.1486

Singh, A., Allen, D., & Robert, P. (2013). Extreme market risk and extreme value theory. *Mathematics and Computer in Simulation on Science, Vol. 94*(2013), 310–328. https://doi.org/10.1016/j.matcom.2012.05.010

Siswanti, I., Eko, G., & Embun, P. (2015). The Impact of Macro Economy on Firm Values and Financial Performance as an Intervening Variable: An Empirical Study of LQ45 Banking Industries in Indonesia. *Global Journal of Business and Social Science Review*, *Vol. 3*(3), 88–94. https://ssrn.com/abstract=3001756

Solomon, B., Hitoshi, K., & Masahiro, S. (2019). Performance of Microfinance Institutions in Ethiopia: Integrating Financial and Social Metrics. *Multidisciplinary Digital Publishing Institute*, *Vol. 8*(4), 1–13. https://doi.org/10.3390/socsci8040117

Stanculesco, D., & Gibson, L. (2011). *Micro Finance in East Africa: Schemes for women in the coffee sector* (SC-11-195.; p. 46). Geneva, Germany : International Trade Centre. https://www.findevgateway.org/paper/2011/01/microfinance-east-africa-schemes-women-coffee-sector

Sujani, T., Stuart, L., & Krishna, R. (2017). Financial performance of microfinance institutions: Does gender diversity matters? *International Journal of Gender Studies in Developing Societies, Vol. 2*(2), 1–33. https://doi.org/10.1504/IJGSDS.2017.089358

Sunday, A., Turyahebwa, A., Byamukama, E., & Novembrieta, S. (2013). Financial Performance in the Selected Microfinance Institutions in Uganda. *International Journal of Engineering Research and Technology*, *Vol. 2*(2), 2–11. https://www.ijert.org/research/financial-performance-in-the-selected-microfinance-institutions-in-uganda-IJERTV2IS2211

Taufik, A., & Siti, N. (2019). Performance of Islamic Microfinance Banks: The Case of a Developing Country. *FGIC 2nd Conference on Governance and Integrity 2019*, *2019*, 268–288. https://doi.org/10.18502/kss.v3i22.5056

Teece, D. (2018). Business models and dynamic capabilities. *Long Range Planning*, *Vol. 51*(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Ullah, M. (2016). *Heteroscedasticity Tests and Remedies*. Multan, Paistan : Itfeature Online Press. https://itfeature.com/heteroscedasticity/heteroscedasticity-tests-and-remedies

Umar, M., Danjuma, M., & Mohammad, A. (2014). Conceptual exposition of the effect of inflation on bank performance. *Journal of World Economic Research, Vol. 3*(5), 55–59. https://doi.org/doi: 10.11648/j.jwer.20140305.11

Vanroose, A., & D'Espallier, B. (2013). Microfinance and Financial Sector Development. *Taylor and Francis Journals*, *45*(15), 1965–1982. https://doi.org/RePEc:ulb:ulbeco:2013/174890

Verma, E. (2018). Financial Performance—Understanding its Concepts and Importance. *San Francisco, USA: Simplilearn Solutions Online Press*. https://www.simplilearn.com/financial-performance-rar21-article

Veton, Z., Fitor, M., & Valon, Z. (2017). Microfinance Institutions in Kosovo Regulation and Supervision Issues and Challenges. *Review of European Studies, Vol. 9*(No. 4), 94–114. https://doi.org/10.5539/res.v9n4p94

Veton, Z., Flamur, M., Omer, I., & Kazi, S. (2021). Dynamic Impact of Banking Performance on Financial Stability: Fresh Evidence from Southeastern Europe. *Journal of Central Banking Theory and Practice*, *2021*(1), 165–181. https://doi.org/10.2478/jcbtp-2021-0008

Vijitha, G. (2016). How does Financial Leverage Affect Financial Risk? An Empirical Study in Sri Lanka. *Amity Journal of Finance*, *Vol. 1*(1), 57–66. https://amity.edu/UserFiles/admaa/191Paper%205

Vivek, K., & Wadugu, D. (2016). Microfinance Institutions review of the practical performance: Study and analysis for different mobility conditions in Technology. *International Journal of Business and Applied Social Science*, *Vol. 2*(2), 68–79. www.ijbassnet.com

