FIRM CHARACTERISTICS AND NON-PERFORMING LOANS OF COMMERCIAL BANKS IN KENYA

WINFRED NDANU NGUNGU

D53/ CTY/PT/32227/2017

A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS FOR PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD MASTERS DEGREE OF BUSINESS ADMINISTRATION OF KENYATTA UNIVERSITY

NOVEMBER, 2020
DECLARATION

Declaration by the Student

I declare that this project is my original work and has not been submitted for an award of a degree in any other University for examination purposes.

Signature...................................................... Date..................................................

WINFRED NDANU NGUNGU

D53/ CTY/PT/32227/2017

Declaration by the Supervisor

This is to confirm that this work has been developed by the study under my supervision as the University Supervisor.

Signature...................................................... Date..................................................

Dr. FARIDA ABDUL

Lecturer

Department of Accounting and Finance

School of Business, Kenyatta University
DEDICATION

I dedicate this study to my grandmother (Juliana) and son (Jereus) for their encouragement and overwhelming support they accorded me in the process of compiling this work.
ACKNOWLEDGEMENT

My earnest thank you goes to All-powerful God who makes things possible, he who gave me the knowledge and capacity to undertake this research. My gratefulness goes to my supervisor Dr. Farida Abdul for her timely guidance, advice and support. Finally I acknowledge my family for continuously supporting me during this entire study period.
# TABLE OF CONTENTS

DECLARATION ................................................................................................................................. ii  
DEDICATION .................................................................................................................................... iii  
ACKNOWLEDGEMENT ....................................................................................................................... iv  
TABLE OF CONTENTS ....................................................................................................................... v  
LIST OF TABLES ................................................................................................................................ viii  
LIST OF FIGURES ............................................................................................................................ ix  
ABBREVIATIONS AND ACRONYMS ............................................................................................... x  
OPERATIONAL DEFINITION OF TERMS ...................................................................................... xi  
ABSTRACT .......................................................................................................................................... xii  

## CHAPTER ONE .......................................................................................................................... 1  
INTRODUCTION ................................................................................................................................ 1  

1.1 Background of the Study ............................................................................................................ 1  

1.1.1 Firm Characteristics .............................................................................................................. 2  

1.1.2 Non performing Loans ......................................................................................................... 3  

1.2 Statement of the Problem .......................................................................................................... 4  

1.3 Objectives of the Study ............................................................................................................ 6  

1.3.1 General Objective ............................................................................................................... 6  

1.3.2 Specific Objectives ............................................................................................................. 6  

1.4 Research Hypotheses ............................................................................................................... 6  

1.5 Significance of the Study .......................................................................................................... 7  

1.6 Scope of the Study .................................................................................................................... 7  

1.7 Limitations of the Study .......................................................................................................... 8  

1.8 Organisation of the Study ....................................................................................................... 8  

## CHAPTER TWO .......................................................................................................................... 9  
LITERATURE REVIEW ....................................................................................................................... 9  

2.1 Introduction ............................................................................................................................... 9
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Theoretical Literature Review</td>
<td>9</td>
</tr>
<tr>
<td>2.2.1 Theory of Market Power</td>
<td>9</td>
</tr>
<tr>
<td>2.2.2 Agency Theory</td>
<td>10</td>
</tr>
<tr>
<td>2.2.3 Capital Buffer Theory</td>
<td>11</td>
</tr>
<tr>
<td>2.2.4 Liquidity Preference Theory</td>
<td>12</td>
</tr>
<tr>
<td>2.3 Empirical Review</td>
<td>13</td>
</tr>
<tr>
<td>2.4 Summary of Literature Review and Research Gaps</td>
<td>17</td>
</tr>
<tr>
<td>2.5 Conceptual Framework</td>
<td>19</td>
</tr>
<tr>
<td><strong>CHAPTER THREE</strong></td>
<td>21</td>
</tr>
<tr>
<td><strong>RESEARCH METHODOLOGY</strong></td>
<td>21</td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>21</td>
</tr>
<tr>
<td>3.2 Research Design</td>
<td>21</td>
</tr>
<tr>
<td>3.3 Target Population</td>
<td>21</td>
</tr>
<tr>
<td>3.4 Empirical Model</td>
<td>21</td>
</tr>
<tr>
<td>3.5 Operationalisation and Measurement of Variables</td>
<td>23</td>
</tr>
<tr>
<td>3.6 Sampling Design</td>
<td>23</td>
</tr>
<tr>
<td>3.7 Data Collection</td>
<td>24</td>
</tr>
<tr>
<td>3.8 Data Analysis and Presentation</td>
<td>24</td>
</tr>
<tr>
<td>3.9 Diagnostic Tests</td>
<td>25</td>
</tr>
<tr>
<td>3.9.1 Multicollinearity Test</td>
<td>25</td>
</tr>
<tr>
<td>3.9.2 Stationarity Test</td>
<td>25</td>
</tr>
<tr>
<td>3.9.4 Hausman Test</td>
<td>25</td>
</tr>
<tr>
<td>3.10 Ethical Consideration</td>
<td>26</td>
</tr>
<tr>
<td><strong>CHAPTER FOUR</strong></td>
<td>27</td>
</tr>
<tr>
<td><strong>DATA ANALYSIS AND PRESENTATION</strong></td>
<td>27</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>27</td>
</tr>
</tbody>
</table>
4.2 Descriptive Analysis ........................................................................................................27
4.3 Diagnostic Tests ..............................................................................................................28
  4.3.1 Multicollinearity ........................................................................................................29
  4.3.2 Stationarity Test .........................................................................................................29
  4.3.3 Hausman Test ............................................................................................................30
4.4 Panel Regression Analysis ................................................................................................31
  4.4.1 Direct Effect Test .......................................................................................................31
  4.4.2 Moderating Effect Test .............................................................................................32
4.5 Hypothesis Testing ..........................................................................................................34

