MACROECONOMIC FACTORS AND NON-PERFORMING LOANS AMONG DEPOSIT TAKING MICRO-FINANCE INSTITUTIONS IN KENYA

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR AWARD OF DEGREE OF MASTER OF BUSINESS ADMINISTRATION, UNIVERSITY OF NAIROBI.

NOVEMBER, 2020

DECLARATION

I Erick Kipkemoi Rono declare that this research project is my original work and that it has never been submitted for award of any degree in any other institution of higher learning.

Sign……………...................   Date………………………….

Erick Kipkemoi Rono

D61/77059/2015

I hereby confirm that this project was prepared and submitted to the University of Nairobi for examination by Erick Kipkemoi Rono under my supervision.

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DEDICATION

I dedicate this research project to my family members. I love you all and may God bless you. Thank you.

ACKNOWLEDGEMENT

I would like to extend my gratitude to God for good health and strength to undertake this research project.

I acknowledge the immense support and guidance accorded to me by my project supervisor Dr. Luther Otieno and the staff at the School of Business, University of Nairobi.

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I say God bless you all.

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ABBREVIATIONS AND ACRONYMS

ANOVA: "Analysis of Variance"

CBK: "Central Bank of Kenya"

CRB: "Credit Reference Bureau"

GDP: "Gross Domestic Product"

IMF: "International Monetary Fund"

KSH: Kenya Shillings

MFIs: Microfinance Institutions

MPT: "Modern Portfolio Theory"

NPA: "Non-performing Assets"

NPLs: "Non-performing Loans"

ROE: Return on Equity

ROA: Return on Asset

SACCOs: Savings and Credit Cooperatives societies

USD: United States Dollar

ABSTRACT

Lenders and borrowers play a vital role in the growth of economies by moving capital from organizations or businesses that have surplus money to entities that have shortage of funds then to customers. However, high NPLs often lead to financial crisis and ultimately failure of financial institutions. The MFIs in Kenya also suffer from challenges related to management of credit risks leading to accumulation of NPLs and agency problem between creditor and debtors. Most of literature on NPL in Kenya has not considered the role of macroeconomic variables on NPLs in MFIs. This led to the current research which sought to estimate the influence of macroeconomic variables on NPLs in Kenyan deposit taking MFIs. The study focused on the principal-agent theory, theory of information asymmetry, and modern portfolio theory. The present study was premised on descriptive survey approach. The study was a census of all the 13 licenced MFIs based on a ten (10) year period. All the data collected was secondary and quantitative. Descriptive and inferential statistics were applied in analysis of data. The findings have indicated that inflation, interest rates, and unemployment rate affect NPL negatively. In addition, exchange rate was found to have a statistically positive influence towards nonperforming loans. On other hand, GDP was reported to have an insignificant effect on NPL. The study therefore concluded that macroeconomic factors influence nonperforming loans in MFIs. It was then recommended that the central bank should consider viable ways of regulating the macroeconomic factors to ensure availability of loans on reasonable terms.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Creditors perform cardinal role in the growth of economies by moving capital from organizations or businesses that have surplus money to entities that have shortage of funds (Fukida, Dahalan, 2012). In the aftermath of financial meltdown in the world, banks adopted strict conditions in the issuance of credits and shifted their attention to improving their financial positions. The instability in the economy and reduced quest for credit resulted in low volumes of credits available in the private sector (Beaton, Myrvoda and Thompson, 2016). Importantly, the quantities of Non-Performing Loans (NPLs) have risen in companies that advance credit following crisis in the global economy. The rise in NPLs adversely impact the economy via avenues such as systems that supply credit, implementation of strict standards of underwriting loans and reduction in credit accessible in the private sector (Beaton, Myrvoda and Thompson, 2016).

The study was informed by the theories of information asymmetry, principal-agent and modern portfolio. In regard to principal-agent theory, Acharya and Naqvi (2011) argue that managers misprice the loans based on the underlying risk when financial institutions have excess liquidity. This ultimately leads to excessive lending which is based on under-estimation of the underlying risks and increments in NPLs. Based on the theory of information asymmetry Bester (2014) posits that incensements in the amounts of NPLs in banks result from moral hazards. Increment in NPLs is also due to adverse selections. The modern portfolio theory postulates that also a vector of

risks such as interest and inflation rates related to how large the loan portfolio is and who owns individual financial assets (Nzongang & Atemnkeng, 2006).

Micro Finance Institutions (MFIs) rely on social collateral to advance credit to groups and ventures where liability is jointly shared by members. The collaterals required by MFIs are integrated in policies governing lending and the incentives that enable periodic increment in the size of the loans depending on successful repayment. The capacity of groups to borrow is limited by joint liability because of factors such as provisions for commissions, interests charged on every person and penalties on defaults (Namutenda & Muturi, 2017). Scholars and persons in charge of policy making in the financial sector in Kenya have paid attention to the increasing levels of NPLs. Namutenda & Muturi (2017) observed that the Kenyan MFIs and their customers encounter problems related to the accumulation of NPLs. Recently, the government of Kenya introduced the interest cap rates which was later rescinded by the president but the influence caused on the rates on non-performing loans has not undergone much investigation. This study sought to examine whether macroeconomic factors significantly influence the changes in NPLs levels in microfinance institutions.

1.1.1 Non-performing Loans

International Monetary Fund's (2015) cited in El-Maude, Abdul-Rehman and Ibrahim (2017) define non-performing loan as a loan which payment period for the principal or interest has exceeded 90 days from the due date or which interest arrears same as interest charged for 90 days have undergone capitalization, refinancing or delays through agreement. Conceptually, what constitutes NPL varies among countries. The criteria used to determine NPLs also vary among countries and NPL is not the same in

some nations. Nevertheless, there are convergence of concepts on NPL among some states and institutions. The study is guided by the above definition of NPL by International Monetary Fund's (2015) because it fits in the Kenyan context where a loan is declared non-performing at the expiry of 90 days of default in payment of interests due or principal.

According to Kargi (2011), loan is considered an NPL upon determination that the client is not able to repay. NPLs are generally characterized by the inability of the debtor to pay the principal amount or interest accrued as contractually agreed between the creditor and the debtor (Gesu, 2014). The main metric of NPL is the NPL ratio which is the ratio of NPL to the sum of loan portfolio in a financial institution (Kroszner, 2015). The greater the NPL ratio the greater the inability of the creditor to collect loans accorded to the debtors.

1.1.2 Macroeconomic Factors

O'Sullivan and Sheffrin (2003) referred to macroeconomic factor as an occurrence (fiscal, natural or geopolitical) that influences the economic status of a country or a larger region. The factors of interest in the study are the rates of unemployment, inflation, and exchange and the Gross domestic products (GDP). According to Coyle (2014), GDP denotes the market value of goods and services measured in terms of money for a defined period of time, commonly stated per year. GDP denotes summative production in an economy that is measured as the total of gross values added from every individual or institution in a country that participates in production and provision of services. Taxes are included in the GDP. On the other hand, subsidies are deducted from the GDP. Economic growth rate is calculated in terms of

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geometric GDP growth in reference to an initial year and the final year across a specified period of time (Weil, 2008).

A continuous rise in the prices of merchandises across a specified time is referred to as inflation (Ha, Kose & Ohnsorge, 2019). Inflation is characterized by increments in the prices of merchandises and living becoming expensive. Inflation of specific commodities can also be determined. Inflation is an indicator of the rise in the cost of living across a period, commonly stated annually. The rise in inflation denotes fall in economic growth and economic meltdown.

The value of currency in a nation compared to the value of another nation's currency is referred to as the rate of exchange (O'Sullivan & Sheffrin, 2003). The rate of exchange indicates the rate at which money is converted to and from different currencies. The ratio of the interest charged on the money borrowed to the sum of the credit borrowed is called the rate of interest (Homer &Sylla, 1996). In is often expressed as a percentage. Unemployment is measured in terms of the rate of unemployment which is calculated as a ratio of the number people out of employment to the number of people in employment (Romer, 2011).

1.1.3 Non-Performing Loans and Macroeconomic Factors

NPLs have been attributed to factors ranging from macroeconomic to institution specific factors. Ahmad and Bashir (2013) argued that NPLs are influenced by the growth in GDP and changes in the rates of inflation and interest. According to Ahmad and Bashir (2013), NPL increase with the rise in the rates of inflation and declines with the fall in the rates of inflation. Nevertheless, NPLs were not influenced by variations in foreign direct investment.

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According to Hassan, Ilyas and Rehman (2015), NPLs are influenced by rate of interest and factors that are specific to the bank like risk evaluation and monitoring of creditors. Other factors include interference by political players and ineptitude of bank managers in credit management. According to Adebola, Yusoff and Dahalan (2011), NPLs rises and fall proportionately to the rise and fall of the rates of inflation. Shingjergji (2013) also attributed changes in NPLs to the rates of exchange, interest and inflation and the growth in GDP growth. NPL varies proportionally to the rate of exchange and growth in GDP. Conversely, an opposite association exists between Inflation and NPL.