Vladimir, M., Boban, D., & Boris, S. (2013). *Market risk management in Banks in Serbia*. Serbia : Research Gate Publications. https://www.scribd.com/document/435251551/Market-Risk-Mgmt

Wabwile, E., Chitiavi, M., Alala, O., & Musiega, D. (2014). Financial Leverage and Performance Variance Among Banks. Evidence of Tier 1 Commercial Banks Listed On Nairobi Security Exchange Kenya. *International Journal of Business and Management Invention*, *Vol. 3*(4), 1–13. https://www.ijbmi.org/papers/Vol(3)4/Version-2/A034201013

Waqas, A., Fengming, Q., Fayyaz, A., & Abdul, R. (2018). Ownership structure and microfinance institutions' performance: A case of Latin America. *European Online Journal of Natural and Social Sciences*, *Vol. 7*(1), 127–137. http://www.european-science.com

Waseem, A., & Abdul, S. (2014). Impact of Interest Rate Changes on the Profitability of four Major Commercial Banks in Pakistan. *International Journal of Accounting and Financial Reporting*, *Vol. 4*(1), 142–154. https://doi.org/10.5296/ijafr.v4i1.5630

Waweru, M., & Wanyoike, D. (2016). The effect of capital structure on profitability of Microfinance institutions in Nakuru town, Kenya. *International Journal of Economics, Commerce and Management*, *Vol. 4*(10), 1145–1167. http://ijecm.co.uk/wp-content/uploads/2016/10/41065.pdf

Wet, J., & Tiot, E. (2010). Return on equity: A popular, but a flawed measure of corporate financial performance. *South African Journal of Business Management*, *Vol. 38*(1), 1–12. https://doi.org/DOI: 10.4102/sajbm.v38i1.578

William, C., & Khim, J. (2017). *Efficient Market Hypothesis*. Brilliant. com. https://brilliant.org/wiki/efficient-market-hypothesis/

Yong, T., & Christos, F. (2012). Bank profitability and inflation: The case of China. *Journal of Economic Studies, Vol. 29*(6), 675–696. https://doi.org/DOI: 10.1108/01443581211274610

Zulfiqar, Z., & Nizam, U. (2015). Inflation, Interest rate, and firms' performance: The evidence from the textile industry of Pakistan. *International Journal of Arts and Commerce, Vol. 4*(2), 111–116. https://ijac.org.uk/images/frontImages/gallery/Vol._4_No._2/14._111-115.pdf

APPENDICES

APPENDIX I: SECONDARY DATA COLLECTION INSTRUMENT

Secondary data for all the registered Microfinance Institution in Kenya as of 2018:

Name of the Microfinance institution

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Variables	Description	2014	2015	2016	2017	2018
Profitability ROE	EBIT					
	Total Shareholders' Equity					
Interest Rate Risk Cumulative Interest Gap	Risk Sensitive Assets					
	Risk-Sensitive Liabilities					
	Total Assets					
Foreign Exchange Risk -Foreign Exchange Exposure	Foreign Currency Assets					
	Foreign Currency Liabilities					
	Total shareholders' Equity					
Inflation rate risk -Inflation Premium	Nominal Rate					
	Real rate					
Financial Leverage Risk -Interest Covering Rate	EBIT					
	Interest Expenses paid					
MFI Size	Log of Total Asset					

APPENDIX II: RESEARCH PERMIT FROM NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & NNOVATION

Ref No: **208586**

Date of Issue: **09/December/2019**

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This is to Certify that Mr. PETER KAHIHU of St. Paul's University, has been licensed to conduct research in Nairobi on the topic: Effect of Market Risk on Financial Performance of Microfinance Institutions in Kenya for the period ending: 09/December/2020.

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APPENDIX III: MICROFINANCE INSTITUTION MARKET SHARE ANALYSIS

MFB	Market share 2017 %	Market share 2018 %
LARGE		
Kenya Women	46	41.6
Faulu	38.4	38
Rafiki	7.3	8
MEDIUM		
SMEP	3.6	4.2
Caritas	1.7	2.3
Sumac	1.7	2.2
U & I	0.9	1.1
SMALL		
Century	0.7	0.7
Key	0.5	0.7
Uwezo	0.2	0.6
Maisha	0.2	0.5
Daraja	0.1	0.1
Choice	0.1	-0.1
Total	**100**	**100**

Source: CBK 2019