CHAPTER FIVE ..................................................................................................................40

SUMMARY, RECOMMENDATION AND CONCLUSION .................................................40

5.1 Introduction ....................................................................................................................40
5.2 Summary of the Study ....................................................................................................40
5.3 Conclusion ......................................................................................................................41
5.4 Contribution to Knowledge ...........................................................................................42
5.5 Policy Recommendations ..............................................................................................42
5.5 Suggestion for Further Research ...................................................................................43

REFERENCES ..................................................................................................................44

APPENDICES ..................................................................................................................48

Appendix I: Data Collection Guide .....................................................................................48
LIST OF TABLES

Table 2.1: Summary of Literature Review and Research Gaps ............................................................... 17
Table 3.1: Operationalisation and Measurement of Research Variables .............................................. 23
Table 4.1: Descriptive Statistics ........................................................................................................... 27
Table 4.2: Correlation Matrix .............................................................................................................. 29
Table 4.3 Hadri LM Test for Unit Root ............................................................................................... 29
Table 4.4 Hausman Test ..................................................................................................................... 31
Table 4.5: Effect of Firm Characteristics on Non Performing Loans .................................................... 32
Table 4.6 Moderation Test, Step One .................................................................................................. 33
Table 4.7 Moderation Test, Step Two .................................................................................................. 34
LIST OF FIGURES

Figure 2.1 Conceptual Framework ................................................................. 20
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBK</td>
<td>Central Bank of Kenya</td>
</tr>
<tr>
<td>CBR</td>
<td>Central Bank Rate</td>
</tr>
<tr>
<td>GDP</td>
<td>Growth Domestic Product</td>
</tr>
<tr>
<td>GMM</td>
<td>Generalized Method of Moment</td>
</tr>
<tr>
<td>NPLs</td>
<td>Non-performing Loans</td>
</tr>
<tr>
<td>RMP</td>
<td>Relative Market Power</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SACCO</td>
<td>Savings and Credit Co-operative</td>
</tr>
<tr>
<td>SCP</td>
<td>Structure Conduct Performance</td>
</tr>
<tr>
<td>SSA</td>
<td>Sub-Saharan Africa</td>
</tr>
</tbody>
</table>
OPERATIONAL DEFINITION OF TERMS

**Bank Size**
Total assets or total deposits of a bank for a particular period of time. The log of total assets is going to be utilized in measuring bank size.

**Capital Adequacy**
Minimum capital requirements as stipulated and advocated by the Central Bank. Core capital to total deposits will be utilized in assessing the capital adequacy in this study.

**Financial Intermediation**
Function of banks of transferring money to sectors that are lacking from those with excess for purposes of investment and/or consumption.

**Firm Characteristics**
Specific factors that are peculiar to the bank and within the control of the management of banks.

**Interest rate**
Amount of interest charged by apex bank for loans to other banks. The Central bank rate will be used as a measure for this rate.

**Liquidity**
Banks’ capacity to address their short-term finances when they are due for payment. The study will use the liquid assets to total assets in assessing the liquidity of banks.

**Non-performing Loans**
Loans that for a comparatively long-time period don’t yield income; thus, the interest or principal for such loans has not been paid for minimum of 90 days at least.
ABSTRACT

