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Influence of firm-level financial characteristics on credit extension by microfinance institutions: a case of Kenyan licensed microfinance banks

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INFLUENCE OF FIRM-LEVEL FINANCIAL CHARACTERISTICS ON CREDIT EXTENSION BY MICROFINANCE INSTITUTIONS: A CASE OF KENYAN LICENSED MICROFINANCE BANKS

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DECLARATION

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

WINNIE NJERI KARANJA

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Approval

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ABSTRACT

Empirical evidence has shown that the growth of the microfinance sector in Kenya has been constrained by increasing competition in the microfinance industry from other emerging models such as digital lending institutions, short-term unsecured lenders as well as micro-lending activities from commercial banks. These constraints have also resulted in shrinking lending capacity and declining profitability due to attrition of high-quality borrowers to competing lenders. However, there is limited research on the factors that affect credit extension by Kenyan microfinance banks, which is vital in understanding the dynamics of the sector. This study examined how firm-level financial characteristics influence credit extension by microfinance banks. The study sought to find out the effect of firm size, liquidity, NPLs, deposits, and interest rates on credit extension by microfinance banks. A descriptive research design was applied, focusing on the 13 licensed microfinance banks as at December 2019. Panel data was collected for the period between 2011 to 2018 from financial submissions by these microfinance banks which are published by the Central Bank of Kenya. Data analysis involved descriptive, correlation testing, and panel regression analysis. The study found that firm size and interest rates had a positive relationship with microfinance banks credit extension, while non-performing loan, liquidity and deposits were found to have a negative relationship with credit extension by licensed MFBs in Kenya. In the Panel estimation model, only Firm size and Liquidity were found to be good estimators of Credit Extension. The main recommendations from the study were that, as firm size supports the growth ambitions of a microfinance institution and the microfinance sector in general, microfinance banks should aim to maintain high asset quality of their loan book as it has an implication on the institution's ability to absorb the impact of risk, and hence affects the institution's ability to target credit extension growth. The study also recommends that, given the findings that deposit mobilisation is not a good predictor of credit extension, Microfinance banks should focus on mobilising capital from diversified sources, including low-cost funding from microfinance developmental funding institutions, as they are not able to rely on deposits as a cheap source of funding. On interest rates, while findings indicate that interest rates are not a good estimator of credit extension, care should be taken to avoid overly expensive loans so as to observe fair lending practices and support welfare of borrowers. To the regulator, the recommendation is that the sector should be watched closely to ensure liquidity levels remain above the minimum statutory level of 20% which was found to have a negative relationship with credit extension. Study limitations included the exclusion of external factors such as macroeconomic factors and competition, and the exclusion of primary data – both qualitative and quantitative.

Key words: Lending, microfinance, credit extension, financial inclusion, liquidity, deposit, non-performing loans, interest

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LIST OF ABBREVIATIONS

AMFI - Kenya	Association of Microfinance Institutions of Kenya
CBK	Central Bank of Kenya
CBR	Central Bank Rate
DTM	Deposit Taking Microfinance
FSD	Financial Sector Deepening
KES	Kenya Shilling
SACCO	Savings And Credit Cooperative
MFB	Microfinance Banks
MFI	Microfinance Institutions
NIM	Net Interest Margin
NPL	Non-Performing Loan
ROA	Return on Assets
ROE	Return on Equity

OPERATIONAL DEFINITION OF TERMS

Client Protection Principles — A set of 6 core principles that encourage MFIs to take practical steps to treat clients with fairness and respect to achieve responsible financial inclusion (Forster, Lahaye, clark, Koning, & McKee, 2010).

Credit Extension — This is operationalized as total loans and advances (Fourie & Botha, 2011) issued by microfinance banks to its borrowers as indicated in the balance sheet financial statements of each microfinance bank in Kenya

Firm size — This is operationalized as the level or capacity of a bank measured by the total assets (Schildbach, 2017)

Firm-level characteristics — These are internal or micro factors, are those that originate from the financial statements such as income statement and balance sheet (Masika & Simiyu, 2019)

Interest rate — Interest rate is the percentage amount of principle repaid to a lender for the use of its money through loans (Patterson & Lygnerud, 1999)

Liquidity — This is the bank's ability to meet its short term obligations, mainly those of depositors of funds to the bank (Ferrouhi, 2014)

Deposits — Bank deposits are claims on banks that are liabilities to the bank and belong to the bank's customers (International Monetary Fund, 2003)

Non-Performing Loans — A loan whose principle or interest has been due and unpaid for sixty days, as reported in the MFBs Financial statements in other disclosures (Central Bank of Kenya, 2019)

Microfinance This is a way of providing loans to the poor who are outside the conventional banking system (Independent Evaluation Group - World Bank Group, 2015)

CHAPTER ONE

INTRODUCTION

1.1 Introduction to the Chapter

This chapter presents the background information to the study, a summary of findings on the study variables from other relevant studies, outlines the research objectives, and summarises the scope and significance of the study.

1.2 Background of the Study

Microfinance Institutions, commonly known as MFIs, are financial organizations tailored to serve those individuals in the society who fall into the low-income bracket in terms of earning capacity. They typically have little or no access to conventional banking products (Marconatto, Cruz, & Pedrozo, 2016). Microfinance activities date back to the 1970s, where credit facilities were provided to poor farmers by government agencies and international donors and as a way of enhancing agricultural production (Chowdhury, 2009). In the mid-1980s, the microfinance sector began to incur losses, and insufficient capital inhibited its lending operations. This necessitated reforms in multiple jurisdictions that saw the integration of MFIs into the financial sector and the development of regulatory frameworks within which these MFIs would operate sustainably (Ledgerwood, 2013).

Microfinance is now considered to be one of the most effective economic development interventions that can foster financial inclusion - providing access to finance to those excluded by the commercial banking system. Since its early days, Microfinance has evolved exponentially. It is considered to be one of the most strategic approaches to fostering economic development through financial inclusion in low-income countries (Bangoura, 2012). Indeed, Microfinance can enhance access to finance for the poor - which is a crucial enabler to at least 10 of the 17 Sustainable Development Goals, as it has a direct link to poverty eradication, eliminating hunger and achieving food security, attaining universal health standards, promoting gender equality and promoting economic growth (Klapper, El-Zoghbi, & Hess, 2016).

Globally, the microfinance sector grew by 11.5% between 2009 and 2018, as the number of borrowers is estimated to have grown from 98 million in 2009 to 139 million in 2018, with an estimated loan asset of USD 124 billion in 2018 (Mix Market, 2019). However, in Kenya, the sector has shown signs of constrained growth, as noted by Maina and Ishmail (2014) who established that in Kenya, MFIs have been characterized by low efficiency levels, poor loan performance, and high financial leverage level; these factors have resulted in poor return on owners' equity.

Despite the poor performance, Kenya's Microfinance sector is among the most exciting in Sub-Saharan Africa, given the extensive network of branches and a large number of institutions (Wambugu & Ngugi, 2012). However, its role in deepening financial access in Kenya - which currently stands at 82.9% as of 2019, up from 26.7% in 2006, can be termed as minimal (Financial Sector Deepening, 2019). Over the years, innovation in the sector has not been able to keep up with the other formal financial institutions such as banks and SACCOs, informal sources such as informal groups, and, more recently, digital lending institutions.

CBK (2017) reported that there is a dramatic change in the market dynamics, which has resulted in mobile lending platforms and other emerging financial technologies driving the microfinance institutions into their grave. The pre-tax losses in the industry increased to 935 million in 2018 as compared to 171 million in 2017, fuelled by decreasing personal loan demand and tightening lending capacity within the firms. Kathomi, Maina, and Kariuki (2017) note that the exorbitant rates charged by microfinance institutions have led to a decrease in the sustainability of the institutions as most people are finding it difficult to access their facilities due to the high cost.

1.2.1 Licenced Microfinance Banks in Kenya

In East Africa, Kenya's microfinance industry is the largest, estimated to account for about 75% of the entire microfinance industry in East Africa (Mutethia, 2017). The industry is categorized into unlicensed deposit-taking MFIs and licensed deposit-taking microfinance institutions (dt-MFIs). The CBK licences deposit-taking institutions which allows them to mobilize cash deposits from the public so as to finance their lending objectives; non-deposit

taking MFIs can only carry out lending activities and are therefore not licensed by the CBK (Aduda & Kalunda, 2012).

There are 13 Microfinance banks registered by the Association of Microfinance Institutions of Kenya (AMF-Kenya) and licensed by the CBK (Central Bank of Kenya, 2017). According to the CBK, the total asset base held by licensed deposit-taking MFIs in Kenya stood at KES 70.8 billion in 2018, having increased by 4.7% from 2017 (Central Bank of Kenya, 2018). This growth follows a slump period, which saw a decline in total assets by 7% in the previous year, driven by the overall impact of the election cycle, which had a negative effect on the economy in general (Mix Market, 2019). Research on constraints to growth of MFIs indicated that high operating costs, high client drop-out rates, high non-performing loan ratios, and insufficient risk management strategies in MFIs in Kenya are the main factors constraining the growth of MFIs (Munala, 2017).

Licenced microfinance banks play an important role in the Financial System in Kenya through enhancing access to finance for consumers (individuals and MSME's) who are excluded from formal mainstream commercial bank lending; Commercial banks were in 2015 estimated to serve less than 4 million people, leaving the rest of the market unadrressed (Ali A. E., 2015). Microfinance banks operate much like commercial banks insofar as financial intermediation is concerned – i.e., collecting deposits from one customers with surplus funding and channeling these funds to customers who are in need of funding through lending (Yakubu, Omosola , & Obiezue , 2018).

This process of lending from deposits increases an MFB's funding available for further lending, referred to as credit creation, plays a significant role in an economy's monetary policy, making it crucil to understand the driver's of a lending institution's lending decisions (Yakubu, Omosola , & Obiezue , 2018). As identified by Olokoyo (2011), a bank's lending behaviour is determined by external factors such as macroeconomic factors and institutional fundamentals including central bank policy directives, as well as internal factors which control supply of lending – such as management style and financial factors (Yakubu, Omosola , & Obiezue , 2018). As this study will only be based on verifiable financial data from secondary sources, the focus will be on the internal factors of a financial nature.

1.2.2. Firm-Level Financial Characteristics of Microfinance Banks

Firm-level characteristics refer to the aspects of a firm that are affected by firm-level management (Arora, 2014). According to Athanasoglou, Brissimis, and Delis (2008), firm-level financial characteristics, also referred to as internal or micro factors, are those that originate from the financial statements such as income statements and statement of financial position. The characteristics of the firm directly affect how the firm performs both in the short-term and long-term. These include firm size, liquidity, capital including deposits (Doğan, 2013), asset quality (Yazdanfar, 2013), liquidity (Dogan, 2013) and asset tangibility, (Bresnahan, Brynjolfsson, & Hitt, 2012).

Deposits are a crucial source of lending capital for the credit-making institution, including microfinance banks, as they provide the cheapest form of capital (Shahchera, 2017). Attracting and retaining deposits – often referred to as sticky deposits – has been found to positively influence lending behaviour of financial institutions as it enables the financial institution to have access to a more stable source of capital to grow their lending activities (Olumuyiwa, Oluwatosin, & Chukwuemeka, 2012).

The size of a lending institution as measured by total assets is one of the control variables which will dictate its relationship with creditors (Davydenko, 2010). A study on determinants of bank long-term lending behaviour in Russia found that bank size was positively correlated with lending, as the larger an institution, the more flexibility it has to increase its diversification efforts by tapping into new markets and customer segments, as well as the flexibility to diversify its product offering to meet the varying needs of its customers (Chernykh & Theodossiou, 2011).

Benedicto (2017) highlights that liquidity of a lending institution is its capacity to finance its short-term obligations, mostly payable to suppliers and depositors. Firm failures have been associated with insufficient liquidity. A study on factors affecting bank lending behaviour in Nigeria found that liquidity ratio is positively and significantly correlated to the lending levels within microfinance banks because high liquidity would enable the financial institutions to withstand short-term shocks and therefore expand its supply of loans (Olumuyiwa, Oluwatosin, & Chukwuemeka, 2012).

According to Khan and Sattar (2014), interest rate affects growth either positively or negatively, depending on its movement. A decrease in interest rate to the depositors and an increase in spread discourage savings. An increase in interest rate to the depositor adversely affects the investment. Murimi (2017) indicates that the interest rate has significant effects to a bank's credit growth. The introduction of interest rate capping interferes with the market. It hinders financial institutions from giving loan products to those at the market's lower end.