1.1.4 Deposit Taking MFIs in Kenya

Kenyan government come up with Microfinance Act in the year 2006 to help in regulating all MFIs operating in the country. The deposit taking microfinance institutions are defined by Microfinance Act (2006) as "business that accept money from members of the public on current account and payment on and acceptance of cheques and on deposit repayable on demand or at the expiry of a fixed period or after notice." The Central Bank of Kenya (2019b) stated that "deposit taking MFIs employ the money held on deposit or on current account, or any part of the money, by lending, investing for the account and at the risk of the institution including the provision of short-term loans to SMEs or low income households and characterized by the use of collateral substitutes."

In relation to Section 5 of the Microfinance Act (2006) it gives the mandate of registering and licencing of deposit-taking MFIs to Central Bank of Kenya. Under the Microfinance Institutions Regulations (2008), these institutions are grouped into two

major categories namely community and nationwide microfinance institutions. Section 13 of the Microfinance Act (2006) stipulate that a deposit-taking MFI should not have operations beyond Kenya. According to Central Bank of Kenya (2019b), a deposit taking MFI that has met all the requirements for issuance of licence is duly specified "by placing a notice in the Kenya Gazette, thereby legally authorizing the applicants to commence the deposit-taking microfinance business." There were 13 registered deposit taking MFIs in Kenya in the year 2018/2019 as listed in Appendix I (Central Bank of Kenya, 2019b). The stringent regulation on deposit taking MFIs in Kenya ensures that the MFIs are financially stable and protect investor funds.

The MFIs that take deposits have a requirement of maintaining higher levels of their capital unlike the non-deposit taking institutions. This helps in ensuring that all the deposit taking MFIs have adequate resources which can assist them not to incur the risk of using deposit of their clients for capital expenditure (Tettey, 2017). The capacity of MFIs to be sustainable is anchored on the capacity to effectively manage repayment of loans i.e. "financial viability depends on microfinance institution in ensuring that their customers pay back their loans (low default of loan) and ensuring due diligent is done when loans are issued" (Aidoo & Mensah, 2018).

The MFIs that accrue large amounts of NPLs become unable to provide further credit to customers as funds that can be loaned diminish (Tettey, 2017). The liquidity of the MFIs is also measured as the increase in NPLs erodes investor confidence and lowers deposits. Equally affected is the wealth of shareholders which reduces as MFIs writes off bad debts (Tettey, 2017). Moreover, increase in NPLs renders MFIs unable to undertake private investments and improve products offered to customers as the institutions strive to offset deficits caused by MFIs (Namutenda & Muturi, 2017).

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The problem of NPLs exists among financial institutions in Kenya hampering their operational and financial efficiency (Warue, 2011).

1.2 Research Problem

Microfinance institutions in developing countries contend with low performance caused by rising amounts of NPLs (Aidoo & Mensah, 2018). High NPLs often lead to financial crisis and ultimately failure of financial institutions (Ndede and Kavoya, 2017). Research on factors influencing NPLs have focused on macroeconomic environment, financial institutions and customers. The first category of researchers attributes changes in NPL to macroeconomic variables such as GDP (Radivojevic & Jovovic, 2017), unemployment (Makri, Tsagkanos & Bellas, 2014), the rates of interest (Luyeku & Otinga, 2019), inflation (Klein, 2013) and exchange rate (Beck, 2015). The second category of studies argue that NPL is caused by institution-related factors such has staff capacity, lending policies, technology (Kamande 2017, Nasieku 2014). The third group of scholars argue that NPLs are influenced by customer related factors such as the knowledge of customer on business and financial management, income of the customers (Kariuki, 2014).

The MFIs in Kenya also suffer from challenges related to management of credit risks leading to accumulation of NPLs and agency problem between creditor and debtors Namutenda & Muturi, 2017). The problem of pending bills by the government has contributed to increments in NPLs as firms that transact business with government fail to pay back credit from MFIs and other creditors. Based on the Central Bank of Kenya (CBK) report, the year 2018 recorded 12.3% of NPLs (Mwaniki, 2018). The government of Kenya introduced interest rate caps in the year 2016. This has led to

reduction in bank lending by more than 1.2 million loan accounts and SME finance dropping by more than Sh13 billion (Odhiambo, 2019). The introduction of the interest rate cap and other macroeconomic determinants may have contributed to upsurge in NPLs.

Scholarly research on NPLs has majorly considered commercial banks (Luyeku & Otinga, 2019; Ndede & Kavoya, 2017; Onuko et al., 2015), SACCOs (Kiprotich, 2017) and mortgage firms (Onchomba, 2014). The study by Bichanya and Aseyo (2013) on microfinance institution in Kenya examined institution-specific and lender-specific contributors to NPLs. The empirical literature on NPL in Kenya has not considered the role of macroeconomic variables on NPLs in MFIs. This study sought to undertake an examination of the influence of macroeconomic variables on NPLs in Kenyan deposit taking MFIs. The question that the study seeks to answer is whether macroeconomic factors (GDP and the rates of employment, exchange and inflation) affect NPLs in deposit taking MFIs in Kenya?

1.3 Objectives of the study

To establish the influence of macroeconomic factors on non-performing loans among deposit-taking microfinance institutions in Kenya.

1.4 Value of the Study

The study came up with recommendation to steer policies directed towards strengthening control of risks associated with credit in Kenya. The information derived from the research will aid in strategic planning towards minimization of NPLs in Kenya and improvement of access to credit and financial inclusion as envisioned in

Kenya Vision 2030. This can assist legislators in regard to review of regulations on credit management in Kenya. Specifically, the debate on the nexus between macroeconomic factors NPLs.

The decision makers including board of directors and senior managers of the Kenyan MFIs can use the results and recommendations of the study to come up with strategies to reduce NPLs. The results can enable managers of the MFIs to monitor and manage NPLs. The findings will further enable the management of financial institutions to improve the systems of credit management with intention to minimise NPLs and improve financial positions.

The knowledge generated in this study is valuable to academicians with interest in credit management and specifically NPLs. The results have contributed on the foundation for academic discourse and further studies on NPLs. The results have as well informed scholarly perspectives on the ongoing debates on access to credit through prudent management of debts and NPLs in particular.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter explores the knowledge generated from studies on NPLs. The first category of literature is the theories that inform interactions between the variables of interest in the study. The second category of literature is the empirical evidence on the link between the variables in the study.

2.2 Theoretical Literature Review

The first area of review is the theories that underlies the study. The relevant theories are the information asymmetry, principal-agent and modern portfolio theories. Theories that addresses the firms' managerial behaviour, costs and ownership structure.

2.2.1 Principal-Agent Theory

The principal-agent theory was formulated by Jensen and Meckling (1976). In accordance to these scholars, the theory of principal-agent is premised on a contractual engagement in which an individual or a group of people enters into an agreement that allows another individual or entity to undertake specific functions on their behalf. The entity delegating the responsibility is the principal and the entity discharging the functions assigned by the principal is called the agent (Mitnick, 1973). According to Jensen and Meckling (1976), the theory acts as the foundation of any firms in which the investors (the principals) delegate the control of resources to the management (the agents). Both the principal and the agent are seen as rational

decision makers who seek to maximize their utility. The needs of these two parties (agent and the principal) are not the same and this forces the agent, who should act on the best interest of principal to divert into his own interest in an attempt to maximize his own utility. According to Goetz (2010) a bank's organizational structure affects its lending behaviour and hence its own risk-taking behaviour and that of the competitors.

Acharya and Naqvi (2011) introduce a new dimension of the agency issues in the banking industry. They argue that when there is excess liquidity in the banks, the managers will have the urge to set wrong prices for the loans on the basis of existing risks. This happens because the likelihood of encountering shortfalls in liquidity becomes minimal. This ultimately result in over lending based on under-estimation of the underlying risks. Excess liquidity aggravates risk-taking by commercial banks through excessive lending and asset price bubbles (Acharya and Naqvi, 2011). With excessive lending (in this case associated with under-pricing of risks), there is excess quest for ownership of financial assets resulting in increase in prices beyond the basis values in the market. Acharya and Naqvi (2011) refer to this as a price bubble. The emergence of the price bubbles makes depositors to opt for savings products provided by banks that are considered safe rather than invest in the real sector. This marks the beginning of crisis in the financial sector.

The relevance of the theory to the study was founded on the fact that shareholders in the MFIs entrust the directors and managers to run the firms in profitable manner. The increment in the levels of NPLs erodes the profitability of the MFIs resulting in agency problems between the investors and the management of the MFIs. In this

regard, the information on the variables that have impact on NPLs assist managers in minimising NPLs and consequently avoid agency problems.

2.2.2 Theory of Information Asymmetry

The information asymmetry theory was developed by Akerlof (1970), Spence (1973) and Stiglitz (1975). This model states that information symmetry occurs when parties in a transaction have unequal knowledge, that is, one of the parties have better information than the other party. The information asymmetry theory is grounded on the extent to which the creditor has sufficient and correct information on the credit standing and risk propensity of the borrower (Richard, 2011). At the time of advancement of credit to the borrower, the creditor may lack adequate information to determine the tendency of the borrower to default on the loan (Richard, 2011). Some creditors use the information on the streams of income of the borrower including salaries and history provided by the borrower. However, such information may not be enough to properly evaluate the credit worthiness of the borrower.