Banking in Kenya and the financial services in general have been identified as a pillar to achieving Vision 2030. Banking facilitates macro-economic steadiness for long-term development which will transform Kenya to a middle economy country. The growing level of nonperforming loans among Kenyan banks has been a source of concern to all stakeholders. This research ascertained the impacts of firms-characteristics on nonperforming loans of Kenya’s banks. The specific objectives were to assess the effect on liquidity, capital adequacy and bank size on non performing loans of Kenyan banks. In addition, the research examined the moderating impact of interest rate on the association between firms’ characteristics and non-performing loans of Kenyan banks. The research relied on market power, agency, and liquidity preference and capital buffer theories. Causal design was utilized in this research. The entire number of banks fully operational from 2013 to 2017 is 40 in number. The study used a census approach. Secondary data was gathered from the audited financials of these banks. Diagnostics tests were done for multicollinearity, stationarity and hausman. Data analysis was done based on descriptive analysis and panel regression analysis. Ethical standards and principles were followed to the end in the course of the research. The findings from the panel regression analysis indicated that capital adequacy had a significant effect on non performing loans of commercial banks in Kenya. Bank size had a significant effect on non performing loans of commercial banks in Kenya. Liquidity had insignificant effect on non performing loans of commercial banks in Kenya. Additionally, the study findings revealed that interest rate had no significant effect on the relationship between firm characteristics and non performing loans of commercial banks in Kenya. The study recommends that bank managers should be cautious when granting loans to customers by scrutinizing each application for credit regardless of the levels of liquidity held by banks. The study recommends that banks with larger assets can consider other investment options to diversify against the effect of high loan defaults. Further research can therefore be done to carry out further probe of the effect of liquidity on non performing loans of commercial banks. Additionally, further studies can be carried out on Micro Finance institutions and SACCO for comparison purposes.
CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Banks are important due to the roles which they perform in the economic resources allotment in countries. This boosts further investment and spurs economic expansion. The intermediation responsibility that is executed by banks of linking the surplus spending agents with the deficit spending agents in however hinge on bank loans. By implications, commercial banks intermediation role is affected by the level of NPLs (Ongore & Kusa, 2013; Soyemi, Akinpelu & Agunleye, 2013).

Non performing loans are regarded as loans that exceed ninety days hence are past their due or not generating interest any longer (Edson, Joseph, Clifford, Manuere & Michael, 2012). Demirgunes (2016) opine that non-performing loan that is already defaulted or closed to being defaulted. They further explained that if the loan’s interest and principal payment is unsettled by ninety days, it may be regarded as nonperforming loan. The NPLs are used as an pointer for financial steadiness and particularly banking system stability (Prasana, 2014). Hammami and Ouhibi (2015) indicated that NPLs is a lead on asset quality, risk on credit and effectiveness in the allotment of resource to prolific sectors.

The global financial crisis has proved and revealed that external funding sources can induce macroeconomic instability. Consequently, as indicated by Ouhibi and Hammami (2015) there are potential risks of financial system susceptibility in the economy. Mostly, the levels of NPLs in the banking sector is what is used in the evaluation of financial vulnerability. Notably when loans are issued, unfortunately a number of these loans turn into default thereby becoming non-performing which subsequently lead to bad debts which usually have detrimental impacts
regarding banks overall performance (Hue, 2015). Non-performing loans has become an increasing problem over the years which is threatening banks sustainability (Alizadeh & Junaina, 2011). The causes of these non-performing are often non-uniform and multidimensional in literature. Non-performing loans therefore bring about misery to lenders due to the fact that a bank that is having too much of it reflected on its balance sheet can have its operations adversely affected as regarding its profits, liquidity, debt- servicing capacity, ability to generate additional bank income and lending capacity (Demirgunes, 2016). The increasing trend of nonperforming loans in Kenya is a source of concern because banks largely depend on lending activities for their sustainability and increasing levels of NPLs precedes collapses of banks.

The relationship between NPLs and firm characteristics stem from the notion that the levels of NPLs is affected by the state of affairs in banks which is indicated by their specific characteristic. The increasing levels of NPLs in the context of Kenya have been worrisome which is due to the fact the banks depend on lending activities for their sustainability.

1.1.1 Firm Characteristics

These are internal bank factors that are peculiar to a bank and vary from one bank to another. The management of banks has some level of control/influence over these factors (Prasanna, 2014). Firm characteristics are factors that are easily controlled by the bank executive. Firm factors comprise liquidity, capital sufficiency and size. Liquidity entails the banks’ capacity to address their financial dues as they become due especially short term obligations such as that of depositors. In assessing liquidity of banks, Ongore and Kusa (2013) recommend liquid assets to total assets ratio. Banks that possess a reduced liquid assets level are prone to the uncertainty of being unable to finance their daily transactions. Various financial ratios are used to indicate
banks’ liquidity position, among these ratios are total loans/ customer deposits, customer deposits/total asset, liquid assets/total deposits and cash/deposit (Nyanga, 2012).

Capital adequacy exhibits the stipulated capital level required to be kept by commercial banks as indicated by the Central Bank. Capital sufficiency enables banks cushion against fundamental risks including market, credit and operational risks so as to protect debtors and absorb losses that arise (Klein, 2013). The capital of banks indicates the volume of own finances that are available which can be used in carrying out the banks’ business. The capital of banks acts as a shield in scenarios where negative circumstances happen in the bank (Abera, 2012). The probability of distress within the financial sector is reduced in the presence of good capital levels. Core capital to entire deposits will be utilised to ascertain the capital sufficiency of banks in the ongoing research.