Non-Performing loans result to higher levels of risk in the financial institutions' assets as it implies a declining portfolio quality. Various studies have revealed that a rise in non-performing loans (NPLs) increases the provisioning expense, which would decrease the overall profit and retained earnings of the financial institution; this is because a decline in retained earnings reduces growth in capitalisation levels, thus constrain the financial institution's ability to lend as a result of declining capital adequacy (Islam & Islam, 2018).

1.2.3 Credit Extension by Microfinance Banks

Globally, more that 100 million individuals use Microfinance institutions as sources of credit and they have managed to register impressive repayment rates on the loans, justifying the increasing number of MFIs operation in Sub-Saharan Africa granted (Cull, Demirgüç-Kunt, & Morduch, 2009). This increase in use of microfinance services has resulted in the sector being pressured to increase regulation, but complying with prudential regulations and the associated supervision has been deemed too expensive to follow by thee institutions (Yahaya & Osemene, 2011).

According to Ali (2015), the increasing level of success in the microfinance sector resulted in the government increasing incentives and funding to encourage start-ups. Some of the established ones took advantage and have grown to become full commercial entities. There was also an increase in managerial and administrative capabilities, better credit risk assessment, and an increase in the number of group investors who take large credit. The collective agreements discourage high rate of default. However, despite this development, the Kenyan microfinance sector still struggles with low asset quality, recording the highest non-performing loan levels in sub-Saharan Africa and third globally after Ghana and Egypt (Africa Competitiveness Report, 2015).

The institutions have attempted to improve loan performance by increasing financial literacy among creditors and by enhancing the application of monetary policy; steps which were noted to work efficiently in other countries but the level of creditor education in the country is still too low (Central Bank of Kenya, 2016). As a result, credit extension efforts remain primarily constrained.

1.3 Statement of the Problem

Microfinance usage in Kenya is declining as digital lending platforms continue to rise, as reported by Financial Sector Deepening (2019), where consumers reported declining usage of MFI services compared to digital lending; MFI usage is reported to have attained a compounded annual growth rate of just 7.8% between 2006 and 2016 – from 1.7% usage in 2006 to 3.6 usage in 2016, before declining back to its 2006 level in 2019. In contrast, usage of digital lending platforms increased from 0.6% in 2016 to 8.3% in 2019, overtaking microfinance institutions within a period of just three years (Financial Sector Deepening, 2019). Dwindling demand due to increasing competition from other lenders has constrained growth in loans and advances by MFBs. If this trend persists, it could negatively impact the long-run financial sustainability of the sector. While credit extension is partly a factor of demand, internal characteristics of the institution also have a role to play. The sustainability of the licenced microfinance banking sector has significant implications on the overall macroeconomic stability and to borrowers at the micro-level. To borrowers, licensed MFBs offer a more transparent source of financing compared to unlicensed non-bank lending institutions which operate in a regulatory vacuum - making it difficult to control their activities and ensure that Client Protection Principles for responsible financial inclusion are upheld.

Various studies have been conducted to understand the relationship between firm-level characteristics and lending behaviour (credit extension) of financial institutions – mostly commercial banks. For instance, in Nigeria, Olokoyo (2011) identified interest rates, deposit mobilization, level of domestic and foreign investment, liquidity, and the central bank policy rate as some of the determinants of bank lending. While these insights highlight how these factors affect lending growth of financial institutions in general, the study focused on listed commercial banks which operate within different bounds compared to Microfinance Banks

– for example, a more significant deposit mobilisation ability and different capitalisation requirements. There may be instances where the sensitivity of microfinance lending to their specific characteristics differ with commercial banks.

In Kenya, most studies on MFIs have focused on financial performance, loan performance and growth. Hermes and Hudon (2018) identified size, age, type of organization, and macroeconomic factors influence the performance of Kenyan MFIs, while Abdulai and Tewari (2017) studied microfinance outreach and found that portfolio risk, interest rate, asset quality, and the number of clients served affected the microfinance outreach in Sub-Saharan Africa. To date, there have been no studies on the interaction between firm-specific financial characteristics and the growth of loans and advances, which would offer insights on the lending behaviour of microfinance banks and identify bottlenecks. This proposed study solved this gap by examining the effect of firm-level financial characteristics on credit extension by microfinance banks in Kenya.

1.4 Objectives of the Study

The main objective of this study was to examine the relationship between firm-level financial characteristics and credit extension by licensed microfinance banks in Kenya.

1.4.1 Specific Objectives

i. To determine the effect of firm size on credit extension by licensed microfinance banks in Kenya
ii. To establish the effect of liquidity on credit extension by licensed microfinance banks in Kenya
iii. To determine the effect of non-performing loans on credit extension by licensed microfinance banks in Kenya
iv. To establish the effect of interest rate on credit extension by licensed microfinance banks in Kenya

To establish the effect of deposits on credit extension by licensed microfinance banks in Kenya

1.4.2 Research Questions

i. What is the effect of firm size on credit extension by licensed microfinance banks in Kenya?
ii. What is the effect of liquidity on credit extension by licensed microfinance banks in Kenya?
iii. What is the effect of non-performing loans on credit extension by licensed microfinance banks in Kenya?
iv. What is the effect of interest rate on credit extension by licensed microfinance banks in Kenya?
v. What is the effect of deposits on credit extension by licensed microfinance banks in Kenya?

1.5 Scope of the Study

The study was geographically focussed on the registered microfinance banks operating in Kenya. The contextual scope of the study sought to establish the effect of firm-level financial characteristics on credit extension by licensed microfinance banks in Kenya. The theoretical scope of the study included the liquidity preference theory, credit rationing theory, and loanable fund's theory. The methodological scope of this study was a quantitative approach with the unit of analysis being the licensed microfinance banks in Kenya. The time scope of the study reviewed panel data on the study variables for the period 2011-2018.

1.6 Significance of the Study

The results of this study are expected to be beneficial and timely to various stakeholders within the microfinance banks industry. To the management, the findings will be critical in identifying the vital firm factors that are key to their credit extension services and how best to manage lending. As a rapidly evolving industry, the results of this study will be valuable to policymakers at the Central Bank of Kenya as the findings can provide useful information that can be part of the basis of discussions related to reviewing and coming up with new regulations to support growth of the microfinance industry. The findings can also be essential to future investors within the microfinance banks as the results can offer insights into the soundness of the institutions. The results of this research are further expected to add to the

body of existing empirical evidence; thus act as reference material for future research work in the industry.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter was critical towards the examination of the various literature concerned with the variables of the study. The chapter presented the theoretical literature, the empirical studies, the summary of research gaps, and the conceptual framework as well as the operationalization of study variables, which formed the basis of the study.

2.2 Theoretical Review

A theoretical framework is made up of empirically proven and tested theories that are to support and direct a study (Swanson, 2013). This study utilized the liquidity preference theory, credit rationing theory, and the loanable fund's theory, as discussed below.

2.2.1 Liquidity Preference Theory

The Liquidity Preference Theory (within the General Theory) was developed by John Maynard Keynes in 1936 initially as the theory of interest – defining interest as the price of parting with liquidity, which was later on developed to explain other phenomena such as market pricing, risk premium setting, securities pricing, among others (Bibow, 2001). According to this theory, preference for liquidity is driven by three main motives; speculation, as a motive drives preference for liquidity as owners of the liquid asset, can take advantage of opportunities to make a profit when they arise unexpectedly; transaction motive notes that holders of liquid asset prefer to hold on to liquidity to meet daily transaction needs. Precautionary motive assumes that owners of liquid asset prefer to hold on to liquidity to cater for unexpected events or unforeseen expenditure (De Carvalho, 1995).

Larsen (1951) adopted Keynes' liquidity preference theory to explain banks' liquidity preference, by institutionalising the theory instead of looking at it at the household level. According to Larsen (1951), banks' liquidity preference is driven by both short-term and long term expectations. The resultant interest rate charged on loans is a factor of these expectations on future prices of bonds, which is part of the speculative motive of holding on to liquid assets (cash). As bond prices are inversely related to interest rates, when the price of bonds

goes up, the interest rates will fall; thus investors will buy bonds when interest rates are expected to fall, and hold them speculatively to sell in future when bond prices rise, and vice-versa. These motives for holding on to liquid assets, therefore, affect the volume of money circulating in a financial system and hence the number of loanable funds available as well as the interest rate which is determined as the price at the equilibrium of money demand and money supply (Itimu & Abdul, 2018).

Microfinance institutions as intermediaries of a financial system are affected by the liquidity preference theory insofar as it explains the setting of interest rates and the availability of loanable funds. Specifically, a microfinance institution's liquidity preferences will not accommodate the demand for credit indifferently but will compare expected returns and liquidity premier of all purchasable assets (Bibow, 2006). This theory was essential in examining how liquidity affects a microfinance banks; capacity to extend credit, as well as the setting of interest rates.

Critiques of this theory focus on the fundamental deficiencies of the theory as it relates to the setting of interest rates and the concept of non-neutrality of money. Bertocco & Kalajzic (2014) note that, while the theory is reliant on the concept of uncertainty which contributes to the expectation of future yield from assets (store of wealth), it does not define the significance of the level of uncertainty and whether different perceptions of uncertainty have varying impact on the expectation of future yield. Another critique of the theory was that it ignores the fact that banks can widen the supply of money without relying on a central bank, through the concept of credit creation; this stems from the theory's fundamental assumption that those who need credit turn to owners of capital who lend their liquid balances at a premium (interest) and this amount is finite, which is untrue as wealth owners can gain additional liquidity by borrowing from banks through credit creation (Bertocco & Kalajzic, 2014).

2.2.2 Loanable Funds Theory

A product of the studies by Robertson (1963), the loanable funds' doctrine is a theory of the market interest rate. It views interest rate as a result of the demand for and supply of capital in the economy at the level of equilibrium where both are equal (Snippe, 1985). This means that it is a standard demand-supply theory as applied to the market for loanable funds (credit),

treating interest rate as the price (per unit time) of these funds (Lindner F. , 2013). The weakness of this theory is that it assumes that the market competition is perfect and that each borrower and lender benefit from the credit received and one and only one real rate of interest prevails in the market at any time.

The theory also postulates that the volume of loanable funds is limited within the bounds of the volume of savings within the same period, thus necessitating limiting of consumption to grow the credit market (Lindner F. , 2013). This view has been criticised as it ignores lenders credit creation abilities which occur when a lender increases its loan assets and at the same time increases its liabilities (deposits) (Lindner F. , 2013). Besides, savings do not always automatically transmit into the loanable funds market as they may be hoarded by the savers or kept out of the formal financial system, while on the other hand banks can increase the volume of savings by inducing forced saving in the form of cash collateral for loans or minimum deposit balances, which would be expected to lower interest rates unless the loanable fund's mechanism is artificially obstructed by government monetary policy (Bibow, 2001).

According to Bibow (2001), the loanable fund's theory is not entirely watertight as it ignores the fact that when thrift (higher savings) at the household level increases (and hence a decrease in consumption) firms in the market face economic downturn and would turn to the loanable funds market for loans, thus an increase in loanable funds is matched by an increase in demand for loans. The fundamental assumption that an increase in savings directly and immediately lowers interest rates was thus debunked by various economists, including Keynes in his general theory which later on posited that interest rates determination does not directly rely on productivity and thrift (Bibow, 2001).

The theory offers a theoretical basis for understanding the relationship between savings and investments and loanable funds, and magnifies the role of deposit mobilization in microfinance banks. Specifically, it highlights how Microfinance Banks act as intermediaries in the financial ecosystem – mobilizing savings and allocating resources demanders of loanable funds (househods, government and businesses) through lending- at a price determined by the equilibrium of the demand curve (savings and investments) and the supply curve (loans) (Matete, Ndede, & Jagongo, 2014).

However, interest rate determination in microfinance banks is not as straight forward as it involves pricing in the high cost of monitoring and screening as well as the risk premium of serving high-risk borrowers (Dullien, 2009).

2.2.3 Credit Rationing Theory

Credit rationing is said to occur when lenders supply loans below the level of demand at a set interest rate (Jaffee & Russel, 1976). In normal market conditions, this excess demand would put upward pressure on the price hence increase interest rates. According to this theory, borrowers are categorized as either honest or dishonest, noting that honest borrowers never default. In contrast, dishonest borrowers weigh their utility and default if they consider their utility to be higher from defaulting. Therefore, lenders include a premium to cater for the default risk of dishonest borrowers which is passed on to honest borrowers (Baltensperger & Devinney, Credit Rationing Theory: A survey and Synthesis , 1985).