The individual or agency such as the borrower who is knowledgeable on the information sought after like the credit standing is able to strike better deals than the creditor (Richard, 2011). The agency that lacks sufficient information on the party they are dealing with may end up with a good or bad decision. Lack of information results in adverse selection in which the disadvantaged party end up with the inappropriate decision. Inequality of information between the financial institutions and the borrowers constitutes a moral hazard that has led to upsurge in NPLs (Bester, 2014).

The theory was relevant to this study because eradication of information asymmetry improves management of credit risks and reduce NPLs. Any hidden or classified information held by either the financial institutions or the borrower affects management of loan portfolio. Therefore, the process of appraisal of loans need to be done in a diligent manner through either loan or credit officers. The knowledge generated in this study intends to minimise information asymmetry as far as variables that have pact on NPLs are concerned.

2.2.3 Modern Portfolio Theory

Modern Portfolio Theory (MPT) was developed by Markowitz (1952). The main principle in the Modern Portfolio Theory (MPT) is random walk hypothesis that views the path followed by assets as one that is not predictable and is dependent on increase in earnings realized on each share (Chandra &Leong, 2017). The MPT theory guides firms to reduce risks and optimize profitability by enabling prudent selection of assets to invest in (Chandra & Leong, 2017).

The modern portfolio theory determines that a portfolio approach as opposed to an asset-by-asset approach is more efficient in measurement and monitoring of risk. The MPT advocates for the establishment of portfolios that enable selection of appropriate assets. The theory infers that better measurement and monitoring of risk through a portfolio approach would result in minimization of risk and maximization of returns. Further, it proposes an efficient systems of managing credit with a view to reduce NPLs (Chandra& Leong, 2017).

The choice of the appropriate portfolio for asset management and the best approaches to diversify assets depends on determinants such as portfolio size, the total yields

from assets of each portfolio and the determined ownership risks attached to specific assets. The managers of MFIs and other financial institutions are therefore charged with the responsibility to make decisions that result in prudent management of asset portfolios (Nzongang & Atemnkeng, 2006).

The theory was found to be suitable in this study since it provided the basis for assessment of vector of risks such as interest and inflation rates that can impact on management of assets which in this case the portfolio of loans in MFIs. This theory applies in this study in that, loan performance can be influenced by vector of risks such as interest and inflation rates.

2.3 Macroeconomic Factors and Non-Performing Loans

NPLs serve as an important metric for assessment of the efficiency of lending in financial institutions (Radivojevic and Jovovic, 2017). The financial performance of MFIs therefore relies on prudent management of loans and specifically NPLs. This section discuses macroeconomic factors that have impact on NPLs.

2.3.1 Gross Domestic Product growth

Studies by Love (2013) and Skarica (2014) found that the growth in GDP is negatively related to NPLs. The rise in the rate of growth of GDP leads to fall in the levels of NPLs and decline in GDP growth result in higher amounts of NPLs. As the economy performs better, the more the individuals or businesses earn and the higher the rate of payments of loans. Meltdown in the economy render borrowers unable to repay their loans and the net effect is the rise in loan defaults and NPLs (Wood & Skinner, 2018).

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Another avenue through which improved performance in the economy (rise in GDP growth) leads to fall in NPLs is the creation of employment and improved ease of doing business (Beaton, Myrvoda and Thompson, 2016). The rates of unemployment reduce in an economy as the GDP growth improves enabling individuals to earn income that can be disposed in acquisition and servicing of loans. This leads to decline in NPLs (Viswanadham, 2015). Nonetheless, caution should be taken because increased growth in the GDP may encourage issuance of cheaper loans which may in turn increase the number of bad debtors and NPLs in the long run (Viswanadham, 2015).

2.3.2 Inflation

Inflation can result in either increase or decrease in the levels of NPLs (Nkusu 2011 and Klein, 2013). In the first account, the level of NPLs can reduce with increase in inflation by reducing the due debts owned by the debtor. Therefore, the debtor's ability to pay the loan is enhanced as inflation rises (Klein, 2013 and Ghosh, 2015). Similar argument was advanced by Wood and Skinner (2018) who established that the value of unpaid declines as the inflation increases.

On the second account, the increase in inflation can lead to upsurge in NPLs as the ability of debtor to pay for the loans declines. The escalation in the prices of commodities can exert constraint on debtor's income making them unable to pay for loans thus the upsurge in NPLs (Klein, 2013 and Farhan *et al.,* 2012). Moreover, financial institutions can raise the premiums and rates of interest as inflations upsurge. This occurs as creditors perceive rise in inflation as signs of unsteadiness in the

economy. Escalation in inflation hampers cash flow and make loan repayment hard for the debtors (Wood and Skinner, 2018).

2.3.3 Exchange rate

Fluctuations in the rate of exchange have ambiguous impact on NPLs. The surge in the levels of NPLs as a result of depreciation in the rate of exchange occurs when money is borrowed in foreign currency (Klein, 2013; Beck, 2015). Conversely, the values of NPL can diminish with escalation of the rates of exchange as companies that export goods improve their capacity to pay loans.

The nations in Africa that have fixed rates of exchange experience rise in the levels of NPLs as the real effective rates of exchange declines. The companies that export goods lose competitive advantage as the cost of commodities destined for export rises in a country where currency appreciates. Consequently, the ability of such export firms to repay their loans reduces leading to accumulation of NPLs (Akinlo & Emmanuel, 2014).

A great proportion of loans borrowed in foreign currency than loans in local currency results in poor economic performance in the event of deprecation of local currency (Tanaskovic & Jandric, 2014). The levels of NPLs surges when there are large loans borrowers in foreign currencies by debtors who have not hedge their firms against the risks of currency devaluations (Beck, Jakubik & Piloiu, 2013). As local currency undergoes devaluation, debtors with foreign loans encounter financial constraints in paying back the loans as the cost of loans upsurge (Touny & Shehab, 2015).

2.3.4 Interest Rate

A direct relationship exists between the rate of interest and the levels of NPLs, that is, the levels of NPL rises with the rise in the rates of interest and falls when rates of interest reduces (Ghosh, 2015). The cost of loans increases as the rates of interests increases debt values and make repayment difficult. Consequently, financial institutions that charge high rate of interest accrue a lot of bad debts (Brewer III, Deshmukh & Opiela, 2014).

When financial institutions highly rate the likelihood of their potential clients to default on loans, they tend to charge high rates of interest. The results of such high rates of interest is the low capacity of debtors to pay for their loans and increase in NPLs (Viswanadham, 2015). Substantial changes in the rates of interest influences the ability of customers to pay their debts (Love, 2013). The likelihood of customers to default on loans and NPLs also increases when high rates of interests result from increased cost of intermediation (Chand, 2012). In the events of financial liberalization that allows spreading of interest rates over a long period, the levels of NPLs fall because the debtors are able to afford smaller interests remitted periodically (Luyeku & Otinga, 2019).

2.3.5 Unemployment

The rate of unemployment is directly proportional to the levels of NPLs (Wood & Skinner, 2018). The rise in the number of unemployed people result in financial constraint on household income and hampers repayment of debts. The increase in the rate of unemployment could be an indicator of an economy that is performing so

poorly that the rate of retrenchment is high. People that are out of employment cannot pay for their loans leading to rise in NPLs (Wood & Skinner, 2018; Nkusu, 2011).

The rise in the rates of unemployment is also accompanied by poor business environment where the number of people buying products decline. Consequently, firms and individuals that operate on credit are not able to pay for their loans leading to upsurge in NPLs (Akinlo & Emmanuel, 2014). Conversely, rise in employment rate denotes increased household income and improved ability to pay loans and fall in NPLs.

2.3.6 Other factors influencing NPLs

NPLs are also influenced by other factors besides macroeconomic variables. According to Kariuki (2014), NPLs are influenced by institutional-specify factors like types of loan products and risks attached to them, clear policies on debt management, training offered to staff on credit management, loan repayment schedules, use of technology, loan repayment incentives to borrowers and the size of loan portfolio. NPLs can also be affected by customer related factors such as the knowledge of customer on business and financial management, income of the customers (Kariuki, 2014). Loan repayment is also influenced by government regulations such as directives on interest, political stability in the country.

Namutenda and Muturi (2017) argue that NPLs are influenced by the lending policies on joint liability of group members in a partnership, penalties charged on loans, and policies on loan monitoring. According to Kamande (2017), NPLs are influenced by bank-specific factors such as liquidity, earning ability, asset quality, capital adequacy and efficiency of management. Nasieku (2014) established that NPLs were also

affected by bank ownership, risk assessment and budgetary allocation to loan mentoring departments.

2.4 Empirical Evidence on Non-Performing Loans

Radivojevic and Jovovic (2017) sampled 25 nations with emerging economies with the aim of establishing the factors that influence the ration of NPLs using secondary data gathered for the years 2000-2011. The results revealed that NPL ratio was significantly caused by GDP but inflation did not have impact on NPLs. The quality of assets held by financial institutions especially banks depended on growth of the economy.

Makri, Tsagkanos and Bellas (2014) set out to determine the link between macroeconomic variables and the levels of NPLs in the banking industry within the Eurozone. The study covered the years 2000-2008. They concluded that the growth in the economy and the level of public debt influenced NPLs. Non-performing loans was also determined by financial performance of the banks. The levels of NPLs increased as the levels of debt increased and as unemployment rose. An economy that was growing led to decline in NPLs.