Bank size is often utilized to ascertain the relative proportion of a market controlled by a bank and its relative market power therein (Nkusu, 2011). The issue of size of bank remains crucial in ensuring the stability of financial systems and that of the economy at large; therefore, it’s always a subject of debate among practitioners and policy makers. The 2007/2008 global financial turmoil led to the prominence of the debate on bank size. The crises revealed that large proportion of damage to the economy was attributed to large banks as compared to their small and medium counterparts (Nzioki, 2011).

1.1.2 Non performing Loans

NPLs are seen as those loans which for a comparatively long period don’t yield income; hence the principal or interest for such loans are yet to be received for minimum of 90 days at least.
NPLs can come about when the amortization schedules are not realized as at the due date which result in bloated loan interest due for payments (Badar & Atiya, 2013). Non-Performing Loans decreases bank liquidity, credit expansion, hampers the expansion of the real sector that directly impacts on banking performances in default and as well as the entire economy at large (Klein, 2013).

NPLs in the banking industry are seen as an evident mirror image of a failing or unprofitable business entity. This assertion implies that, the elimination of NPLs is a vital requirement to enhancing the fiscal status of banks. A situation where the banks’ NPLs are rolled over continuously, firms’ resource become confined in sectors that are not profitable which subsequently hold back and impair the expansion and efficiency of the economy respectively (Ali, 2012). The level of none performing loans is viewed as one of the key causes of bank failures and stagnation of the economy (Nkusu, 2011).

High levels of NPLs lowers banks liquidity and as well as their ability for credit expansion. In 2017, World Bank disclosed a surge in NPL level in Kenyan banks. The disclosed figures were 4.4 percent in 2011 and 4.6 percent in 2012. The surge continued between 2012 and 2015 to reach 11.7 percent in 2016. This has however raised high concerns from different stakeholders which are owing to the fact that bank profits and sustainability is directly dependent on loans issued to borrowers.

1.2 Statement of the Problem

The stability of financial institutions is imperative in stimulation of economic development and, domestic and foreign investment, poverty lessening and employment creation (Ali, 2012).
Banking in Kenya and the financial services in general has been identified as a success pillar to achieving 2030 Vision making Kenya a middle economy country by providing a facilitating macro-economic stability for long term development. The growing level of NPLs among Kenyan banks has been a source of concern to all stakeholders. This is because NPLs makes a setback for the banks’ balance-sheet on asset side, and have a setback on the income-statement as due to provisions for loans losses.

Various works have been conducted focusing on firm characteristics and their relationships with NPLs. Some of the findings of these studies include those of Adebola et al., who reported that capitals have inverse effect on Islamic banks NPLs. Dimitrios et al., (2011), Hassana et al.(2015) indicated that the bank capital and liquidity considerably affect the non-performing loans level of Greek bank. Messai and Jouini (2013) reported that liquidity of banks has effects on non-performing loans Greece, Spain and Italy. Makri et al., (2014) indicated that liquidity of banks has positive effects on NPLs. Warue (2013) reveal that liquidity significantly affects banks none performing loans in Kenya. Awour (2015) focused on bank specifics and NPL and found out that liquidity has a positive relationship on NPLs. These studies are however characterized by various research gaps.

Several studies (Awour (2015), Makri et al., (2014), Warue (2013) and Dimitrios et al., (2011)) have obtained conflicting results in the effect of firms-characteristic on NPLs. This could be due to country specific macroeconomic back ground and therefore the outcome of these studies can’t be directly adopted to the Kenyan background. This research seeks to seal these research gaps and add to research by ascertaining the effect of firm characteristic on NPLs and in addition
ascertain the moderating impact of interest rate on linkage between characteristic of firm with NPLs of commercial banks in Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

The research assessed the effect of firms’ characteristics on non-performing loans of Commercial Banks in Kenya.

1.3.2 Specific Objectives

The research’s specific aims are:

i) To ascertain the effect of liquidity on non-performing loans of commercial banks in Kenya.

ii) To examine the effect of capital adequacy on non-performing loans of commercial banks in Kenya.

iii) To evaluate the effect of bank size on non-performing loans of commercial banks in Kenya.

iv) To establish the moderating effect of interest rate on the relationship between firm characteristics and non-performing loans of commercial banks in Kenya.

1.4 Research Hypotheses

The hypotheses are:
H₀₁: Liquidity has no significant effect on non-performing loans of commercial banks in Kenya.

H₀₂: Capital adequacy has no significant effect on non-performing loans of commercial banks in Kenya.

H₀₃: Bank size has no significant effect on non-performing loans of commercial banks in Kenya.

H₀₄: Interest rate has no significant moderating effect on the relationship between firms’ characteristics and non-performing loans of commercial banks in Kenya.