Put forward by Stiglitz and Weiss (1981), the Credit rationing theory is grounded on credit markets, which are characterized by uneven distribution and access to information. This lack of access to borrower information has impacted performance of MFIs in the region negatively. This is because the companies are unable to get adequate information on borrower's credit history and current transactions, this limiting their ability to plan for loan defaulters. The theory assumes that most banks capitalize and generate profits through fixed interest rates and collateral demanded from defaulters. This reduces the probability of dealing with possible defaulters and ensures that they carry out business with those individuals who will engage in income-generating projects (Banerjee, 2008).

Banerjee (2008) posits that financial institutions become competitive by setting interest rates and using the rates as a way to profile their prospective clients thus avoiding bad risks. Borrowers are assumed to prefer fixed loans which allows them to finance projects that they presume to have similar value. In such scenarios, high-risk borrowers will pay high-interest rates. In imperfect credit markets whose main characteristic is information asymmetry, the interest rate does not play the market-clearing role of balancing demand and supply. This forces banks to adopt credit rationing which uses non-price mechanisms to maximize their expected profits (Jaffee & Stiglitz, 1990).

The credit rationing theory has two main assumptions; that creditors are unable to differentiate between different classes of borrowers, and that loan contracts are subject to limited liability, i.e., if the borrower fails to generate the amount that was anticipated when taking the loan, they are not obligated to pay out of pocket. The analysis restricts itself to involuntary default, i.e., it assumes that if the borrowers could pay they would pay their outstanding loans (Banerjee, 2008).

Critics of the theory point to inconsistencies in theory around the rationality of credit rationing and what it means for profit-maximizing banks (Samuelson, 1952). Besides, the theory is criticized for overlooking other non-price factors that contribute to credit rationings such as debt ceilings and interest rate ceilings.

In traditional finance, the theory provides a background against which the basics of the lender-borrower relationship exist and the role of credit rationing in filtering creditworthy borrowers from non-credit worthy borrowers (typically the focus of Microfinance lenders (Malhotra, 2014)). The credit rationing theory therefore provides useful theoretical context to understand the lending/credit allocation decision of financial intermediaries such as Microfinance Banks (Baltensperger & Devinney, Credit Rationing Theory: A Survey and Synthesis , 1985).

According to Kimutai & Ambrose (2013), lenders' credit rationing decisions are driven by various factors including borrower characteristics that determine their credit quality, loan characteristics that affect the profitability and risk profile of each loan, and competing investment opportunities. In relation to the microfinance industry, microfinance banks typically operate in a market characterised by imperfections and significant government interventions to support microfinance activity, the theory is inconsistent with various aspects of microfinance such as the focus on entrepreneurship, the significant role of social capital, enforcement limitations, lack of information on borrowers and the subsequent implication of increased monitoring – and how this affects pricing (Malhotra, 2014).

2.3 Empirical Review

2.3.1 Firm Size and Microfinance Bank Credit Extension

The size of a Microfinance bank has implications on its financial perofrmance – including its ability to lend – as a larger size allows the MFB to capitalize on economies of scale (Mwangi, 2015). In his study on firm size impact on MFB profitability, Mwangi (2015) found that a MFB's size is positively but insignificantly related to profitability, and recommended that banks focus in asset quality as opposed to increasing asset size without focusing on quality as this can be detrimental to profitability.

Kipesha (2013) investigated the relationship between age, size and financial performance of MFIs in Tanzania, utilising panel data for 30 MFIs in a period of 5 years, and found that firm size (total assets) was positively correlated with financial performance as it enabled the MFIs to maximize its lending by increasing outreach through wider branch networks, and gaining access t larger pools of capital for lending.

Liñares-Zegarra and Wilson (2018) examined how firm size relates to growth among MFIs. The study utilized dynamic panel data drawn from a worldwide sample of 148 microfinance institutions in 120 countries over the period of 2000 to 2014, using logistic regression analysis. Findings showed that growth of the MFIs varied with the size of the institution and the ownership. The findings further indicated that the age of the microfinance firm, level of bad debt, regulation, and efficiency is crucial to growth. The findings provide useful insights on the influences of growth of MFIs and served as a source of empirical evidence to study how firm size impacts credit extension as this is part of an institution's growth representing growth in assets, and more specifically focusing on microfinance banks in Kenya.

Tehulu (2013) assessed the determinants of the financial sustainability of MFIs in East Africa. The study utilized unbalance panel data drawn from 23 microfinance institutions in East Africa for the period 2004-2009. The study relied on regression analysis, using five independent variables which included, management inefficiency, Firm size (as measured by total assets), leverage, portfolio at risk and outreach as viewed by a total number of borrowers. There was the existence of a positive and significant relationship between sustainability and total loans and identified a study on the determinants of lending behaviour or credit extension as an area of further research as credit extension (lending behaviour) is a significant driver of financial sustainability.

Ng'ang' a (2016) assessed the effect of firm size on the efficiency of Kenyan microfinance banks. Adopting a descriptive research design, the study utilized panel data collected from nine microfinance banks operating between 2011 and 2015. The findings indicate that bank size, the liquidity, and capital adequacy were insignificant predictors of bank efficiency. In another local study, Salim (2012) examined the connection between the size and profitability among Kenyan banks. Findings revealed that size had a positive effect on bank profitability levels. Mehrjardi (2014) similarly found out that there existed a positive link between profitability, deposit liabilities, customer base, number of branches, and market share in commercial banks.

2.3.2 Liquidity and Microfinance Bank Credit Extension

Aigheyisi (2015) examined factors determining loans and advances extended by Nigerian microfinance banks, seeking to define the relationship between loans and advances. The independent variables were deposits, shareholder funds, liquidity ratio and inflation. The study relied on panel data collected for the period 1992-2013 and applied quantitative analysis using regression. Findings show that inflation and liquidity ratio reduce the number of approved loans and advances extended by the MFBs, and proposed that the central bank take a cautious approach to impose a liquidity ratio to avoid constraining MFBs in their credit extension activities. While useful insights can be drawn from this study, the study focused on a specific geographical scope that is different from the proposed scope of this study.

Akani and Onyema (2017) conducted a multi-dimensional analysis of the determinants of credit growth in Nigeria. The study relied on panel data collected for the period 1981-2016 with unit root tests, cointegration tests, and causality tests being utilized. The results indicate that the interest rate and compliance with credit policies negatively influence net domestic credit. The study further indicates that liquidity and foreign direct investment have a positive effect on domestic credit. The study focused on national level net credit in Nigeria, which included both commercial banks and non-bank lenders such as MFBs. This proposed study utilized the findings from Akani and Onyema (2017) to form an initial understanding of the factors that influence credit extension at a gross level considering all types of lenders but paying attention to nuances that are specific to the nature of microfinance banks in Kenya.

Murerwa (2015) studied the firm-specific and industry-specific determinants of banks financial performance in developing countries, with a focus on Kenyan commercial banks. The study applied descriptive research design and collected data from all 44 commercial banks in Kenya. On firm-specific determinants, the study found that there is a positive correlation between the adequate level of bank liquidity and lending levels. Liquid asset protects firms against deposits that might require on-demand payment and thus firm liquidity minimizes risk. However, liquid assets reduce the number of funds for lending, which in turn reduces bank profitability and, in essence, growth indicating a negative relationship between liquidity and lending levels. These findings are relevant to this proposed study as commercial banks in Kenya operate on a similar model as microfinance banks in Kenya insofar as credit extension is concerned. However, differences are expected, especially on microfinance banks' sources of liquidity compared to commercial banks.

Bengi and Njenje (2016) evaluated the extent to which financial factors influenced growth among microfinance institutions in Banati Sub-County, Kenya. A descriptive research design was adopted, with the population of the study being drawn from the 20 MFIs within the area. Data was collected from the employees of these institutions and analysed using spss software using descriptive and inferential statistics. The findings indicate that higher interest rates, an increase in financial literacy, and prudential liquidity management are key to enhancing the growth of the institutions. The study focused on only two variables, financial literacy of staff and interest rates. It did not consider any other firm-specific factors that contribute to the growth of MFIs, which was addressed in this proposed study. The study also only focused on non-deposit taking MFIs while this proposed study specifically looked at deposit-taking MFBs.

2.3.3 Interest Rate and Microfinance Bank Credit Extension

High interest rates in Microfinance sector are considered a necessity for the survival of the microfinance institutions, as MFIs typically operate under constrained environment when it comes to financial resources, which forces the lenders to widen interest margins in order to maximize profitability and self-sufficiency (Al-Azzam & Parmeter, 2019).

Interest rates are associated with credit rationing decisions of lenders as they have an implication on profitability. In their study on Credit Rationing in Markets with Imperfect

Information Stiglitz & Weiss (1981) found that a low-interest rate environment leads banks to reduce their lending as they focus on managing risk and lowering potential non-performing loans from affecting their balance sheets.

High interest rates are associated with a higher level of risk of the loan book as well as pushing borrowers to use loan proceeds in high-risk opportunities in order to recover the cost by aiming for a high-risk high-return opportunity; this has been found to push MFIs to demonstrate a preference for reducing lending and increasing strictness in the credit assessment process, as opposed to increasing interest rates (Al-Azzam & Parmeter, 2019)

Kavwele, Ariemba, & Evusa (2018) explored the consequences of the interest rate capping on profitability among Kenyan banks. The study assessed 32 out of 43 commercial banks in Kenya, using a multiple linear regression model to analyse how profitability, interest and non-interest income, and interest expense were related for the pre-interest-rate capping period and the post-interest rate capping period. Conclusions were that all three independent variables had a strong positive correlation to the dependent variable, both pre and post interest rate capping, and found that financial performance was constrained during the interest rate capping period. The study did not look into whether the decline in financial performance was due to the interest rate cap only, or whether the banks shifted their investment from lending to customers investing in government bills and bonds. This proposed study investigated how the interest rate environment impacts a microfinance bank's lending behaviour in terms of credit extension volumes.

Ng'etich and Wanjau (2011) investigated the consequences of interest rate spread on NPL among Kenyan banks, adopting a descriptive research design. The 43 registered banks were samples, with questionnaires being utilized in data collection. Conclusions were that interest rate spread affect performing assets in banks since it leads to higher charges being imposed on borrowers and that interest rates negatively affect non-performance of assets, since these regulations determine the interest rate spread in banks thus reducing the growth of NPLs. The study did not consider whether interest rate spreads' influence on moral hazard also impacts the selection of clients to approve or deny loans to, and hence affect the growth in credit extension. This study sought to find out whether this relationship exists, and the extent of the relationship in the context of microfinance banks in Kenya.

2.3.4 Non-Performing Loans and Microfinance Bank Credit Extension

Non-performing loans are an indicator of credit risk in lending institutions. The interaction between non-performing loans and growth in loan assets has formed the subject of various studies. Amoako (2015) investigated the Effect of Bad Loans on the Profitability and Lending Potential of Rural Banks in the Ashanti Region and found a negative and significant relationship beween NPLs (bad loans) and the rural banks' lending potential, as an increase in NPLs reduces lending capital.

Arko (2012) conducted a cases study on Sinapi Aba Trust to determining the Causes and Impact of Non-Performing Loans on the Operations of Microfinance Institutions, and found that NPLs the cost of risk reduced loanable funds as well as the lost interest income on unpaid loans that end up as written off amounts or restructured to include a moratorium on repayment; hence reducing level of loans in the balance sheet.

Kitonyi, Sang, & Muriithi (2019) investigated the effect of NPLs on financial performance of MFIs in Kenya, and found that, as loans are the main output of an MFI's business model, the performance of these institutions depends on the performance of lending, and that the NPLs have a significant relationship with financial performance of MFBs in Kenya.

Cucinelli (2015) investigated the consequence of NPL on bank lending in Italy and found that NPL negatively impacts bank lending capability as the results indicated that credit risk (NPLs) from previous year impacted bank lending in the next year, which was interpreted as banks opting to take on less risk by reducing their lending activity and slowing down growth in the even that NPLs from the previous year were high. In a similar study on commercial banks in Kenya, Mburugu (2018) researched on the effect of NPLs on bank lending behaviour in all 41 commercial banks through regression analysis and found a negative relationship between NPLs and lending growth.

Accornero et al. (2017) investigated how NPL impacts bank lending to non-commercial firms in Italy for the period between 2008 and 2015. The study applied a fixed-effects model to control for changes in borrower characteristics. Findings indicated no causal relationship between bank lending behaviour and NPLs. However, NPLs do affect credit extension as the provisioning expense related to NPLs can cause a negative adjustment to funds available for

lending. These findings provide a strong fundamental background on how NPLs affect bank lending and provided a basis to investigate the same relationship for Microfinance Banks in Kenya.