Dins (2013) analysed the impact that the rates of interest had on NPLs. The units of observation were banks in Malaysia. Dins (2013) concluded that a significant association existed between NPLs and the rates of interest. The rise in the rates of interest caused an upsurge in the NPLs. The levels of unemployment also affected NPLs. Increment in the rates of unemployment was accompanied by increase in NPLs.

Onchomba (2014) assessed the macroeconomic factors that determined the levels of NPL among Kenyan mortgage companies. The study concluded that the levels of NPLs was dependent on loan losses reserve ratio and the rates of unemployment, interest and growth of GDP. Onchomba (2014) argued that change in NPLs was directly proportional to changes in rates of interest and unemployment. Lack of employment was accompanied by shortage of income and inability to repay loans.

Luyeku and Otinga (2019), carried out a research to assess whether profitability of commercial banks depend on the spread of the interest rates. The study was conducted in Kakamega County, Kenya. Luyeku and Otinga (2019) determined that interest rate spread and discount rates were significant determinants of the performance realized by banks in regard to management of loans. Consequently, the spread of the rates of interest had bearing on NPLs. According to Luyeku and Otinga (2019), commercial banks should be alert on discount window by the central bank so as to access more loanable funds with minimal administrative costs so as to compensate for seasons of net loan losses.

Wood and Skinner (2018) examined the two categories of factors that had impact on NPLs. Wood and Skinner (2018) collected data from banks across the years 1991 to 2015. The first set of factors was bank related performance indicators such as ROA, the ratio of loans to deposits, ROE and the ratio of capital adequacy. The second set of variables were macroeconomic factors including rates of interest, growth of the economy (growth of GDP) and the status of unemployment. The two set of factors considered by Wood and Skinner (2018) affected NPLs.

Warue (2012) considered factors institutional related factors and external forces that had impact on NPLs. The assessment focused on Kenyan self-help groups and MFIs. Warue (2012) performed a regression analysis and concluded that NPL was influenced by the systems instituted by the firms to manage information about the customers and the performance of the economy. The two variables were directly related to NPLs.

Ndede and Kavoya (2017) did a study to establish how market structure affects the NPLs. The firms of interest in the study were banks in Kenya. Results showed that market structure affect NPLs. Growth of credit and capital positively affects non-performing loans. Bank risk appetite negatively affected NPLs pointing to overreliance on traditional banking practices to generate revenues while profitability does not affect the growth of NPLs. Ndede and Kavoya (2017) concluded that banks have to undertake business model innovation to move from traditional banking practices. Secondly, central bank should control liquidity since increase in capital positively affects non-performing loans.

Onuko, Muganda and Musiega (2015) assessed whether management of credit risk affected NPLs. Onuko *et al.,* (2015) focused on the banking sector. According to Onuko *et al.,* (2015) non-performing assets in the banks was affected by the prices set on loans. Consequently, price policies on loans had impact on NPLs. Management of credit risk had bearing on the effectiveness on the control of NPLs. A robust systems of managing risks minimises asymmetry in information about debtors' credit worthiness thereby reducing chances of default on loans.

A study on NPLs in Kenyan Savings and Credit Co-Operative Societies (SACCOs) was performed by Kiprotich (2017). The focus of the study was the personal, social and economic status of the members of the SACCOs. The study concluded that behaviour of customers towards loan repayment was affected by economic status (employment status and the amount of income) and individual characteristics (level of education, peer influence, age, marital status and gender).

Bichanya and Aseyo (2013), examined whether financial discipline of the bowers, capacity building and credit monitoring by Kenyan MFIs affected NPLs. Bichanya and Aseyo (2013) found out that the availability of an efficient system of monitoring credit minimizes NPLs. MFIs that lacked good systems to monitor credit accumulated NPLs. According to Bichanya and Aseyo (2013), inadequate training of customers on financial discipline and prudent use of loans led to upsurge in NPLs. Some borrower ends up using the credit on activities or items for which the loan was not intended thus facing difficulty in repayment.

2.5 Conceptual Model

The interactions between the variables are illustrated in Figure 2.1. The study expected NPL to be affected by rates of interest, exchange, inflation and growth of GDP. The relationship shown presents NPL as independent variable of the study while exchange, inflation, rates of interest, as well as growth of GDP as independent variables.

```
┌─────────────────────────────┐
│                             │
│  Growth Domestic Product    │
│                             │
└─────────────────────────────┘

┌─────────────────────────────┐
│                             │                    ┌─────────────────────────┐
│      Inflation Rate         │                    │                         │
│                             │                    │   Non-performing loans  │
└─────────────────────────────┘                    │                         │
                                                   │                         │
┌─────────────────────────────┐                    └─────────────────────────┘
│                             │
│      Exchange Rate          │
│                             │
└─────────────────────────────┘

┌─────────────────────────────┐
│                             │
│      Interest Rate          │
│                             │
└─────────────────────────────┘

┌─────────────────────────────┐
│                             │
│    Rate of Unemployment     │
│                             │
└─────────────────────────────┘
```

Independent Variables   **Dependent Variable**
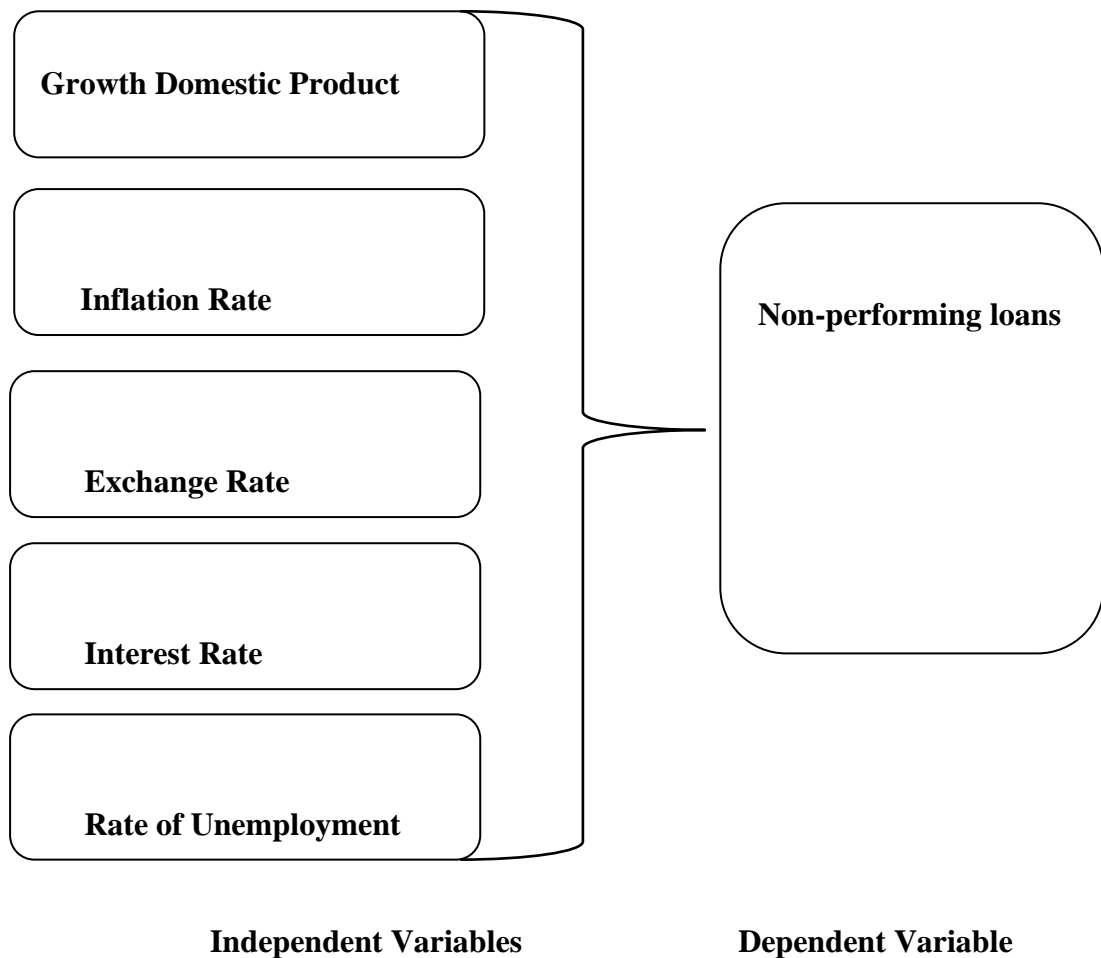
Figure 2.1: Conceptual Model

Source: Researcher (2020)

2.6 Summary of Literature Review and Research gap

As evidenced in the chapters' one and two, the problem of NPLs is a worldwide concern. Upsurge in the amounts of NPLs has the potential to destabilize the economy. Accordingly, a lot of focus in both academic and financial sectors has been directed at understanding the causes of NPL and approaches to curb or minimize NPLs. As part of the efforts to curb NPLs, scholars continue to research on factors that contribute to NPLs. The theories considered in the study provided a background

upon which NPLs can be efficiently managed. Specifically, the theories points towards efficient information management systems to minimise asymmetry in information between creditors and debtors. The theories also advocate for prudent management of loan portfolios.