1.5 Significance of the Study

The ongoing study is going to be of key importance to the executive of banking institutions and as well as other financial bodies. It is going to give them more insight on the firm characteristics and how the level of bank NPLs is predicted by these factors. This will be done by providing statistical substantiation of the linkage between firm characteristics and nonperforming loans. The policy-formulators will also find this examination resourceful because it will furnish them with various policy suggestions within the concepts of the research. The study will also be resourceful to the academic environment. The study will lay foundations for further investigations by researchers who desire to do detailed study in this subject area.

1.6 Scope of the Study

Banks registered by the CBK and operating in Kenya were centered on in the research, thus making it the contextual scope. The period 2013 to 2017 were covered in the study, thus making it the time scope. The conceptual scope of the study will be liquidity, capital adequacy, size,
interest rate and NPLs. The choice of these variables is informed by the various discrepancies of previous findings in respect to the variables. Panel regression is going to be utilised in the anticipated study. The study had a response rate of 90 percent as only thirty six (36) out of the forty (40) banks in Kenya were considered.

1.7 Limitations of the Study

The research faced various limitations. One was from the study data, some of the data were not in yearly form as initially proposed. This was addressed by findings the average of such data. another issue was that some two banks were liquidated which interfered with data collection.

1.8 Organisation of the Study

The research is made up of various sections and subsections. The first section contains the background, aims of the research and problem. The subsequent chapter consists of the evaluation of various studies and theories in relations to the subject matter that is firm characteristics and non-performing loans. The third chapter contains the ways, processes and procedures of data collection, measurements and analysis that are research methodology. The analysis of study data was presented in chapter four with the summary, conclusion and recommendations for policy were presented in chapter five.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The current chapter encompasses the assessment of literature which encompasses both theoretical and empirical. The study also contains the summary of literature review and research gaps of the previous studies reviewed, and concept model which provides the link of the examination concepts.

2.2 Theoretical Literature Review

This part contains the review of theories. Market Power Theory, Agency Theory, Capital Buffer Theory and Liquidity Preference Theory were used in this study. The relationship between the study variables is supported by these theories.

2.2.1 Theory of Market Power

This preposition was brought forth in 1965 by Bhagwati. The theory posits two approaches to be associated with the Market Power which are the Relative Market Power (RMP) and Structure Conduct Performance (SCP) hypotheses. The SCP hypothesis is based on the link between firm conduct market structure, and performance. As put forward by Baye (2010), an industry structure may include concentration, technology and market conditions, Conduct entails various attributes which include advertising decisions, pricing decisions and decisions regarding research and development (R&D) undertaken by firms in a market.
Berger (1995) posits that entry barriers into an industry benefits banks as higher entry costs influence a firm’s profitability in that higher costs of entry ensures that already existing firms keep hold of market share and thus monopoly profits since new firms will shrink this market share and subsequently profits. Market concentration leads to reduction in the collusion costs between already existing banks thereby leading to larger market share. As indicated by Shipho and Olweny (2011) banks functioning in a more intense market can collude and sometimes have higher rates of interest on loans while paying on deposits the rates that are lower as compared to those banks which operate in less concentrated market irrespective of their efficiency.

The Relative Market Power (RMP) hypothesis, conversely, proposes that large banks are the only ones having variety and differentiated products and services can dictate prices and improve profitability. Large banks exercise market power which enables them have control of the market by having large number of customers whereas small banks possess smaller market shares which depicts a perfect competition and unable to enjoy such advantages (Olweny & Shipho, 2011; Berger, 1995). Market Power Theory therefore supports the link between bank size and NPLs.

2.2.2 Agency Theory

This idea was introduced by Meckling and Jensen (1976). This idea is well rooted in economic concepts and has its dominance in corporate governance literature. As put forward by Daily, Dalton and Canella (2003), two key points led to the eminence of this presumption. First is the notion that the theory and its prepositions are conceptually simple as they reduce the corporation into 2 foremost players that is executives and shareholders. The second point is the notion outlined by the theory of human beings being self-interested which generally is an accepted idea.
In line with this notion, managers who are agents may put their various interests above that of their masters.

Agency Theory provides vivid explanations on the agency problems emanating as a result of an agent negating the interest of his principal and not acting in his best interest. In the perspective of banks which is the case of this research, managers or management may not carry out their roles consistently with the various interests of the shareholders (who are the principal) who desire and demand the wealth maximization of shareholders be given key consideration. Managers however, may sometimes carry out activities that will best serve their own interests. Managers are obligated to be efficient in their dealings which are also reflected in the banks’ quality of asset that is level of NPLs.

In the context of firms, agency relationships therefore explain the association existing among the providers of between corporate financiers and the managers assigned to carry out the affairs of firm management. As viewed by Meckling and Jensen (1976) agency relationship entails “an agreement that one or more parties (that is the principal approach another party (which is the agent) for purposes of performing some stipulated services on their behalf which includes the delegation of various tasks to the agent”. Therefore the theory, advocates for the concentration and delegation of control of the organization.