In Nigeria, a study on internal and macroeconomic factors that affect bank lending found that NPLs did not significantly impact banks' lending behaviour during periods of macroeconomic uncertainty and contracting private sector credit, as commercial banks did not increase their lending to private sector despite declining NPLs (Yakubu, Omosola , & Obiezue , 2018). The above studies show lack of sufficient evidence to support the hypothesis that NPLs compromise banks risk appetite, thus compelling them to slow down growth by reducing lending activity. However, there is also evidence that NPLs alone do not influence lending behaviour and that in some instances, the relationship is insignificant as other factors have a higher impact.

2.3.5 Deposits and Microfinance Bank Credit Extension

Deposits are a major contributor to a lending institution's funding. They, therefore, have a significant role in the bank's lending behaviour (Qudah, 2017). Deposit volume positively affects bank lending behaviour as a higher deposit volume increases the lender's capital available to finance its loans and advances (Yakubu, Omosola , & Obiezue , 2018). In research on determinants of loans and advances extended by Microfinance Banks in Nigeria, Deposit Mobilization was identified as one of the major determinants of loans and advances as they increase the lending institution's capacity to lend (Aigheyisi, 2015).

However, as deposit mobilization was neglected by most MFIs until recent advancements in the sector, MFIs typically tend to have weaker deposit mobilization activity (Gonzales & Meyer, 2009). This research (which covered all markets globally) found that MFIs are showing progress in mobilizing micro-deposits as their analysis on average deposits per depositor in comparison to average loans per borrower found that the average deposits were much smaller than average loans. In addition to increasing capacity to lend, research has found that deposit mobilization by MFIs crowds out subsidies, therefore, increases financial self-sufficiency, reduces interest rates due to a lower funding cost thus enabling the MFI to reduce its loan pricing and stay true to its mission of reaching borrowers at the base of the pyramid (Al-Azzam M. H., 2018). While these findings are useful in understanding the role

of deposits in operational sustainability and loan pricing, it would be interesting to see how this variable affects lending volumes across different microfinance institutions with different levels of deposit volumes.

2.4 Summary of Literature and Research Gaps

The study conducted a review of several empirical studies that have focused on similar constructs adopted in this research. From this review, the study has been able to identify gaps that are key motivators to undertaking this examination. A summary of the various gaps is outlined in the table below.

Table 2.1 Summary of Research Gaps

Author	Title	Findings	Gaps identified
Akani and Onyema (2017)	Determinants of credit growth in Nigeria	The results indicate that the interest rate and compliance with credit policies negatively influence net domestic credit	The study focuses on national level net credit while the current study examines credit extension by individual MFBs in Kenya
Bengi and Njenje (2016)	Influence of financial factors on the growth of Microfinance Institutions	Higher interest rates are key to enhancing the growth of the institutions.	The study focuses on primary data while this study utilized panel data to examine how firm factors affect credit growth in MFB
Kavwele, Ariemba and Evusa (2018)	Effect of interest rate capping on the financial	Interest rate capping influenced the performance of	The study does not look into whether the interest rate cap diverted loan supply to government securities and

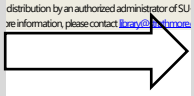
	performance of commercial banks	commercial banks in Kenya	other investments, thus constraining credit extension
Laidroo (2012)	determinants of lending growth and cyclicality of banks	The study notes that bank size has a negative association with the lending growth	The study is limited to commercial banks in Europe, while this study focuses on credit growth within MFB in Kenya.
Liñares-Zegarra and Wilson (2018)	Size and growth of microfinance institutions	Growth of the MFIs varied with the size of the institution and the ownership	The study focuses on the growth of MFI across several countries while this study was specific to the growth of credit extension by MFBs in Kenya
Salim (2012)	Size and money-wise performance of local banks in Kenya	Findings revealed that size impacted positively on the performance of commercial banks	This research sought to examine how the size of MFB institutions influence their financial lending levels
Accorneo (2017)	Effect of non-performing loans on bank lending in Italy	The study found that there was no causal relationship between NPLs and bank lending behaviour. However, there was a negative	The study focused on commercial banks in Italy while this proposed study focussed on microfinance banks in Kenya

		correlation between the two variables as NPLs reduced the funds available for lending.	
Aigheyisi (2015)	Effect of deposits on loans and advances by microfinance banks in Nigeria	Deposits are positively correlated with loans and advances by MFBs in Nigeria	The study focused specifically on Nigeria which is a different geographic scope with this proposed study which focussed on Kenya

Source: Researcher (2020)

2.5 Conceptual Framework

The conceptual framework below identifies the hypothesized link between firm-level characteristics and credit extension by licensed microfinance banks in Kenya.



Independent Variables

Firm Size (Log of Total Assets): +ve relationship

Liquidity (total current assets/total current liabilities): -ve relationship

Interest (Interest income to average loan book): +ve relationship

Deposits (Log of total deposits): +ve relationship

Non performing loans (Log of non-performing loans): -ve relationship

Dependent Variable

Microfinance banks credit extension: **Total Value of loans and advances to customers**

Figure 2.1 Conceptual Framework

The above conceptual framework depicts the interaction between the firm-level characteristics and credit extension by Microfinance Banks. The independent variables were the firm size, liquidity, interest rate, deposits and non-performing loans. The dependent variable for this study was credit extension levels by microfinance banks. The study variables were operationalized, as shown in the table below.

Table 2.2 Operationalization of Study Variables

Variable	Measures	Data Collection Tool	Data Analysis	Past relevant studies
Firm size	• Log of total assets	Data extraction 2011-2018	• Means and deviation • Correlation coefficient • Regression analysis • ANOVA tests	• Liñares-Zegarra and Wilson (2018) • Tehulu (2013) • Ng'ang' a (2016)
Liquidity	• Total Current Assets/Total current liabilities ratio	Data extraction 2011-2018	• Means and deviation • Correlation coefficient • Regression analysis • ANOVA tests	• Aigheyisi (2015) • Akani and Onyema (2017)

Variable	Measures*	Data Collection Tool	Data Analysis	Past relevant studies
Total deposits	• Log of total deposits	Data extraction 2011-2018	• Means and deviation • Correlation coefficient • Regression analysis • ANOVA tests	• Yakubu, Omosola, & Obiezue (2018) • Aigheyisi (2015)
Interest rate	• Interest income to the average loan book	Data extraction 2011-2018	• Means and deviation • Correlation coefficient • Regression analysis • ANOVA tests	• Kavwele, Ariemba, & Evusa (2018) • Ng'etich and Wanjau (2011)
NPL	• Log of non-performing loans	Data extraction 2011-2018	• Means and deviation • Correlation coefficient • Regression analysis • ANOVA tests	• Accornero et al. (2017) • Yakubu, Omosola, & Obiezue (2018)
Credit extension	• Log of total loans and	Data extraction	• Means and deviation	• Blavy, Basu, & Yulek (2004)

Variable	Measures*	Data Collection Tool	Data Analysis	Past relevant studies
	advances to customers	2011-2018	• Correlation coefficient • Regression analysis • ANOVA tests	

Source: Researcher (2020)

*All values extracted in Kenya Shillings

Influence of firm-level financial characteristics on credit extension by microfinance institutions: a case of Kenyan licensed microfinance banks

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focusses on the research methodology, which is the blueprint that assists in the solving of the research problem. It presents the research philosophy, the research design, the population of the study, the sampling, data collection instruments, procedures and the data analysis and presentation.

3.2 Research Philosophy

This study was based on the pragmatism research philosophy, which integrates multiple approaches in acquiring knowledge about a phenomenon (Baxter & Jack, 2008). Creswell and Creswell (2017) agrees and states that pragmatism allows a researcher to work within both positivist and interpretive approaches allowing for findings to be interpreted in multiple ways. The study was based on positivism paradigm which proposes hypothesis testing as a method to statistically justify a belief theory (Cooper & Schindler, 2006).

3.2.1 Research Design

This is the methodical approach applied by the researcher to answer the posed research questions (Saunders, Lewis, & Thornhill, 2009). This study utilized a descriptive research design. The descriptive research design is an in-depth attempt to determine and describe various aspects of a phenomenon, which - in this study - is how firm-level characteristics impact credit extension by microfinance banks. It formulated a multiple regression model to analyse the relationship between firm-level characteristics and credit extension by Microfinance banks in Kenya.

3.3 Population and Sampling

3.3.1 Target Population

The population is defined as elements or members of a particular group in which the research is to be conducted (Matthews & Ross, 2015). The population of this research is all the licenced microfinance banks in Kenya. There are 13 licensed Microfinance banks in Kenya

- according to (King'ori, Kioko, & Shikumo, 2017). The list of licensed MFBs is annexed in this document as Annex III. The rationale for selecting licensed microfinance banks in Kenya is because they are subjected to similar requirements as per the regulatory framework and therefore operate within similar bounds, as opposed to unlicensed MFIs which operate in a regulatory vacuum.

3.3.2 Sampling Technique and Sample Size

According to Stutley (2013), a sample size should not be smaller than 30 as it has been proven that a sample size greater than 30 produces results with a mean distribution that is similar to a normal distribution curve. Besides, Saunders, Lewis and Thornhill (2009) note that, should a population be less than 30, the recommended approach is to include all units in the sample. Thus, this study did not include a sample, but instead involved a census of all the 13 licenced MFBs in Kenya. The data was sufficient as it is a panel of data made up of both cross-sectional subjects (licenced banks) and time (in years spanning between 2011-2018).

The institutions to be observed applied stratified sampling and they were grouped into small, medium and large, as categorised by the Central Bank of Kenya, where large MFBs are those that have a market share greater than 5%, the medium is those that have a market share of between 1% to 5%, and small being those with a market share less than 1% (Central Bank of Kenya, 2018). The unit of observation was each licensed MFB in Kenya.

Table 3.1 Population of licensed Microfinance banks in Kenya

Category	Number of institutions	Percentage of total
Small	7	54%
Medium	3	23%
Large	3	23%
Total	13	

Source: Central Bank of Kenya (2018)

3.4 Data Collection Instruments

The study relied on quantitative data that was sourced from the annual reports published by CBK and the individual microfinance banks. Panel data was collected for the period 2011-2018. The period of study was chosen following the enactment of reforms in the sector which included the publication of the DT-Microfinance Regulations in 2008 (Central Bank of Kenya, 2018).

Data was collected from the financial statements (Income statement, Balance Sheet, Cash Flow statement) of all the licensed MFBs published in Central Bank of Kenya's Annual Banking Supervision Reports as well as publicly available information published by the MFBs themselves. Data collected from the secondary sources included:

Table 3.2 Types of Data

Variable	Data to be collected	Source of data	Frequency
Dependent variable: Credit Extension (Loans and advances)	The total value of loans and advances for each microfinance bank (cross-sectional) for each year in the period of study (longitudinal)	Balance sheet audited financial statement of each microfinance bank (cross-sectional) for the period of study	Annual
Independent variable: Firm size (total assets)	Total assets value for each microfinance bank (cross-sectional) for each year in the period of study (longitudinal)	Balance sheet audited financial statement of each microfinance bank for the period of study	Annual
Independent variable:	Total current assets and total	Balance sheet audited financial	Annual

Variable	Data to be collected	Source of data	Frequency
Liquidity (total current assets to total current liabilities ratio)	current liabilities for each microfinance bank (cross-sectional) for each year in the period of study (longitudinal)	statement of each microfinance bank for the period of study	
Independent variable: Total deposits	Value of total deposits for each microfinance bank (cross-sectional) for each year in the period of study (longitudinal)	The audited balance sheet of each microfinance bank for the period of study	Annual
Independent variable: Interest rate (Interest income to average loan book)	Total Interest income and the total value of loans and advances for each microfinance bank (cross-sectional) for each year in the period of study (longitudinal)	Total interest income was extracted from the audited income statements of each microfinance bank Total loans and advances were extracted from the audited balance sheet of each microfinance	Annual

Variable	Data to be collected	Source of data	Frequency
		bank for the period of study	
Independent variable: NPLs	Value of non-performing loans for each microfinance bank (cross-sectional) for each year in the period of study (longitudinal)	The audited balance sheet of each microfinance bank for the period of study	Annual

3.5 Data Collection Procedure

Research procedures are the various processes utilized in the data collection process. The study relied on secondary data sourced from the licensed microfinance banks. The researcher sought permission from the Strathmore Business school before embarking on the data extraction process. The study also ensured that all the requisite permits are sourced before collecting research data.