The empirical literature revealed that research on NPLs in Kenya has been directed to commercial banks (Luyeku & Otinga, 2019; Ndede & Kavoya, 2017; Onuko *et al*., 2015) and SACCOs (Kiprotich, 2017). The study by Bichanya and Aseyo (2013) on MFIs focused on institution-specific and lender-specific causes of NPLs. From the literature reviewed, it was evident that no empirical research had evaluated the linkage between NPLs and macroeconomic variables in the context of the Kenyan MFIs. The information on the influence of macroeconomic variables on NPLs among microfinance institutions is valuable to policy makers in enhancing management of loan portfolio. This research gap exists despite the critical role that microfinance institutions play in enhancing access to credit by SMEs in Kenya. The study sought to bridge the research gap by examining the influence of macroeconomic factors on non-performing loans among microfinance institutions in Kenya. The variables of interest in the study are NPL, interest rate, inflation, exchange, and growth of GDP.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The study sets out to evaluate the link between macroeconomic factors and NPLs in Kenyan microfinance institutions that provide credit facilities to customers dealing in medium and small business ventures. This chapter presented the methods used to achieve the objectives of the study.

3.2 Research Design

The study was premised on descriptive survey approach to research. The design facilitated comprehensive assessment of the role of macroeconomic variables on NPL level in Kenyan MFIs. The descriptive design was deemed appropriate because it enabled the researcher to establish a causal-effect relationship between variables.

3.3 Population

Study population comprised of the units which form the basis of study observations and in the respect to this study it was the MFIs operating in Kenya. This study targeted Kenyan Microfinance Banks. The Central Bank of Kenya had licenced 13 Microfinance Banks as at December 2019 refer appendix I (attached). The study carried out a census of all the 13 licenced MFIs based on a ten (10) year period.

3.4 Data Collection Methods

All the data collected was secondary and quantitative. The data included the ratio of NPLs, the rates of growth in GDP, annual interest rates, annual exchange rates (USD),

unemployment rates and inflation rates in Kenya covering the period 2009 to 2018 for the thirteen (13) MFIs and for a period of ten (10) years, it resulted to a total of 130 observations. The ten-year period of study was appropriate because the oldest licenced MFI by the name Faulu Microfinance Bank was established in the year 2009 (CBK, 2019). The data on the ratio of NPLs was gathered from the 13 MFIs. The data on rates of growth in GDP, exchange rate (USD), unemployment rate and rate of inflation was sourced from Kenya Bureau of Statistics.

3.5 Data Analysis

Descriptive and inferential statistics were applied in analysis of collected data. Descriptive was done to establish the minimum, maximum, means, standard deviation as well as skewness and kurtosis. Skewness and Kurtosis test was employed to test for data normality. Test for heteroscedasticity was done through use of a scatter plot which helped in indicating the statistical variance of dispersion.

On the other hand, inferential statistics entailed correlation which was used to measure the association between variables and regression statistics used to estimate the relationship between the dependent variable (nonperforming loans) and the independent variables (rates of growth in GDP, exchange, employment, interest and inflation). Bound testing was done using F-statistic and p – values.

3.5.1 Model Specification

The study used the NPL ratio as the dependent variable while the independent variables were: gross domestic product growth rate, inflation rate, exchange rate, interest rates and the rate of unemployment in Kenya.

The Regression model was presented as follows:

$$\text{NPL}_t = \beta_0 + \beta_1(GDP)_t + \beta_2(Inf)_t + \beta_3(Exch)_t + \beta_4(Int)_t + \beta_5(Unemp)_t + \varepsilon_t$$

Where:

βo is a constant

$\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 represent the estimated coefficients at time t

NPL, GDP, Inf, Exch, Int, Unemp, represent NPL ratio, GDP growth rate, inflation rate, exchange rate, interest rates and rate of unemployment in Kenya respectively.

ε_t represents the error term.

3.6. Operationalization of Study Variables

Table 3.1 shows how the study variables were operationalized. It indicates the metrics for each study variable and the statistical measurement used to analyse the data.

Table 3.1: Operationalization of the Variables

Variable	Metric	Statistical Measurements
Non-Performing loan	Non-performing Loans Ratio	Correlation / Regression
Gross Domestic Product	GDP growth rate	Correlation / Regression
Rate of Inflation	Consumer Price Index	
Exchange	Real Exchange Rates	Correlation / Regression
Interest	Commercial Interest Rates	
Unemployment	Rate of unemployment	Correlation / Regression

CHAPTER FOUR: DATA PRESENTATION AND DISCUSSION OF STUDY FINDINGS

4.1 Introduction

The initial aim of this study was to establish the influence of macroeconomic factors on non-performing loans among deposit-taking microfinance institutions operating in Kenya. The independent variables were macroeconomic factors which in study inflation, GDP, interest rates, exchange rates and rate of unemployment. Nonperforming loans within MFIs was in this case used as dependent variable and was measured in ratio of NPL/total loans and advances. Therefore, this chapter is comprised of the statistics and results used to test these relationships with the subsections of tests for normality and heteroscedasticity, descriptive statistics, correlations tests, and regression estimates.

4.2   Tests for Data Normality and Heteroscedasticity

The study resolved to begin with checking whether the research data was normalized and well dispersed and test of heteroscedasticity done through use of scatter plots.

4.2.1   Tests for Normality

Normality was estimated through use of skewness and kurtosis which enable the researcher to check the existence of variations in the data being investigated. For data to be normally distributed, skewness and kurtosis values should range from -1.00 and 1.00 for normality test, or should be three times the values for the standard error. The outcomes for skewness and kurtosis are as indicated in Table 4.1.

Gross domestic product reported a skewness value of 0.080 (SE= 0.263) and kurtosis value of 5.560 (SE = 0.520); exchange rate based on USD provided a skewness value of -0.550with a similar standard error of 0.263 and a kurtosis value of -1.271 (SE = 0.520). The skewness value for interest rates was 0.240 (SE = 0.263) with a kurtosis value of -0.486 (SE = 0.520). That of unemployment rate was -0.475 (SE = 0.263) with a kurtosis value of -1.056 (SE = 0.520). The results of these constructs have implication that the data of the mentioned variables was approximately normally distributed.

Table 4.1: Tests of Normality of the Study Variables Using Skewness and Kurtosis

Constructs	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
NPL Ratio	81	1.493	.267	1.791	.529
GDP	84	.080	.263	5.560	.520
Inflation	84	1.655	.263	2.811	.520
Exchange Rate (USD)	84	-.550	.263	-1.271	.520
Interest Rates	84	.240	.263	-.486	.520
Unemployment Rate	84	-.475	.263	-1.056	.520

Source: Research data (2020)

On the other hand, NPL ratio provided a slightly higher skewness value of 1.493 (SE = 0.267) and still gave a higher kurtosis value of 1.791 (SE = 0.529). Furthermore, the construct of inflation as well gave a skewness value of 1.655 (SE = 0.520) and a kurtosis value of 2.811 (SE = 0.520) which seem to be beyond the recommended range of -1.00 and 1.00. The results have indication that the data for NPL ratio and inflation tend to skew on one side and therefore not well distributed.

4.2.2 Heteroscedasticity Tests

Heteroscedasticity test was done through use of a scatter plot which has the ability of revealing the variance in statistical dispersion as shown in Figure 4.1.
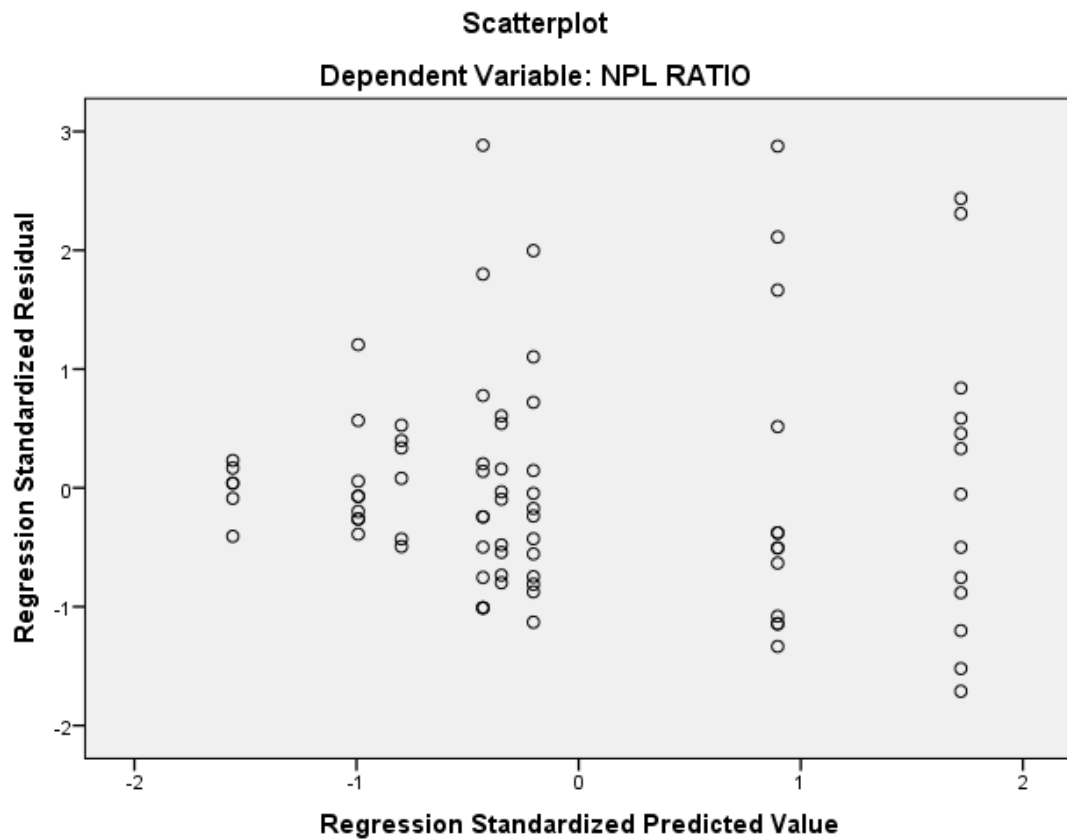
Figure 4.1: Tests of Heteroscedasticity Using Scatter Plots