2.2.3 Capital Buffer Theory

Rob and Calem were the formulators of this presumption in 1996. The presumption is driven by the idea that banks have a propensity to increase capital when they achieve the least requirement of capital as regulated, the aim of which is to be safe from costs that come as a result of the
violation of the stipulated capital levels. Rob and Calem(1999) explains that penalties and fines are always the result of a breach in the provisions of the regulations. Due to this, banks are inclined to hold capital that is in excess of the stipulated limit, the aim of which is to reduce the chances of not meeting the capital requirements. A u-shaped connection informs the risk taking and capital in the case of banks. Banks whose capitalization is lower have a propensity to take big risks under an expectation that the costs of bankruptcy can be passed over to an insurance company. Contrary, banks whose capitalization is adequate are inclined towards investing in portfolios that are risky under the expectation that the profitability will be high the aim of which is to utilize them for continuous improvement of its capitalization (Rime, 2001).

Heider and Gropp(2009) opines that buffer capital executes a range of functions including promotional, protective, regulatory and operational. Promotional draws from the bank activities that are geared towards sustaining a substantial capital for expansion and meeting stakeholder’s expectations. This protective function is exhibited through the capacity to protect against unforeseen losses while making sure that there is continuity and reliability of business. As opined by Volkov (2010), executives make sure that the capital being held is substantial and shield from costs that arises out of a violation of a requirement. Operational function draws from the enhancement of bank’s activities that brings profits.

2.2.4 Liquidity Preference Theory

Liquidity Preference perspective was introduced by Keynes (1936). It is premised on supposition that organizations have a desire to hold money for various motives the way individuals do. Liquidity covers any asset that can be converted to cash at ease and money is more liquid than
other assets. Banks trade with liquid assets whose demand among the investors is occasional. When a liquid asset is not held for a given period a regard given is interest rate usually calculated through supply and demand for money. As stated by Keynes, money demand has three classifications based on motives; the transactional motive is driven by the need to hold cash for transacting purposes like for paying transport, salaries among others. Precautionary motive rests on the notion that cash is held for the purpose of catering for unforeseen things like illness or accidents. The, speculative reason is based on the desire to hold cash to meet future changes like exercising the right is buying stock. With a surge in price of stock, the rate of interest is anticipated to decline prompting investors to buy and anticipate for prices to rise. The amount of money in a country is called the money supply (Keynes 1936).

Investors are characterized by varied preference for liquidity with some having preference for assets that are not liquid. If an asset is more illiquid, the rate of interest will be more. Political flux in a country tends to affect the banks liquidity as evidenced by the 2008 violence after the elections. In such a scenario, investors withdrew cash from banks (Klein, 2013). The supposition of this concept gives theoretical reinforcement to the link between liquidity and non-performing loans. Banks with excess liquidity levels give out more loans to customers; this is with the aim of having high profitability. However, these banks are subsequently likely to have high levels of non-performing loans.

2.3 Empirical Review

The review of past literature is contained in the current section. The section further contains the critic of past empirical works where the various research gaps are outlined which serve as justification for the current research.
Hue (2015) did a research on the key factors contributing to NPLs for Vietnam’s banking system. The study focused on the period spanning from 2009-2012. An OLS method for panel data became applicable in analysing the connection between the NPLs and various bank characteristics. The research was built on regression analysis with the outcomes revealing that bank size significantly contribute to the banks’ NPLs level. The examination was focusing on Vietnam and this ongoing research is on Kenya’s banks.

Hassana, Rehman and Ilyas (2015) did an analysis on bank-specific and NPLs in Pakistan. A survey questionnaire was utilised in this research. The results displayed a strong impact by various bank-explicit factors like credit assessment, bank size capital adequacy, monitoring of credit and speedy credit expansion on NPLs, but interest and liquidity had a weak significance on NPLs. The conclusion from the research was that capital sufficiency and bank size have a considerable impact on levels of NPLs. The research however was based on questionnaire which can be subjective in nature as compared to quantitative data which was used in this study. Furthermore, the analysis was centered on Pakistan whereas this study is going to be focusing on Kenyan banks.

Ouhibi and Hammami (2015) analysed the factors determining the soundness of the system of banking in terms of finance among South Mediterranean nations. 6 countries among the 10 were sampled and these are; Turkey, Tunisia, Egypt, Jordan, Lebanon and Morocco. An OLS method was utilised on a panel regression on the yearly frequency from 2000 - 2012. The outcomes disclose that firm characteristics significantly impact on banks’ nonperforming loans.

Awuor (2015) in the context of Kenya carried out a study which was based on secondary data collected from banks for a period of five years (2010 to 2014). The data was on levels of bank
NPLs and bank specific characteristics notably, asset quality, operational cost efficiency, earnings capacity, liquidity and bank size. The research used multiple regression analysis. The study findings indicate that 15.6 percent of variations in bank NPL levels is explained by variations in the bank specific characteristics. Specifically, there is a negative relationship between bank size, asset quality and levels of bank NPLs. There is also a positive connection between liquidity, operational cost efficiency, earnings ability and levels of NPLs. Unlike this study, the progress research is going to be hinged on panel regression analysis with the moderating impact of interest rate on the connection of firm-characteristic and NPLs of Kenyan banks is going to be established.