3.6 Tests for Linear Regression Assumptions

The study conducted the following tests for linear regression: Normality tests, test for multi-collinearity, tests for heteroskedasticity and tests for autocorrelation as described below:

3.6.1 Normality Tests

The assumption of linear regression requires that the data should be normally distributed. Normality tests are useful in determination of the shape of the dataset was modelled from a normally distributed sample and in calculation of the probability of one of the variables governing the data set to be normally distributed (Ghasemi & Zahediasl, 2012). Normally

distributed samples have a distribution which mirror the shape of the normal curve indicating normality. The Shapiro-Wilk tests were utilized.

3.6.2 Multicollinearity Tests

Multicollinearity is a result of inter-correlation among the explanatory variables. Runkle, DeFusco, Anson, Pinto, and McLeavey (2013) opine that multicollinearity is a result of high correlation among two or more predictor variables. This relationship is unacceptable since the correlation means that the effects of independent variables are inseparable (Cooper & Schindler, 2006). The variance inflation factor (VIF) is the indicator of multicollinearity. As a rule of thumb, lower levels of variance inflation factor (VIF) of less than 10 is acceptable. This study included a test for multicollinearity to confirm the reliability of the model.

3.6.3 Heteroscedasticity Tests

This study applied the Breusch–Pagan test was used to test for Heteroscedasticity in the regression model. It tests the relationship between the estimated variance of the residuals from regression and the values of the independent variables.

3.6.4 Auto-Correlation Test

Auto-correlation refers to the correlation of a time series with its past and future values (Ramakrishnan, 2013). The auto-correlation function was used to detect non-randomness in data and identify an appropriate time series model if the data is not random. Auto-correlation is a correlation coefficient, but instead of correlation being between two different variables, the correlation was between two values of the same variable at times $X_i + X_{it}$. Serial correlation was tested using the Wooldridge test.

3.7 Data Analysis and Presentation

The study coded the extracted research data into Microsoft Excel and STATA 15 for subsequent data analysis. The study employed both descriptive and inferential statistical techniques. The descriptive statistics included means, standard deviation, and coefficient of variance. The inferential statistics included the Pearson correlation and regression analysis.

A regression of each independent variable was conducted to test the individual effect of each independent variable on the dependent variable. To test the combined effect of the independent variables on the dependent variable, a panel regression estimation analysis was conducted.

As the study includes a panel of 13 licenced MFBs across eight time periods (micro-panel), the study utilized a panel regression model. As different MFBs were licenced at different years, the panel consisted of individual MFBs being observed a different number of times. The panel is therefore expected to be an unbalanced panel.

The choice between a fixed-effects model or a random-effects model was made upon running the Hausman's Specification Test. Hausman's Specification Test assumes that the preferred model is the random effects model (null hypothesis), and tests whether there is a correlation between unique errors and regressors in the model ((Ali, et al., 2016)

The general Fixed Effects Model is demonstrated in the equation below:

Equation 1: General Fixed Effects Model

$$Y_{it} = \beta_1 X_{it} + a_i + u_{it}$$

Where:

a_i (i=1…n) is the entity intercept

Y_{it} represents the dependent variable; i= entity and t = time

X_{it} represents an independent variable

β_1 represents the coefficient to the independent variable

And u_{it} represents the error term

The general Random Effects Model is demonstrated in the equation below:

Equation 2:General Random Effects Model

$$Y_{it} = a + \beta X_{it} + u_{it} + \varepsilon_{it}$$

Where Y_{it} denotes the dependent variable, i.e. credit extension by Microfinance Banks i at time t

u_{it} represents between-entity error

ε_{it} represents within-entity errors.

The model to be used in this study is demonstrated in the equation below:

$$CE_{it} = a + \beta_1 FS_{it} + \beta_2 LQ_{it} + \beta_3 IR_{it} + \beta_4 NPL_{it} + \beta_5 DP_{it} + \varepsilon_{it}$$

Equation 3: Panel Regression estimation model

Where:

i denotes the observation (Microfinance Banks) i= 1--------13

t is the period t= 2011--------2018.

CE_{it} denotes loans and advances by Microfinance Bank i at time t

a denotes entity intercept

FS_{it} denotes the firm size of Microfinance Bank i at time t

LQ_{it} denotes liquidity of Microfinance Bank i at time t

IR_{it} Interest Rate charged by Microfinance Bank i at time t

NPL_{it} Non-Performing Loans of Microfinance Bank i at time t

DP_{it} Total Deposits of Microfinance Bank i at time t

β_1- β_5 are coefficients to the independent variables

ε_{it} denotes the error term

Table 3.3 Variables Description

	Variable	Description	A priori expectation (+ or -)
Dependent Variables	Credit Extension (CE)	Total loans and advances by MFBs	
	Firm Size (FS)	Log of Total Assets	+
	Liquidity (LIQ)	Total Current Assets divided by Total Current Liabilities	-
Independent Variables (firm-level characteristics)	Interest rate (IR)	Total interest income divided by average loans and advances	+
	NPL (NPL)	Log of Total Non-Performing loans	-
	Total Deposits (DP)	Log of Total Deposits by customers	+

3.8 Research Quality

To ensure the reliability of data, the researcher only relied on data from reputable sources, primarily from the CBK, the AMI Kenya and other reputable commercial sources of data. Using multiple sources of data enabled the researcher to cross-check the data and ensure consistency. Inferential statistics were applied to test for reliability. To gain insights on the significance of the study, ANOVA testing was applied to test the adequacy of the model. T-test and F-Test were applied to determine which of the independent values have the most significant predictive power of the dependent variable. There is precedence for utilising these reliability tests as observed in Thuo (2019).

3.9 Ethical Considerations

Prior to embarking on the data collection process, approval was sought from the Ethics Committee of Strathmore University. NACOSTI, being the regulatory body was contacted for a research permit. The research also ensured that all the data pooled from the firms are treated with the utmost confidentiality. The study only utilized the research data for the stated academic purposes, and the identifiers of the individual MFB was concealed in the analysis.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents the analysis and findings of this study, in line with the objectives and research methodology. The study sought to examine the relationship between firm-level financial characteristics and credit extension by Kenyan microfinance banks.

4.2 Data Sources

Data was collected from secondary sources from submissions by the individual microfinance banks published by the Central Bank of Kenya. 13 banks were included in the study, and the period spanned 8 years – from 2011 to 2018. The number of records observed for each bank was 3, i.e. Income statement, balance sheet and cashflow statement; and the number of data points collected for each microfinance bank was 6, as per the variables, i.e. Loans and advances, total assets, liquidity ratio, total deposits, interest income and non-performing loans. As the microfinance banks were licensed at different times and therefore began operations in different years, the number of records observed varied from year to year as per the table below:

Table 4.1: Number of records

Year	Number of licensed MFBs	Number of records reviewed	Number of data points collected
2011	6	18	36
2012	8	24	48
2013	9	27	54
2014	9	27	54
2015	12	36	72
2016	13	39	78

2017	13	39	78
2018	13	39	78
Total	**13**	**249**	**498**

4.3 Descriptive Summary

This section provides detailed summary results for the study variables in terms of mean and standard deviation.

Table 4.2 Descriptive Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
Loan book (KES)	83	3,950,000,000	6,560,000,000	19,000,000	22,188,550,000
Intrate	83	26 (%)	7(%)	9%	42%
Deposits (KES)	83	2,870,000,000	5,230,000,000	14,000,000	17,891,042,000
TotalAssets (KES)	83	6,160,000,000	9,640,000,000	37,000,000	32,319,605,000
NPL (KES)	83	422,000,000	827,000,000	1,000,000	3,561,352,000
Liquidity Ratio	83	45(%)	43(%)	3%	298%

Table 4.2 provides an overview of the variables under observation.

The Dependent Variable Credit Extension was represented by the value of loans and advances in the balance sheet. This varied from institution to institution, with an observed mean of KES 3.95 billion, a minimum of KES 19 million and a maximum of KES 22.2 billion. There are a few dominant entities in the market, as two largest MFBs represented 82% of the entire sector's loan book by 2018, with the remaining 11 entities representing only 18% of the sector's lending levels. The variability can be attributed to the maturity level of each entity.

The independent variable "Interest" was represented by the blended average pricing rate on loans. Interest rates averaged 26%, with a minimum of 9% and a maximum of 42% across all the entities under observation. The interest rates were observed to increase steadily as the entities matured, as the lowest rate was observed in 2016 from an institution that had operated as a licensed MFB for only 1 year.

The Independent Variable "Deposits" was represented by the value of deposits in the balance sheet. The sector's deposit mobilization level varied significantly across entities, increasing as each entity matured. Deposits averaged KES 2.9 billion, with a minimum of KES 14 million and a maximum of KES 17.9 billion.

The Independent Variable "Firm Size" was represented by the value of Total Assets in the balance sheet. Total Assets averaged KES 6.16 billion, with a minimum of KES 77 million and a maximum of KES 32.3 billion. Total Assets grew steadily as the institutions matured over the study period, totalling 73 billion by 2018, with the top two firms taking 77% and the remaining 11 firms taking 23%. This indicates that the sector is not highly fragmented and is instead largely driven by the two largest firms.

The Independent Variable "NPLs" was represented by the value of Total Non-Performing Loans in the balance sheet. Non-performing loans averaged KES 422 million, with a minimum of KES 2 million and a maximum of KES 3.6 billion. Non-performing loans were generally high throughout the observation period and for all entities across the sector, increasing as lending activity increased.

The Independent Variable "Liquidity" was represented by the liquidity ratio in the balance sheet. Liquidity ranged between 3% and 298%, with an average of 45%. Generally, younger entities were observed to hold higher liquidity, which decreased as lending activity increased.

Variability is evident given the wide range between different entities and across all variables.

4.4 Trend Analysis

This section provides trend analysis results for the variables: loans, interest rate, deposits, total assets, NPL and liquidity.

4.4.1 Microfinance Banks Loans

The graph shows the change in credit extension by licensed microfinance banks in Kenya over the measurement period from 2011 to 2018.

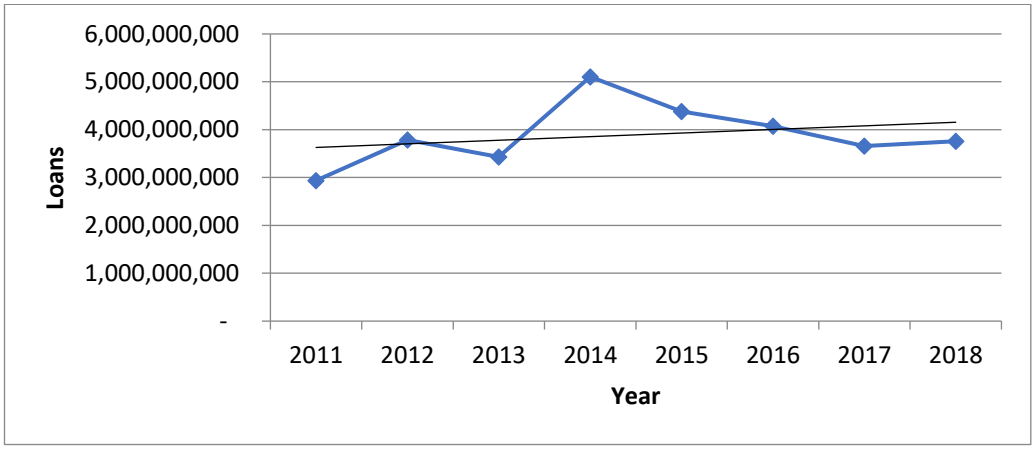

Figure 4.1 Trend on Loans

The lowest credit extension was recorded in 2011, while the highest credit extension was recorded in 2014. The trendline indicates a general increase in credit extension by MFBs over the measurement period implying that MFBs have been increasing the amount of credit to borrowers. However, slow growth is noted, as the compound annual growth rate over the period between 2011 to 2018 was only 3.59%, which is detrimental to the sector as it indicates inability of the banks to increase their customer base.

4.4.2 Microfinance Banks Interest Rate

The graph shows the change in the interest rate of licensed microfinance banks in Kenya over the measurement period from 2011 to 2018.