Source: Research Data (2020)

The scatter plot shows the data point patterns being well spread apart with no pattern to the residuals plotting against the fitted values. This could imply that the variance of the residuals assumed consistence and thus, led to conclusion that the variance of the residuals was homogeneously consistent across all levels of the values predicted. Moreover, the residuals demonstrated most of the data points concentrated within the central part around zero. The data point patterns were shaped a pattern-less cloud of

dots which has implication that the assumption of heteroscedasticity was met in in the variables under study.

4.3 Descriptive Statistics

Descriptive tests were estimated to establish various measures of central tendencies. Table 4.2 contains results on this estimates.

Table 4.2: Descriptive Distribution

Constructs	N	Minimum	Maximum	Mean	Std. Deviation
NPL (millions)	81	.00	4,301.00	466.43	937.48
Loans and advances (millions)	81	11.00	22,189.00	3490.72	6,331.51
NPL ratio	84	.00	.72	.19	.17
GDP	84	2.60	8.40	5.67	.75
Inflation	84	3.97	13.97	7.12	2.36
Exchange rate (USD)	84	77.30	103.40	95.36	7.71
Interest rates	84	13.06	19.64	15.63	1.86
Unemployment rate	84	2.63	2.87	2.77	.08

The findings have shown that the minimum NPL was zero and the maximum being 4.3 billion. On average, the micro finance institutions recorded about 466 million in terms of nonperforming loans for a span of ten years. The minimum loans given to customers in a ten-year period was 11 million and the maximum value of loan/advances was 22.2 billion. The results have revealed that the 13 MFIs were able

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to lend about 3.5 billion on average. The minimum ratio of NPL to loans/advances was zero percent with maximum being 72%.

It can further be seen that the average NPL ratio report by the findings was 18.8%. The minimum growth of GDP within the period of ten years is 2.6% and the maximum stood at 8.4%. The average growth of GDP was at 5.7%. Banking sector was also found to be hit by inflation in the years ranging from 2009 to 2019 where the minimum rate of inflation reported within this period was 4% while the maximum was 14%. On average, the MFIs were affected by 7.1% rate of inflation.

The exchange rate was estimated based on USD as the main currency and the results indicate that the exchange rate between a dollar and Kenyan shilling did not fluctuate much in the period under study. The minimum dollar value was exchanged at Ksh. 77.30 while the highest exchange of dollar to Kenyan shilling was at Ksh. 103 and forty cents and average range of exchange rate in the span of ten years was 1 dollar exchanging at USD 95.36. The interest rates charged by banking sector in the past ten years was 15.6% on average, lowest being 13.06% and highest charges being 19.64%. Unemployment was also estimated as a factor that influence NPL and the study reported a stead unemployment rate the lowest being 2.63% and the highest was 2.87%. Averagely, the rate of unemployment within the ten-year period under investigation was at 2.77%.

4.4 Correlation Statistics

The study used Pearson correlation method in estimation of the degree of association that existed between the macroeconomic factors and NPL. Coefficients of correlated values (r) were given and significance level was tested based on p – values, using a

confidence interval of 95%. In this case, correlation output was considered to be significant with the p – value ≤ 0.05. The correlation outcomes displayed in Table 4.3has indication that growth in GDP is not significantly associated with NPL as it provided an r value of -0.010 and p – value >0.05. Inflation rate is statistically associated to NPL ratio in that, an increase in rate of inflation is associated with decrease in NPL ratio within MFIs and vice versa given an r value of -0.226 and p - value of 0.038.

Furthermore, exchange rate has a positive association on NPL ratio ($r = 0.393$, p – value). This can also be interpreted to mean that an increase in the exchange rate is statistically associated with 39.3% increase in the magnitude customers of MFIs defaulting their loans. In addition, an increase in interest rates is statistically associated with decrease in nonperforming loans within the MFIs operating in Kenya by 33.8% ($p = 0.002$). Likewise, unemployment rate is reported a negative association towards NPL, where it was discovered that a decrease in employment rate is statistically associated with 47.6% increase in NPL.

Table 4.3: Results of Correlation Analysis

Constructs		NPL RATIO	GDP	INFLATION	EXCHANGE RATE (USD)	INTEREST RATES (%)	UNEMPLOY MENT RATE (%)
NPL Ratio	Pearson Correlation	1	-.010	-.226[*]	.393[**]	-.338[**]	-.476[**]
	Sig. (2-tailed)		.930	.038	.000	.002	.000
	N	84	84	84	84	84	84
GDP	Pearson Correlation	-.010	1	-.383[**]	.014	-.248[*]	-.059
	Sig. (2-tailed)	.930		.000	.899	.023	.593
	N	84	84	84	84	84	84
Inflation	Pearson Correlation	-.226[*]	-.383[**]	1	-.282[**]	.176	.368[**]
	Sig. (2-tailed)	.038	.000		.009	.109	.001
	N	84	84	84	84	84	84
Exchange rate (USD)	Pearson Correlation	.393[**]	.014	-.282[**]	1	-.573[**]	-.803[**]
	Sig. (2-tailed)	.000	.899	.009		.000	.000
	N	84	84	84	84	84	84
Interest rates	Pearson Correlation	-.338[**]	-.248[*]	.176	-.573[**]	1	.818[**]
	Sig. (2-tailed)	.002	.023	.109	.000		.000
	N	84	84	84	84	84	84
Unemployment rate	Pearson Correlation	-.476[**]	-.059	.368[**]	-.803[**]	.818[**]	1
	Sig. (2-tailed)	.000	.593	.001	.000	.000	
	N	84	84	84	84	84	84

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

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

4.5 Regression Estimations

This study further estimated the effect of variables through regression statistics. The regression model produces three sections namely model summary, analysis of variance as well as test of coefficients. The determination of goodness fit of the model was based on the R squared provide in the model summary results. Analysis of Variance (ANOVA) output was interpreted based on F and $p–$ values where the study relied on a confidence interval of 95% and thus any hypothesis could be reject if the error margin goes beyond 5% (0.05). The coefficient of variable estimation was done focusing on t – tests and p – values used in measuring the significance level of coefficients of each independent variable on dependent variable. The study resolved to test the relationship between each macroeconomic factor under study with NPL and thereafter, estimated a combine effect of all the macroeconomic factor on NPL.

4.5.1 Relationship between GDP and NPL

The study tested the effect of GDP on NPL and the summary results given in Table 4.4 indicate that the regression model provided a correlation R-value of 0.048 and an R squared value of 0.002. This has indication that the gross domestic product was found to have the ability of explaining only 0.2 percent of change in NPL.

Table 4.4: Model Summary for GDP and NPL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.048[a]	.002	-.010	.17419

a. Predictors: (Constant), GDP

The output of ANOVA shown in Table 4.5 below gave sum square of a regression as 0.006 and a higher sum square for residual as 2.397 with mean square value of 0.006 for regression and 0.030 for residual. The model further gave an F – value of 0.185 and p – value of 0.668. This revelation therefore informs the study to fail to reject the null hypothesis that "GDP do not have significant influence on nonperforming loans" since the p – value is higher than the recommended 0.05.

Table 4.5: Analysis of Variance (ANOVA) for GDP and NPL

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.006	1	.006	.185	.668[b]
	Residual	2.397	79	.030		
	Total	2.403	80			

a. "Dependent Variable: NPL Ratio"
b. "Predictors: (Constant), GDP"

Based on coefficient results given in Table 4.6, it can be construed that gross domestic product has a weak relationship towards nonperforming loans. This relationship provided a coefficient value of 0.016 ($t = 0.431$) and a weak p value of 0.668)

Table 4.6: Coefficient Statistics for GDP and NPL

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.105	.207		.507	.613	-.308	.518
	GDP	.016	.037	.048	.431	.668	-.057	.089

a. Dependent Variable: NPL Ratio

4.5.2 Relationship between Inflation and NPL

Another macroeconomic factor under investigation was inflation and thus the study test its effect on NPL. The summary of model results produced an R value of .263 and an R squared of .069 as shown in Table 4.7. This has indication that inflation is likely to explain change in NPL by a margin of 6.9% the remaining percentage can be explained by different variables not included in the model.