A research enquiry was undertaken by Prasanna (2014) on what determines NPLs in the context of India. Yearly panel data was used premised on a dataset of thirty one Indian banks. It relied on the period of 2000 to 2012. The research findings revealed that per capita income alongside savings have momentous impact on NPLs. The research however, ignored interest rate and its moderating impact on the connection between firm characteristic and nonperforming loans.

Makri et al., (2014) did an investigation on the factors predicting the NPLs levels for Eurozone’s banking sector where 2000-2008 was the period under consideration. A dynamic panel regression method for our examination specially, a GMM was utilised. The research findings revealed a significant linkage of firm characteristic and NPL levels. The research specifically indicated significant consequence of liquidity on the levels of banks’ NPLs in Eurozone. The study was thus premised on banks’ in Eurozone unlike this enquiry which was on the Kenyan banking sector.

Warue (2013) carried out a research on the connection between NPL and bank-specifics and macro-economic factors, and scrutinize the level at which they determine the happening of
banks’ NPLs. The research covers the period 1995-2009 utilising both secondary and primary data. Principally, a census of forty four Kenyan banks was taken. The study reveals that capital adequacy significantly affects banks nonperforming loans. Liquidity however had insignificant effect on non performing loans of commercial banks. However, the moderating influence of interest rate on the association between liquidity and NPL wasn’t analyzed.

Jouini and Messai (2013) scrutinized on the factors influential to the nonperforming loans of banks. The examination covered on 85 banks for three countries (Spain, Greece and Italy) while focusing on the years 2004 to 2008. A method of panel data was utilised on the following variables the rate of growth of GDP, liquidity, unemployment rate and real interest rate. The outcomes disclosed that liquidity of banks has negative effects on loans that are not performing. The study however was centered on developed nations (Greece, Spain and Italy) unlike this study which will be on a developing country (Kenya). Countries are characterized by varying economic conditions.

Dimitrios, Angelos and Vasilios (2011) did an empirical investigation on the various determinants of Greek banks NPLs. The analysis was based on a panel data of the 9 biggest Greek banks. Data was utilised for 2003 to 2009 where the generalized method of moment was applied. Data analysis was carried out on different models for the various categories of loans (such as business loans, consumer loans and that of mortgages). Research findings indicated that the bank capital, bank size and liquidity significantly affect the NPLs level of Greek bank. The study however was based on Greek banks. It is therefore, not applicable to the Kenyan context, as regulations differ from country to country. In sealing the background gap, the ongoing research focused on Kenyan banks that are commercial.
Yusoff, Dahlan and Adebola (2011) conducted a study in Malaysia on the various determinant of banks non-performing loans. Research findings showed capital adequacy has a negative effect on Islamic banks non-performing loans. The study however, was set up on Malaysian Islamic banks; hence the deductions cannot be directly pertinent to that of Kenyan banks which is the premise of current research. The underlying regulations for Islamic banks vary from those of commercial banks.

2.4 Summary of Literature Review and Research Gaps

This section contains the appraisal of empirical literature and gaps outline therein and the research gaps filled.

Table 2.1: Summary of Literature Review and Research Gaps

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Key Focus</th>
<th>Results</th>
<th>Gaps and Focus of the current study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adebola, Yusoff and Dahlan (2011)</td>
<td>Determinants of banks nonperforming loans in Malaysia</td>
<td>Strong correlation between NPL and various macroeconomic and bank specific factors. Liquidity is positively related to NPL</td>
<td>The study however, focused on both macro and bank specific factors on Islamic banks in Malaysia. This study focused on firm characteristic in Kenyan banks.</td>
</tr>
<tr>
<td>Angelos, Dimitrios, and Vasilios (2011)</td>
<td>What determines Greek banks’ NPLs</td>
<td>Research findings indicated that the bank</td>
<td>The research was anchored on Greek</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Findings</td>
<td>Notes</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Jouini and Messai</td>
<td>Factors determining the banks’ NPL in Greece, Italy and Spain</td>
<td>The results show that liquidity of banks have negative effects on NPLs</td>
<td>Focused on developed nations (Greece, Spain and Italy) unlike this study</td>
</tr>
<tr>
<td>Warue (2013)</td>
<td>Association between NPLs and bank-explicit and macroeconomic factors</td>
<td>The study reveals that bank characteristics significantly affects banks non-performing loans in Kenya.</td>
<td>The examination ignored moderating characteristics and how they impact on the linkages between firm characteristics and non-performing loans</td>
</tr>
<tr>
<td>Makri (2014)</td>
<td>Linkage between macro &amp; micro factors and nonperforming loans for Eurozone banking sector.</td>
<td>Positive and significant linkages among NPLs and liquidity.</td>
<td>The study used both macro and micro variables whereas the based on micro variables only.</td>
</tr>
<tr>
<td>Awuor (2015)</td>
<td>Relationship between bank specific and non-performing loans on Kenyan Commercial</td>
<td>The study revealed a positive relationship between liquidity, operational efficiency</td>
<td>There was no moderating factor.</td>
</tr>
</tbody>
</table>
and nonperforming loans. Whereas bank size and asset quality had a negative effect.