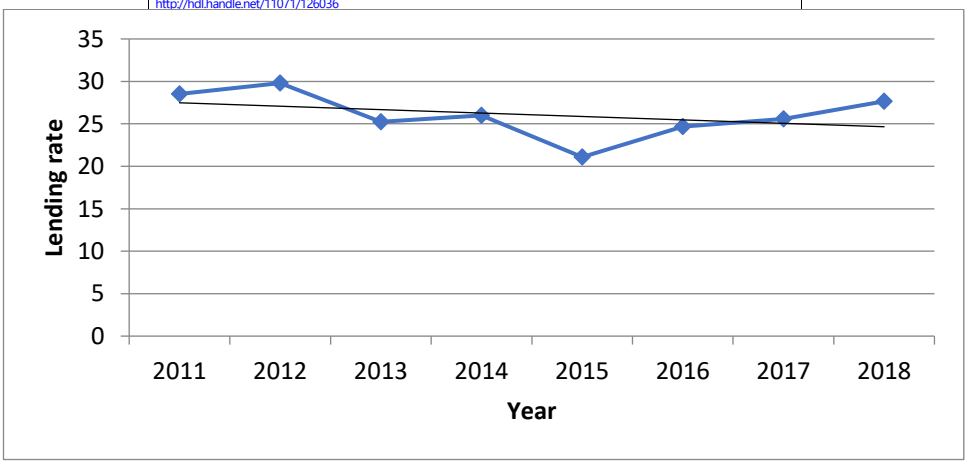

Figure 4.2 Trend on Interest rate

2015 was the lowest interest rate, with 2012 recording the highest. The trendline reveals a general decrease in interest rate over the measurement period implying that interest charged on credit has been decreasing with time. Interest rates averaged 26% over the study period, with observations indicating a high of 42% and a low of 9%. There was a steady decline between 2011 and 2015, before increasing back to 2011 levels by 2018, as competition intensified as more banks received a licence to operate as Microfinance Banks.

4.4.3 Microfinance Banks Deposits

The graph shows the variations in deposits of licensed microfinance banks in Kenya over the measurement period from 2011 to 2018.

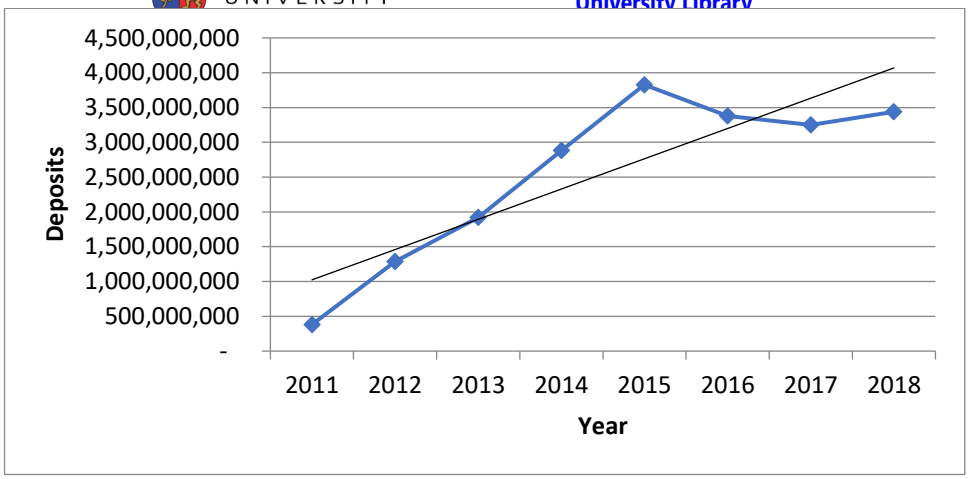

Figure 4.3 Trend on Deposits

The lowest deposits were recorded in 2011, while the highest was in 2015. The trendline illustrates a sharp increase in deposits over the measurement period implying that MFBs have been receiving more deposits from members. It is also a result of the sector gradually maturing, as more firms become licensed over the years and the older firms increased their customer base.

4.4.4 Microfinance Banks Total Assets

The graph shows the variations in total assets of licensed microfinance banks in Kenya over the measurement period from 2011 to 2018.

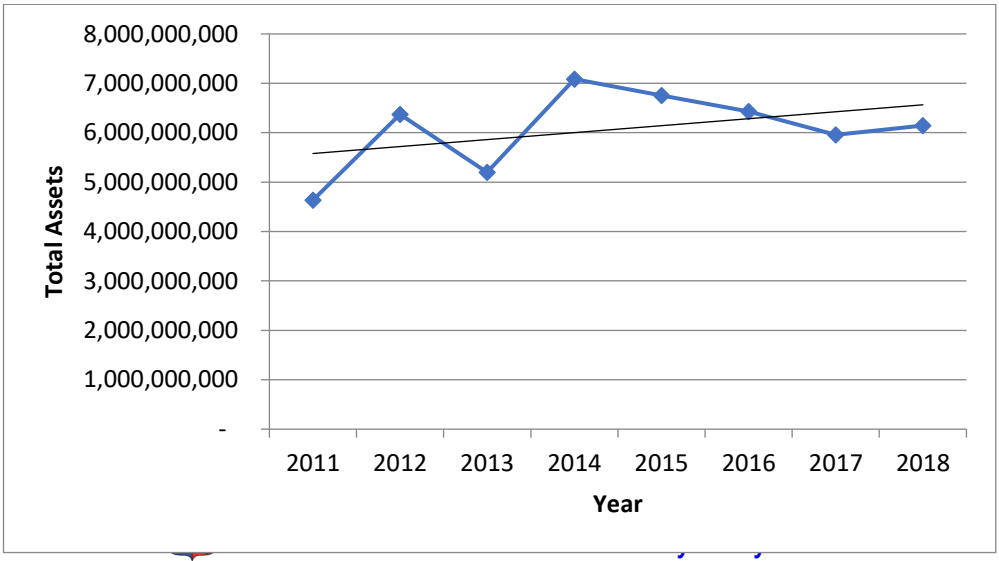

Figure 4.4 Trend on Total Assets

The lowest value of total assets was recorded in 2011, while the highest was in 2014. The trendline indicates an increase in the value of total assets across the period under study implying that MFBs have been experiencing gradual growth. An increase in total assets was largely driven by a growth of the sector as more firms became licenced over the years, and well as older firms maturing to increase their dominance in the sector. With a growing asset base, MFBs are expected to increase credit extension to members.

4.4.5 Microfinance Banks Non-Performing Loans

The graph shows the variations in NPL of licensed microfinance banks in Kenya over the measurement period from 2011 to 2018.

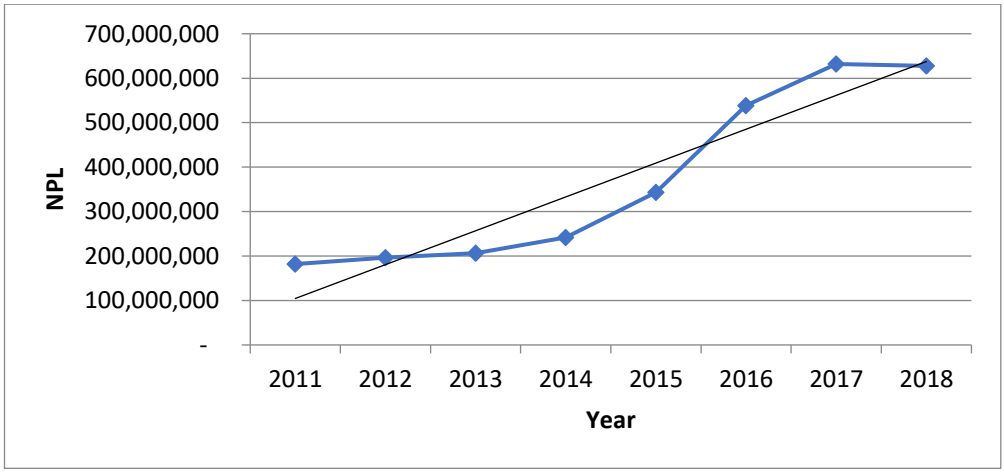

Figure 4.5 Trend on NPL

The lowest value of NPL was recorded in 2011, while the highest was in 2017. The trendline indicates a sharp increase in the amount of NPL over the measurement period implying a rise in default cases. An increase in the amount of NPL is likely to discourage MFBs from extending more credit to potential borrowers.

4.4.6 Microfinance Banks Liquidity

The graph shows the changes in the liquidity ratio of licensed microfinance banks in Kenya over the measurement period from 2011 to 2018.

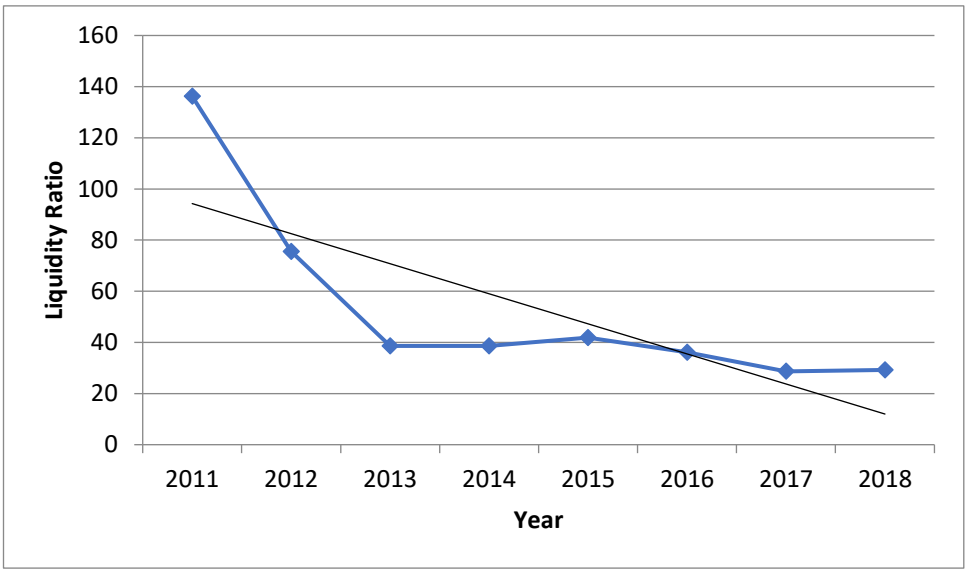

Figure 4.6 Trend on Liquidity

The lowest liquidity ratio was recorded in 2018, while the highest was in 2011. The trendline indicates a continuous decline liquidity ratio over the measurement period, but remained above the minimum statutory liquidity level of 20% throughout the period under investigation. A steady liquidity level was observed between 2013 and 2018, indicating minimal changes in the current assets and current liabilities across the sector during this period.

4.5 Linear Regression Assumptions

The following linear regression assumptions were conducted on the study data to ensure that results obtained would be accurate and reliable.

4.5.1 Normality Tests

These tests are carried out to construe the similarity of the shape of the sample distribution with that of a normal curve. The study utilized the skewness and kurtosis tests.

Table 4.3 Skewness/Kurtosis tests for Normality

				------ joint ------	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
myresiduals	73	0.0267	0.0001	15.68	**0.0004**

Results in Table 4.3 indicated chi-square prob value of 0.0004, lower than 0.05, effectively rejecting the null hypothesis of normal distribution. The data was normalized through the use of natural logarithms.

4.5.2 Multicollinearity Test

In multiple regression, the variance inflation factor (VIF) determines the level of multicollinearity.

Table 4.4 VIF test for Multicollinearity

Variable	**VIF**	**1/VIF**
TotalAssets	7.93	0.126163
Deposits	7.64	0.130925
NPL	5.33	0.187568
Intrate	1.07	0.935128
Liquidity Ratio	1.06	0.94079
Mean VIF	**4.61**	

The findings in Table 4.4 indicated an overall mean VIF of 4.61, which was less than ten and therefore, there was no multicollinearity. This implied that the independent variables were not highly correlated.

4.5.3 Heteroskedasticity Tests

Heteroscedasticity in the regression model was tested using the Breusch–Pagan test.

Table 4.5 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance
Variables: fitted values of Loans
chi2(1) = 31.76
Prob > chi2 = 0.0000

The findings in Table 4.5 indicated that the null hypothesis of the constant variance of residuals was rejected since the probability value of 0.000 was less than the critical value of 0.05. Further, the problem of heteroscedasticity was corrected by using robustness.

4.5.4 Auto-Correlation Test

The study will use the Wooldridge test for autocorrelation statistic to test for serial correlation.

Table 4.6 Wooldridge Test for Autocorrelation

H0: no first-order autocorrelation
F(1, 13) = 26.932
Prob > F = 0.0003

The results in Table 4.6 show a rejection of the null hypothesis of no autocorrelation and that residuals were autocorrelated given that the prob value of 0.0003<0.05. However, the autocorrelation problem was managed by use of the xtreg option.

4.6 Correlation Analysis

This section provides results on the correlation between interest rate, deposits, total assets, NPL, liquidity and credit extension.