Table 4.7: Model Summary for Inflation and NPL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.263[a]	.069	.057	.16826

a. Predictors: (Constant), Inflation

The analysis of variance findings indicated in Table 4.8 show a regression sum square value of .166 (Mean square = .166) and a residual sum square of 2.237 (Mean square = .028). The inflation and NPL model provided an $F - value$ of 5.862 with a significance value ($p = 0.018$). This could imply that we should reject the null hypothesis that inflation does not affect NPL significantly since the error we make by doing so is <0.05.

Table 4.8: ANOVA for Inflation and NPL

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.166	1	.166	5.862	.018[b]
1	Residual	2.237	79	.028		
	Total	2.403	80			

a. "Dependent Variable": NPL Ratio

b. "Predictors: (Constant)", Inflation

Table 4.9 has coefficient results for inflation and NPL. It can be deduced that inflation affects NPL negatively as it gave a coefficient value of -.020 ($t = 2.421$) supported with a

significant *p* value of .018. In other words, an increase in inflation rate decreases cases of loan defaulting within microfinance institutions by 2%.

Table 4.9: Coefficient for Inflation and NPL

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.334	.061		5.500	.000	.213	.455
	Inflation	-.020	.008	-.263	-2.421	.018	-.036	-.003

a. Dependent Variable: NPL Ratio

4.5.3 Relationship between Exchange Rate (USD) and NPL

The relationship between exchange rate based on USD and NPL was estimated to determine the effect of the two variables. The regression summary model provided in Table 4.10 indicates the model's R value to be.348 with an R squared value being .121. This means that the variable of exchange rate alone is able to explain 12.1% change in NPL.

Table 4.10: Model Summary for Exchange Rate (USD) and NPL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.348[a]	.121	.110	.16352

a. Predictors: (Constant), Exchange Rate (USD)

The ANOVA results given in Table 4.11 disclose that the model produced a regression sum square of .290 together with a residual sum square of 2.112. These were accompanied

by a mean value of .290 for regression and .027 for residual. Given an *F* statistic of 10.856 and a *p* value of .001, it means that the study should reject the null hypothesis that exchange rate does not have a significant influenced on NPL.

Table 4.11: ANOVA for Exchange Rate (USD) and NPL

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.290	1	.290	10.856	.001[b]
1	Residual	2.112	79	.027		
	Total	2.403	80			

a. "Dependent Variable": NPL Ratio

b. "Predictors: (Constant)", Exchange Rate (USD)

Furthermore, the model on exchange rate and NPL produced outputs of coefficients as indicated in Table 4.12. The construct of exchange rate provided a coefficient value of .008, followed by a *t* value of 3.295 and a strong *p* value of .001. An indication that when the exchange rate goes higher, the chances of people defaulting increases by 0.8%.

Table 4.12: Coefficient for Exchange Rate (USD) and NPL

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.616	.246		-2.498	.015	-1.106	-.125
	Exchange Rate (USD)	.008	.003	.348	3.295	.001	.003	.014

a. Dependent Variable: NPL Ratio

4.5.4 Relationship Between Interest Rates and NPL

The regression analysis was also used to test the effect of interest rates on NPL. The outcomes of the model summary given in Table 4.13 show that the model provided a correlation R value of .376 and an R square of .142. An implication that interest rates has ability of explaining about 14.2% in the variation of nonperforming loans.

Table 4.13: Model Summary for Interest Rates and NPL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.376[a]	.142	.131	.16156

a. Predictors: (Constant), Interest Rates

The ANOVA outcomes on the relationship between interest rates and NPL shown in Table 4.14 suggests that the model gave a regression sum squares of .340 (regression) with the same mean square and 2.062 (residual) with a mean square of .026. The model further presented an $F - value$ of 13.045 accompanied with a p value of .001. This could imply that we reject any null hypothesis that interest rate has no significant relationship on NPL.

Table 4.14: ANOVA for Interest Rates and NPL

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.340	1	.340	13.045	.001[b]
1	Residual	2.062	79	.026		
	Total	2.403	80			

a. Dependent Variable: NPL Ratio

b. Predictors: (Constant), Interest Rates

Table 4.15 presents the findings on coefficients of interest rates as -.035 and an absolute t value of 3.612 together with a statistically significant p value of .001. The findings indicate that a reduction in rates of interest charged by MFIs leads to an increase in cases of loan defaulting by 3.5%.

Table 4.15: Coefficient for NPL and Interest Rate

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	.739	.152		4.865	.000	.437	1.041
Interest Rates	-.035	.010	-.376	-3.612	.001	-.054	-.016

a. Dependent Variable: NPL Ratio

4.5.5 Relationship between NPL and Unemployment

Ultimately, the study estimated the effect of unemployment on NPL. In relation to findings of the model summary displayed in Table 4.16, it can be construed that the model was able to provide an R value of .466 together with an R square value of .217. This has implication that unemployment rate can explain 21.7% in change of NPL.

Table 4.16: Model Summary for NPL and Unemployment Rate

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.466[a]	.217	.207	.15431

a. Predictors: (Constant), Unemployment Rate

Focusing on ANOVA, the results illustrated in Table 4.17 reveals a regression sum square of .521 with similar mean square. The model provided a residual sum square of 1.881 accompanied with a mean square value of .024. Moreover, an $F – value$ of 21.901 and a p value of .000 were provided. This could be translated to mean that the study should reject the tested null hypothesis that unemployment rates does not have a significant effect on NPL.

Table 4.17: ANOVA for NPL and Unemployment Rate

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.521	1	.521	21.901	.000[b]
	Residual	1.881	79	.024		
	Total	2.403	80			

a. Dependent Variable: NPL Ratio
b. Predictors: (Constant), Unemployment Rate

The predictor variable gave a coefficient value of -1.000 together with a t value of 4.680 and a strong p value of 0.000. An implication that a 100% decrease in rate of unemployment tend to incline the rate of NPL within the microfinance institutions operating in Kenya.

Table 4.18: Coefficient for NPL and Unemployment Rate

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.958	.591		5.007	.000	1.782	4.135

Unemployment Rate	-1.000	.214	-.466	-4.680	.000	-1.426	-.575

a. Dependent Variable: NPL Ratio

4.5.6 Joint Effect of Unemployment Rate, GDP, Inflation, Exchange Rate and Interest Rates on NPL Ratio

After estimating the effect of individual predictor variable on independent variable, the study resolved to test the combine effect of all the macroeconomic factors under study on NPL. The summary results given in Table 4.19 indicate that the regression model provided a combined correlation R-value of 0.483 and an R squared value of 0.234. This has indication that the entire set of independent variable under study (gross domestic product, unemployment rate, inflation, exchange rate and interest rates) were found to explain approximately 23.4 percent of variation in NPL ratio. An indication that there exist other predictor variables not in the model which could be included to improve the model's goodness of fit.

Table 4.19: Model Summary for Joint Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.483[a]	.234	.182	.15670

a. Predictors: (Constant), Unemployment Rate, GDP, Inflation, Exchange Rate (USD), Interest Rates

The output of ANOVA shown in Table 4.20 below gave a regression sum square of .561 and a residual sum square of 1.842 with mean square value of .112 for regression and .025

for residual. An F – value of 4.570 and a significant value of 0.001, the model informs us that the independent variables used in this study were acceptable and fit to determine the dependent variable and therefore an indication that the joint effect of the predictor variables used in the study is significant in influencing NPL within the MFIs registered to operate in Kenya for a period ranging from 2009 to 2018. Thus, the study rejects the null hypothesis that gross domestic product, unemployment rate, inflation, exchange rate together with interest rates do not influence NPL significantly.

Table 4.20: ANOVA for Joint Effect

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.561	5	.112	4.570	.001[b]
1	Residual	1.842	75	.025		
	Total	2.403	80			

a. Dependent Variable: NPL Ratio

b. Predictors: (Constant), Unemployment Rate, GDP, Inflation, Exchange Rate (USD), Interest Rates

Results on coefficients given in Table 4.21 show that holding all other variables constant NPL ratio would still increase by a margin of 382.6%. However, despite predictor variables showing some significant relationship in the individual tests, none of them could predict NPL significantly when they are grouped together. GDP gave a coefficient value of -.026 ($t = .669$, $p = .506$). Inflation produced a coefficient value of -.009 accompanied with a t value of .917 and a significance level of .362. Exchange rate based on USD provided a coefficient value of -.003 ($t = .770$) and a p value of .443. In addition, interest rate has a beta value of -.004 ($t = .180$) with a p value of .858. Consequently, unemployment rate

reported a coefficient value of -1.097 accompanied with a *t* value of 1.767 and an almost

significant *p* value of .081.

Table 4.21: Coefficients for Joint Effect

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.826	1.721		2.224	.029	.398	7.254
	GDP	-.026	.039	-.080	-.669	.506	-.104	.051
	Inflation	-.009	.010	-.123	-.917	.362	-.029	.011
	Exchange Rate (USD)	-.003	.004	-.140	-.770	.443	-.012	.005
	Interest Rates	-.004	.022	-.042	-.180	.858	-.047	.039
	Unemployment Rate	-1.097	.621	-.511	-1.767	.081	-2.334	.140

a. Dependent Variable: NPL Ratio

4.6 Discussion of the Study's Key Findings

The findings have revealed that gross domestic product does not affect nonperforming

loans significantly. This was evidenced by a weak *p* – value of 0.668. This revelation is

contrary to that of Radivojevic and Jovovic (2017) whose study revealed that NPL ratio

was significantly caused by GDP but inflation did not have impact on NPLs. The findings

also contradict the findings of Wood and Skinner (2018) who reported that

macroeconomic factors affecting NPL include rates of interest, growth of the economy

(growth of GDP) as well as the status of unemployment. Nonetheless, the results have

indicated that an increase in unit of inflation rate was found to decrease cases of customers

defaulting the loans taken from microfinance institutions in Kenya significantly. The exchange rate was also reported to influence NPL significantly in that, the higher the exchange rate the higher the chances of cases of NPL within MFIs

It was further revealed that interest rates had a significant influence on NPL. The findings of the study disclosed that a reduction in rates of interest charged by MFIs leads to an increase in cases of loan defaulting by 3.5%. On opposite, a study conducted by Dins (2013) discovered a significant association existing between NPLs and the rates of interest. The rise in the rates of interest caused an upsurge in the NPLs. In addition, Onchomba (2014) argued that change in NPLs was directly proportional to changes in rates of interest and unemployment. Lack of employment was accompanied by shortage of income and inability to repay loans. It can be understood that when lenders charge low interest rates on loans, many clients tend to be attracted to taking loans which if not properly invested or managed would in turn be difficult to pay back and therefore rising cases of nonperforming loans.

Unemployment has been discovered as a key factor that determines NPL. The research revealed that a unit decrease in rate of unemployment can incline the rate of NPL within the microfinance institutions operating in Kenya by 100%. This is true because lack of employment could be a constraint to people's income which would automatically give rise to cases of loan defaulting. In support to this, Dins (2013) found out that the levels of unemployment affected NPLs significantly. When an increment in the rates of unemployment is reported, it tends to be accompanied by increase in NPLs. Likewise, Kiprotich (2017) concluded that behaviour of customers towards loan repayment was affected by economic status (employment status and the amount of income).

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presented the study findings in summarized form as outlined in chapter four. Conclusions are also made with focus on the key results of the research as well as suggestion of recommendations to be considered by the relevant authorities.

5.2 Summary of Study Findings

The main goal of this research was to "establish the influence of macroeconomic factors on non-performing loans among deposit-taking microfinance institutions in Kenya".

5.2.1 Summary of Descriptive Statistics

The findings presented in the preceding chapter have shown that the deposit taking micro finance institutions which were in operation between the year 2009 and 2018, recorded approximately 466 million in terms of nonperforming loans. The results have revealed that the 13 MFIs were able to lend about 3.5 billion on average. It was further established that the average NPL ratio as reported by the findings was 18.8%. The mean growth of GDP was at 5.7%. Averagely, the MFIs were affected by a margin of 7.1% rate of inflation. The exchange rate in the span of ten years was 1 dollar exchanging at USD 95.36 on average, 15.6% interest rates being charged by banking sector in the past ten years and the rate of unemployment being at 2.77% still on average.

5.2.2 Summary of Inferential Statistics

The correlation results have shown that inflation, interest rates, and unemployment rate are negatively associated with NPL. Contrary to that, exchange rate was found to have a statistically positive association towards nonperforming loans. GDP was reported to have an insignificant association with NPL. The study further conducted a regression analysis to first establish the effect of each independent variable and thereafter to establish the joint effect of all the macroeconomic factors on NPL. The findings have shown that inflation, interest rates, and unemployment affected NPL negatively. It was further shown that exchange rate had a significant positive relationship towards nonperforming loans of deposit taking MFIs. On contrary, GDP did not have significant effect on NPL.

The construct of gross domestic product was found to explain 0.2 percent of change in NPL. This relationship produced an F – value of 0.185 and p – value of 0.668 and this evidence made the study to fail in rejecting the null hypothesis that GDP do not have significant influence on nonperforming loans. Gross domestic product had a weak relationship towards nonperforming loans with a coefficient value of 0.016 (t = 0.431) and p – value of 0.668. The results on the relationship between inflation and NPL gave an R squared of .069 meaning inflation was likely to explain change in NPL by a margin of 6.9%. The study rejected the null hypothesis that inflation does not affect NPL significantly. Inflation was found to affect NPL negatively as the results indicated that an increase in inflation rate decreases cases of loan defaulting within microfinance institutions by 2%.

The relationship between exchange rate based on USD and NPL revealed an R squared value of .121, an indication that the variable of exchange rate alone can explain 12.1% change in NPL. The study rejected the null hypothesis that exchange rate does not have a

significant influenced on NPL since the model produced an F statistic value of 10.856 and a p value of .001. The findings as well showed that when the exchange rate goes higher, the chances of people defaulting their loans increases by 0.8%. The variable of interest rates had ability of explaining about 14.2% in the variation of nonperforming loans. The research rejected the null hypothesis that interest rates has no significant relationship on NPL. It was revealed that a reduction in rates of interest charged by MFIs leads to an increase in cases of loan defaulting by 3.5%.

The effect of unemployment on NPL was tested and study found out that unemployment rate can explain 21.7% in change of NPL. The null hypothesis that unemployment rates does not have a significant effect on NPL was rejected as it gave an F – value of 21.901 and a p value of .000. It was discovered that a unit decrease in rate of unemployment tend to incline the rate of NPL within the microfinance institutions operating in Kenya by 100%. The joint effect of the relationship between unemployment rate, GDP, inflation, exchange rate and interest rates on NPL Ratio, was found to provide an R squared value of 0.234. An implication that the entire set of independent variable under study were found to explain approximately 23.4 percent of variation in NPL ratio. The study rejected the null hypothesis that gross domestic product, unemployment rate, inflation, exchange rate together with interest rates do not influence NPL significantly, given that the joint model gave an F – value of 4.570 and a significant value of 0.001. None of the predictor variables (macroeconomic factors) was found to have a significant effect on NPL when they are grouped together in a model.

5.3 Conclusion of Findings

Based on the objective of the current study which was to establish the influence of macroeconomic factors on non-performing loans among deposit-taking microfinance

institutions in Kenya. The study concludes that macroeconomic factors influence nonperforming loans within MFIs in Kenya. The study concludes that GDP does not affect NPL in the banking sector. In a nut shell, the study can conclude that the four major macroeconomic factors namely, inflation, interest rates, exchange rate as well as unemployment rate strongly determines nonperforming loans within MFIs.

When there is increase in the rate of inflation, there is likelihood of rise in the case of customers defaulting from paying their loans. In other words, when the prices of commodities on market escalates, the chances of people's income being affected is higher and therefore being unable to pay for loans taken from lenders. When the exchange rate escalates, the cases of NPL rises because the value of dollar to Kenyan shillings goes up limiting the capacity to pay loans. Interest rates increases the cost of loans making the repayment difficult. MFIs that charge high interest rate increases the potential of clients defaulting and therefore tend to accumulate a lot of bad debts. In the same case, when a country registers high number of unemployed people, it might result to a financial constraint hence hinders repayment of debts.

5.4 Recommendations Based on the Study Findings

From the research findings realized in chapter four, it can be recommended as follows:

- The central bank should consider viable ways of regulating the macroeconomic factors to ensure availability of loans on reasonable terms.
- MFIs should observe the trends in inflation rates to guide them well before giving loans on their customers
- Financial regulators should control the interest rates charged by deposit taking microfinance institutions to enable their customer to borrow and pay on low interest rates

- The government should create jobs and an enabling business environment to reduce unemployment among the citizens

5.5 Limitation of the Study

The study was limited on establishment the influence of macroeconomic factors on non-performing loans. The study was limited to 13 deposit-taking microfinance institutions in Kenya. The study was also limited on the constructs of macroeconomic factors namely inflation, interest rates, exchange rate and unemployment rate which were used as independent variable and the aspect of nonperforming loans as dependent variable. Due to limited time and resources, the current study relied on study duration of ten years.

5.6 Suggestion for Further Research

This research focused on determining the effect of macroeconomic factors on NPL. It is therefore suggested that upcoming researches should be conducted to test the relationship of NPL with different variables other than macroeconomic factors. The study focused only on the 13 deposit-taking microfinance institutions which were in operation between 2009 and 2018. This study has a suggestion that future researchers should focus on other financial institution to establish the generalizability of the results. Furthermore, the study relied on study duration of ten years. It is therefore recommended that similar study should be conducted based on a slightly high number of years than that used in this study.

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Appendix I: Data Collection Sheet

Year	Name of Microfinance Institution	NPL	Loans/ advances	NPL ratio	GDP	Inflation	Exchange rates	Interest rates	Unemployment
2009									
2010									
2011									
2012									
2013									
2014									
2015									
2016									
2017									
2018									
2019									

Appendix II: List of Deposit Taking MFIs Under Study

1. Daraja MFI Limited

2. Rafiki MFI Limited

3. Century MFI Limited

4. Remu MFI Limited

5. Choice MFI Limited

6. Sumac MFI Limited

7. Caritas MFI Limited

8. Faulu MFI Limited

9. Uwezo MFI Ltd

10. Kenya Women MFI Limited

11. Maisha MFI Limited

12. SMEP MFI Limited

13. U & I MFI Limited

Source: CBK (2020)