Table 4.7 Correlation Matrix

	logloans	Int rate	logdeposits	logTotalAssets	Log NPL	Liquidity Ratio
Log of loans	1					
Intrate	0.111	1				
logdeposits	0.948*	0.042	1			
Log Total Assets	0.983*	0.056	0.965*	1		
logNPL	0.927*	-0.062	0.901*	0.932*	1	
Liquidity Ratio	-0.303*	-0.095	-0.358*	-0.256*	-0.289*	1

Results in Table 4.7 revealed that interest rate and credit extension had a positive but insignificant association (r=0.1113). The findings indicated that deposits and credit extension had a positive and significant association (r=0.9477*), in line with a priori expectations as deposits form part of capital for lending. Total assets and credit extension had a positive and significant association (r=0.9833*), in line with a priori expectations as a high asset size increases a lender’s ability to lend by leveraging its balance sheet. Non-performing loans and credit extension had a positive and significant association (r=0.9274*), which is in contradiction with a priori expectations; this positive relationship implies that MFB lending is not sensitive to repayment risk. Further, liquidity and credit extension had a negative and significant association (r=-0.3029*). This implies that the increasing liquidity leads to low credit extension among MFBs in Kenya.

4.7 Regression Analysis

This section provides results on the regression analysis of each independent variable against the dependent variable, to show the individual effect of each independent variable.

4.7.1 Effect of Firm Size on Credit Extension

The study pursued the effect of firm size on credit extension among Kenyan microfinance banks.

Table 4.8 Effect of Firm Size on Credit Extension

Loans	Coef.	Std. Err.	z	P>|z|
Total Assets	1.208	0.058	20.95	0.000
_cons	-5.099	1.246	-4.09	0.000
R2	0.567			
F statistic	439.01			
Prob> chi2	0.000			

Model

Credit extension= -5.099+1.208 Firm Size

Based on findings in Table 4.8, the model was significant (Prob > chi2=0.000<0.05) implying that firm size measured by total assets was a good predictor of credit extension by Kenyan microfinance banks. Further, the findings indicated that firm size positively and significantly affects credit extension by MFBs (β=1.208, p=0.000) suggesting that increasing one unit of total assets and the outcome would be an increase in credit extension by 1.208 units. The study findings support the work of Olokoyo (2011) who established that firm size was a statistically significant predictor of credit extension by lending institutions.

4.7.2 Effect of Liquidity on Credit Extension

The study aimed to establish how liquidity affects credit extension among Kenyan microfinance banks

Table 4.9 Effect of Liquidity on Credit Extension

Loans	Coef.	Std. Err.	z	P>|z|
Liquidity	-0.014	0.005	-2.97	0.003
_cons	20.375	0.678	30.03	0

R2	0.092
F statistic	8.81
Prob> chi2	0.003

Model

Credit extension= 20.375-0.014 Liquidity

Based on findings in Table 4.9, the model was significant (Prob > chi2=0.003<0.05), implying that liquidity was a good predictor of credit extension by Kenyan microfinance banks. Further, the findings indicated that liquidity negatively and significantly influenced credit extension (β= -0.014, p=0.003). This suggests that increasing a single unit in liquidity leads to a decrease in credit extension by 0.01448 units. The study findings are similar to those of Aigheyisi (2015) who established that high liquidity reduces Microfinance Banks' lending activities. However, the study findings were not in line with those of Akani and Onyema (2017), as they found that liquidity positively influences credit extension.

4.7.3 Effect of Non-Performing Loans on Credit Extension

The study assessed how non-performing loans affect credit extension by Kenyan microfinance banks.

Table 4.10 Effect of NPL on Credit Extension

Loans	Coef.	Std. Err.	z	P>|z|
NPL	0.570	0.059	9.56	0.000
_cons	10.221	1.009	10.12	0.000
R2	0.86			
F statistic	91.35			
Prob> chi2	0.000			

Model

Credit extension= 10.221+0.570 Non-Performing Loans

The findings in Table 4.10 indicated a significant model (Prob > chi2=0.000<0.05), implying that NPL was a good predictor of credit extension by Kenyan microfinance banks. Further, the findings were that NPL positively and significantly affect credit extension by MFBs (β= 0.570, p=0.000). This indicates that increasing one unit in NPL increases credit extension by 0.570 units. The study findings are in line with Cucinelli (2015) who established that NPL impacts the bank's ability to lend. Mburugu (2018) established that NPL hampers firm growth which is a factor of lending.

4.7.4 Effect of Interest Rate on Credit Extension

The study sought to determine how interest rate related to credit extension among Kenyan microfinance banks.

Table 4.11 Effect of Interest Rate on Credit Extension

Loans	Coef.	Std. Err.	z	P>|z|
Interest Rate	0.002	0.031	0.08	0.936
_cons	19.694	1.211	16.26	0
R2	0.012			
F statistic	0.01			
Prob> chi2	0.936			

The findings in Table 4.11 indicated an insignificant model (Prob > chi2=0.936>0.05), implying that the interest rate was not a good predictor of credit extension by microfinance banks in Kenya. Additionally, interest rate had a positive but insignificant effect on credit extension by MFBs (β= 0.002, p=0.936). The study findings disagreed with Ng'etich and Wanjau (2011) assertion that interest rate spread impacts funds generation from performing assets since the borrowers are affected by increased costs to acquire loans.

4.7.5 Effect of Deposits on Credit Extension

The study aimed to establish how deposits affect credit extension among Kenyan microfinance banks.

Table 4.12 Effect of Deposits on Credit Extension

Loans	Coef.	Std. Err.	z	P>|z|
Deposits	0.859	0.070	12.21	0.000
_cons	2.832	1.501	1.89	0.059
R2	0.898			
F statistic	149.01			
Prob> chi2	0.000			

Model

Credit extension= 2.831+ 0.859 Deposits

The findings in Table 4.12 show a significant model (Prob > chi2=0.000<0.05), implying that deposits were a good predictor of credit extension by Kenyan microfinance banks. Further, the findings indicated that deposits positively and significantly affect credit extension by MFBs (β= 0.859, p=0.000). The findings imply that increase a single unit in deposits would lead to an increase in credit extension by 0.859 units. This is as posited by Qudah (2017), who argued that deposits are a major contributor to a lending institution's funding and therefore have a significant role in the bank's lending behaviour. Yakubu, Omosola, and Obiezue (2018) also found deposit volume to positively affect bank lending behaviour, as a higher deposit volume increases the lender's capital available to finance its loans and advances. Aigheyisi (2015) also identified deposit mobilization as one of the major determinants of loans and advances as they increase the lending institution's capacity to lend.

4.8 Panel Regression Estimation Analysis

The section provides panel regression findings on the combined effect of firm-level characteristics on credit extension by licensed microfinance banks in Kenya.

4.8.1 Hausman Test

This test aims to determine the appropriateness of the fixed or random-effects model. It tested for the correlation between the unique errors (*ui*) and the regressors.

Table 4.13 Hausman Test of Specification

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Total assets	1.209	1.138	0.071	0.069
Liquidity Ratio	-0.003	-0.003	2.01	0.000
NPL	-0.056	-0.041	-0.015	0.011
Int. rate	-0.001	-0.000	-0.000	0.002
Deposits	-0.019	-0.005	-0.013	0.023
chi2(5)	2.42			
Prob>chi2	0.789			

Table 4.13 indicated a resultant p-value of 0.789, which was greater than the conventional p-value of 0.05 showing no correlation between the unique errors (*ui*) with the regressors, making the random-effects model appropriate.

4.8.2 Panel Regression Estimation model

Following the Hausman test results above, a random-effects regression model was conducted to examine the relationship between firm-level characteristics and credit extension by licensed microfinance banks in Kenya. The results are presented in Table 4.14.

Table 4.14 Panel Regression Estimation Model

Loans	Coef.	Std. Err.	z	P>|z|
Total assets	1.111	0.056	19.97	0.000
Liquidity Ratio	-0.003	0.001	-2.94	0.003
NPL	-0.026	0.046	-0.56	0.578
Intrate	1.91	0.004	0.01	0.996
Deposits	-0.008	0.073	-0.11	0.909
_cons	-2.331	0.792	-2.94	0.003
R2	0.987			
F statistic	238362.7			

Prob> chi2	0.000

Below is the resultant panel estimation equation:

Credit Extension = -2.331+1.111 Firm Size-0.003 Liquidity

Results in Table 4.14 indicated that firm size and liquidity are the only good estimators in the model and are likely to be a meaningful addition to the model. This is because changes in predictor values are related to changes in the response variable as their P value is less than 0.05.

Specifically, the results indicated that firm size positively and significantly affects credit extension (β=1.111, p=0.000) showing that firm size improves credit extension by MFBs, and credit extension will increase by 1.11 times for every unit increase in firm size. The study findings support the work of Alkhazaleh (2017) and Isa, Latif, Zaharum, Nasrul, & Noh, (2019), who established that there is a significant positive relationship between bank size and bank lending.

The findings also indicated that liquidity had a negative relationship with credit extension (β=-0.003) and has a significant influence on credit extension (p=0.003). This means that a unit increase in liquidity will decrease credit extension by 0.003 times. The study findings are similar to those of Aigheyisi (2015) who established liquidity ratio has negative effects on number of loans and advances extended by MFBs. Similarly, Alkhazaleh (2017) observed that liquidity is negatively and significantly related to bank lending in Jordan. However, the study findings disagreed with those of Akani and Onyema (2017), who concluded that liquidity had a positive effect on domestic credit.

Non-performing loans, interest rates and deposits were established to be weak predictors of credit extension, indicated by p values (0.578, 0.996 and 0.909)>0.05.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the research, the discussion of the results and the conclusions, as well as recommendations and suggestions on areas for further research.

5.2 Conclusion

The microfinance industry is important in the development of the Kenyan financial sector, given their high customer base and geographical reach. However, in the recent past, the sector has faced increasing competitive pressure from the larger banks, SACCOs, digital lenders and other unlicensed lenders. This has resulted in a declining share of the lending market for microfinance banks. Having identified constraints in the growth of credit extension by licensed Microfinance banks, this study investigated how firm-level characteristics relate to the level of credit extension. The study specifically examined the effect of firm size, liquidity, interest rates, deposits and non-performing loans on credit extension by Microfinance Banks.

The research was grounded on the liquidity preference theory, the loanable fund's theory and the credit rationing theory. The study employed a descriptive research design using a pragmatic approach. The subject of the research was all licenced MFBs in Kenya with panel data collected for the period between 2011 to 2018. The study utilized descriptive analysis, inferential analysis and panel regression to determine the relationship between the study variables. A 5% significance level of the research model was obtained. Findings of the study indicate that within the study period the lowest credit extension was in 2011 which can be attributed to the nascent nature of most MFBs at the time while highest credit extension was achieved in the year 2014. Findings revealed that firm-level characteristics had varying levels of significance in their relationship with credit extension by microfinance banks in Kenya.

5.2.1 Effect of firm size on credit extension by Kenyan MFBs

Firm size, represented by total assets of a microfinance bank, is a useful indicator of the balance sheet health of a financial institution. Firm size supports the growth ambitions of a microfinance institution and the microfinance sector in general. Licenced microfinance banks recorded an annual asset base of above KES 5 billion between 2012 to 2018, and the study

identified slow growth of firm size during the study period, as the sector attained a compounded annual growth rate of 4.1% through the study period. Slow growth in firm size constrains credit extension as it limits ability of the financial institution to leverage its asset base and raise additional debt funding for on-lending without compromising its capital adequacy ratio.

The study findings demonstrated that firm size is significantly and positively correlated to the level of credit extension by microfinance banks in Kenya, in addition to being a good estimator of credit extension as demonstrated in the Panel Regression Estimation Model. These results support earlier literature by Salim (2012) who indicated that bank size positively affected its performance while Ng'ang' a (2016) notes there is a positive effect of size on the efficiency levels of microfinance banks.

5.2.2 Effect of liquidity on credit extension by Kenyan MFBs

The research examined the association between liquidity levels and credit extension within the microfinance banks. Liquidity levels were observed to decline through the study period, as lending activity increased modestly as the industry matured. The regulatory liquidity level in the industry is 20%, and the microfinance banks recorded an average liquidity level of 45%.

The study found out that the liquidity levels within the MFBs had a negative but insignificant association with the credit extension levels. This implies that high liquidity levels are associated with low credit extension levels as the institutions hold on to higher short-term assets (cash) and marketable securities, and hold lower levels of current liabilities such as deposits.

The study findings are consistent with Aigheyisi (2015), who found out that liquidity levels negatively affected the loan advances by Microfinance banks. Murerwa (2015) also established that bank liquidity was positively related to the level of lending in commercial entities. Bengi and Njenje (2016) also concluded that proper liquidity management can lead to positive growth within microfinance institutions. The results contradict Akani and Onyema (2017), who noted that liquidity had a positive effect on the growth of domestic credit at a national level.

5.2.3 Effect of non-performing loans on credit extension by Kenyan MFBs

The study investigated the effect of non-performing loans on credit extension within the MFB industry. Non-performing loans result in a cost of risk which reduces the MFB's operating profits. NPLs are also an indicator of the quality of the microfinance institution's balance sheet, where high NPLs indicate low quality assets and low NPLs indicate high quality assets.

Results indicate that MF-banks have been experiencing a sharp increase in the level of non-performing loans from a low of KES 181million in 2011 to over KES 600million shillings in 2017 and 2018. This can be attributed to the growth in credit extension levels, as well as changes in national macroeconomic environment.

The study established that the level of non-performing loans had a negative but insignificant association with credit extension levels as demonstrated in the panel regression estimation model, but not a good estimator of credit extension given the high alpha. This can be interpreted to mean that, while an increase in NPLs reduces the microfinance institution's lending levels, the effect is does not significantly reduce the MFB's willingness to lend to its target market. This is consistent with the risk appetite of microfinance institutions and the characteristics of the client group they seek to bank, which is typically of a higher risk nature than the typical clientele of commercial banks. Yakubu, Omosola and Obiezue (2018) found an insignificant effect of NPL on the lending behaviour of banks to the private sector. The findings go further to contradict Cucinelli (2015), who observed a negative relationship between NPL loans and bank lending levels in subsequent years. Mburugu (2018) also established that NPL negatively impacts a bank's lending capacity and sustainability levels.

5.2.4 Effect of interest rates on credit extension by Kenyan MFBs

Findings indicate that the general interest rates have been decreasing within the study period. The results show the lowest interest rate in the year 2015 within the microfinance firms. The changes in interest rates can be attributed to individual institution's lending decisions and regulatory benchmarks.

The study found that interest rate had a positive and significant association with credit extension within microfinance banks, which is consistent with findings by Njoroge (2017), but was found to be a weak estimator of credit extension given the high alpha. Contrary to the above findings Kavwele, Ariemba and Evusa (2018) established that interest rates improve bank productivity but fails to determine their effect on the lending levels.

The findings indicates that pricing level is not likely to influence the lending decision given that microfinance banks typically serve an underserved population who have limited options, thus the lenders have pricing power.

5.2.5 Effect of deposits on credit extension by Kenyan MFBs

A trend analysis of the data indicates that generally, microfinance banks have been witnessing an increasing level of deposits; an indicator of increased deposit mobilization within the institutions and improvement in savings culture and membership.

The results of the study established that the deposit level within microfinance institutions had a negative but insignificant relationship with the credit extension, and was found to be a weak predictor of lending as per the panel regression estimation model. This is in contradiction with Al-Azzam, (2018) who established that deposit mobilization was positively associated with improved lending within microfinance banks. Yakubu, Omosola and Obiezue (2018) result also indicated that the volume of deposits within banks was a significant predictor of the level of loans and advances offered in the institutions.

Given the customers of microfinance banks are typically economically disadvantaged individuals, their ability to save is low as they typically have low surplus income. Thius, MFBs are not likely to rely on deposit mobilisation as a source of short term cheap capital for on-lending. This explains why the variable was found to be a weak predictor of lending.

5.3 Recommendations

5.3.1 Industry recommendations

Microfinance Banks in Kenya should focus their efforts on growing firm size by maintaining the asset quality of their loan books as this has been found to have a significant relationship with growth in credit extension.

In relation to firm size, a microfinance bank's asset size affects its ability to diversify its credit extension and limit credit concentration risk. In order to grow firm size, microfinance banks should aim to maintain high asset quality of their loan book as it has an implication on the institution's ability to absorb the impact of risk, and hence affects the institution's ability to target credit extension growth.

Given the findings that deposit mobilisation is not a good predictor of credit extension, Microfinance banks should focus on mobilising capital from diversified sources, including low cost funding from microfinance developmental funding institutions, as they are not able to rely on deposits as a cheap source of funding. However, as competition in the sector heightens, microfinance banks must be willing and able to offer competitive deposit rates in order to retain sticky deposits such as term deposits and maintain stability in the level of deposits in its capital structure. This also speaks to the importance of growing market share for the Microfinance banking industry, which can be done by improving customer experience in order to reduce attrition of repeat customers to other lenders such as commercial banks.

Given that liquidity has a negative relationship with credit extension, microfinance banks should avoid holding excess liquidity as it indicates risk aversion, yet risk-taking is necessary for microfinance banks to make loans (credit extension) and make a return on capital.

While interest rates have been found to have a positive and significant effect on lending, it has also been observed that microfinance banks' lending rates are not a good predictor of credit extension. This means that lenders could continue to price loans to maximize profitability without affecting lending levels. However, care should be taken to avoid overly expensive loans as observed in the trend analysis over the study period were high, with some institutions going as high as 42%. This is because it is important for Microfinance Banks to aim to observe fair lending practices and minimize their lending rate to observe Client Protection Principles which discourage charging excessive interest rates to borrowers.

The study recommends that Microfinance banks should implement strong credit risk management policies even though NPLs have been found to have a negative and insignificant effect on credit extension, as excessive risk-taking behaviour can have drastic implications on the financial health of the business should the risk materialise.

5.3.2 Regulatory recommendations

The study recommends that the regulator should institute measures to control loan pricing by microfinance banks to discourage charging of excessive interest rates by microfinance banks which were observed to go as high as 42% over the study period. This is because high interest rates will further worsen the plight of low-income borrowers who form a significant portion of microfinance banks' customers.

Microfinance banks are expected to witness a decline in liquidity as the level of loan repayments may be affected by the implications of COVID-19; specifically, COVID-19 is expected to negatively affect the financial position of microfinance banks' customers, which will drive borrowers to delay or default on their repayment of loans from the Microfinance banks so as to cater to their immediate financing needs. A decline in repayments will reduce cash (part of short term assets) thus reduce liquidity. The regulator should therefore closely watch the overall liquidity levels of the MFBs to ensure they don't fall below the minimum statutory level of 20%, and consider supporting MFBs to access short-term COVID-19 relief funding to boost their cash positions and support lending.

5.4 Limitations of the study

One limitation to the study is that the study only focused on the effect of internal factors on credit extension by microfinance banks, but it is evident that there are other factors at play, including macro-economic factors and market dynamics such as market structure and competition. Secondly, the study only incorporated secondary data, which is a limitation because primary data from qualitative and quantitative sources can provide information to reinforce the observations and provide a more robust understanding of the sector.

5.5 Suggestion for Further Research

The research was able to identify how various firm-level factors are critical to improving credit extension within MFBs. Areas of further research can include a study on the impact of COVID-19 on these relationships to test how Microfinance banks respond to a macro-economic shock of this magnitude. It would also be interesting to investigate the impact of external competition and the rapid rise of digital finance on the overall growth of the Microfinance banking sector. Lastly, as this study focused on internal factors and how they affect credit extension, another study could be conducted to investigate the effect of macro-economic factors on credit extension by microfinance banks in Kenya.

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Influence of firm-level financial characteristics on credit extension by microfinance institutions: a case of Kenyan licensed microfinance banks

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APPENDICES

Appendix I: Data Extraction Form

Year	2011	2012	2013	2014	2015	2016	2017	2018
Firm Size								
Liquidity								
Deposits								
NPLs								
Interest Rate								
Loan book value								

Appendix II: Descripitve Summary

	Year	N	Mean	Std. Deviation
Loans	2011	5	2,937,262,400	4,816,663,301
	2012	5	3,784,882,800	5,456,901,272
	2013	8	3,433,803,375	5,344,841,903
	2014	8	5,105,310,375	7,371,548,312
	2015	11	4,381,361,455	7,673,097,464
	2016	12	4,073,294,083	7,644,822,810
	2017	12	3,658,636,583	6,870,871,315
	2018	12	3,759,903,667	6,964,676,730
	Total	**73**	**3,945,486,356**	**6,560,115,185**
Int. rate	2011	5	28.52	2.6176
	2012	5	29.8	3.6332
	2013	8	25.25	4.7734
	2014	8	26	4.5356
	2015	11	21.091	9.7719
	2016	12	24.683	8.4231
	2017	12	25.583	7.4524
	2018	12	27.642	7.9849
	Total	**73**	**25.596**	**7.3107**
Deposits	2011	5	380,835,000	461,675,953
	2012	5	1,287,835,000	1,328,685,277
	2013	8	1,922,429,750	2,705,345,826
	2014	8	2,883,126,625	4,272,353,630
	2015	11	3,826,879,636	6,524,511,920
	2016	12	3,380,058,167	6,313,541,595
	2017	12	3,250,052,750	6,026,741,257
	2018	12	3,439,545,000	6,395,495,232
	Total	73	2,872,867,781	5,230,840,733
Total Assets	2011	5	4,636,472,200	7,238,153,388
	2012	5	6,371,822,800	8,330,286,719

	2013	8	5,202,439,125	7,736,731,920
	2014	8	7,085,326,125	9,820,058,328
	2015	11	6,753,366,909	11,271,652,292
	2016	12	6,430,386,417	11,313,749,216
	2017	12	5,955,660,167	10,228,538,149
	2018	12	6,145,633,917	10,649,234,882
	Total	**73**	**6,164,531,493**	**9,638,804,951**
NPL	2011	5	181,943,800	303,963,339
	2012	5	196,625,000	314,532,582
	2013	8	206,165,375	337,192,543
	2014	8	241,727,875	327,348,185
	2015	11	343,335,727	701,392,820
	2016	12	538,805,917	1,055,186,571
	2017	12	631,946,000	1,138,219,224
	2018	12	627,678,917	1,088,006,175
	Total	**73**	**422,381,548**	**826,588,012**
Liquidity Ratio	2011	5	136.2	111.073
	2012	5	75.6	42.945
	2013	8	38.63	18.228
	2014	8	38.63	20.29
	2015	11	41.91	12.153
	2016	12	36.17	26.073
	2017	12	28.67	14.348
	2018	12	29.25	17.736
	Total	**73**	**44.75**	**42.614**

Appendix III: Licenced Microfinance Banks

	Institution	Date Licensed	Number of branches
1	Caritas Microfinance Bank Limited	2nd June 2015	1
2	Century Microfinance Bank Limited	17th September 2012	2
3	Choice Microfinance Bank Limited	13th May 2015	1
4	Daraja Microfinance Bank Limited	12th January 2015	12
5	Faulu Microfinance Bank Limited	21st May 2009	39
6	Kenya Women Microfinance Bank Limited	31st March 2010	31
7	Rafiki Microfinance Bank Limited	14th June 2011	17
8	Remu Microfinance Bank Limited	31st December 2010	33
9	SMEP Microfinance Bank Limited	14th December 2010	7
10	Sumac Microfinance Bank Limited	29th October 2012	4
11	U & I Microfinance Bank Limited	8th April 2013	2
12	Uwezo Microfinance Bank Ltd	8th November 2010	24

13	Maisha Microfinance Bank Limited	21st May 2016	1

Influence of firm-level financial characteristics on credit extension by microfinance institutions: a case of Kenyan licensed microfinance banks

Winnie Njeri Karanja
Strathmore Business School
Strathmore University

Appendix IV: NACOSTI License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **367099**

Date of Issue: **09/April/2020**

RESEARCH LICENSE

This is to Certify that Ms.. Winnie Njeri Karanja of Strathmore University, has been licensed to conduct research in Nairobi on the topic: INFLUENCE OF FIRM-LEVEL CHARACTERISTICS ON CREDIT EXTENSION BY LICENCED MICROFINANCE INSTITUTIONS IN KENYA: A CASE OF LICENSED MICROFINANCE BANKS for the period ending : 09/April/2021.

License No: **NACOSTI/P/20/4782**

367099

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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Appendix V: Ethical Review Committee

Strathmore UNIVERSITY

7th April 2020

Ms Karanja, Winnie
winnie.karanja@strathmore.edu

Dear Ms Karanja,

RE: Influence of Firm-Level Characteristics on Credit Extension by Licenced Microfinance Institutions in Kenya: A Case of Licensed Microfinance Banks

This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0767/20.** The approval period is **7th April 2020 to 6th April 2021.**

This approval is subject to compliance with the following requirements:

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

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

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
07 APR 2020
TEL: +254 (0)703 034 000
P. O. Box 59857 - 00200
NAIROBI - KENYA

Cc: Prof Fred Were,
Chairperson; SU-IERC

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