| Ouhibi and Hammami (2015) | Determinant of financial soundness indicators (NPLs) of the banking system in the southern Mediterranean’s countries | The study revealed that firm characteristic significantly impacts on non-performing loans | The study was carried out outside Kenya and did not consider moderating variable. |

**Source: Researcher, 2019**

A number of the studies were done relating to firm characteristics and non-performing loans. These researches were however having gaps. Most of the studies focused on both macroeconomic and bank specifics and others were done for other countries other than Kenya. Due to the contextual differences such as economic conditions, regulatory frameworks of nations, the outcomes for such researches can’t be extended to the Kenyan banks. Also, they didn’t factor the moderating effects of interest rate and how they affect the relationship between firm characteristics and NPLs.

**2.5 Conceptual Framework**

The conceptual structure shows the linkage between the variables in visual form. The model depicts liquidity, capital adequacy; bank size (firm characteristics) as the predictor variables even as nonperforming loans serves as the outcome variable. Interest rate (CBR) being the moderating
variable is expected to impact the linkage existing between firm characteristic and NPL.

**Figure 2.1: Conceptual Framework**

**Source:** Researcher (2019)
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

The current chapter encompasses the methodology that was utilized in the study. These methodologies were research design, empirical model, target population, sampling, collection of data, analysis of data and its presentation and ethical considerations.

3.2 Research Design

Research design provides a road map to be followed in a research study (Schindler and Cooper, 2009). The various research processes are guided by the study design adopted in a study. Causal design was used in the ongoing research. This research design is utilized in investigations which aim at assessing the effect of various variables on outcome variables. Causal research design will be best for this enquiry as it seeks to evaluate the cause and effect connection between firm characteristics and nonperforming loans.

3.3 Target Population

Population in the context of this research refers to the total number of firms of interest to the researcher. The study’s population of interest is Kenyan banks. The entire number of banks fully operational 2013 to 2017 is 40 in number. The whole population was studied because the population was small.

3.4 Empirical Model
The research will adopt a panel model regression anchored on a panel data. The model is exhibited as:

\[ NPL_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 CAP_{it} + \beta_3 BS_{it} + \epsilon_{it} \]

Where:

- \( NPL_{it} \) – Non-performing Loans
- \( \beta_0 \) - Constant
- \( LIQ_{it} \) – Liquidity
- \( CAP_{it} \) – Capital Adequacy
- \( BS_{it} \) – Bank Size
- \( \beta_1 \) – \( \beta_3 \)= Regression coefficients
- \( \epsilon_{it} \)= Error term

**Test For Moderation**

\[ NPL_{it} = \beta_0 + \beta_1 FC_{it} + \beta_2 INT_{it} + \epsilon_{it} \] \( 3.2 \)

\[ NPL_{it} = \beta_0 + \beta_1 FC_{it} + \beta_2 INT_{it} + \beta_3 INT \ast FC_{it} + \epsilon_{it} \] \( 3.3 \)

Where

- \( NPL_{it} \)= Non-performing Loans
- \( FC \)= Firm Characteristics
- \( INT_{it} \)= Interest rate (Moderating variable)
- \( \ast \)=Interaction-term
- \( \beta_2, \beta_3, \& \beta_1 \)= Beta Coefficients
3.5 Operationalisation and Measurement of Variables

Table 3.1: Operationalisation and Measurement of Research Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Operationalisation</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-performing Loans</td>
<td>Dependent</td>
<td>Ratio of Nonperforming Loans to Entire Loans</td>
<td>• NPL Ratio</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td>Independent</td>
<td>Capacity to address short term financial obligations</td>
<td>• Liquid asset to total asset</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Adequacy</td>
<td>Independent</td>
<td>Requirements for minimum capital</td>
<td>• Core capital to total assets</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank Size</td>
<td>Independent</td>
<td>Bank assets</td>
<td>• Logs of assets</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Rate</td>
<td>Moderating</td>
<td>Central bank rate</td>
<td>• CBR (%)</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.6 Sampling Design

Sampling entails the choice of a subset of a research populace. The forty banks fully operational in Kenya between 2013 to 2017 formed the research sample. Thus, meaning the
examination will be a census study as it considers all the Kenyan banks that are commercial in nature.

3.7 Data Collection

The research utilised secondary panel data spanning from the years 2013 - 2017. Banks financial statements and CBK statistical bulletins were used to extract research data. Data collection guide was therefore utilised.

3.8 Data Analysis and Presentation

Data analysis encompass the conversion of information gathered for research into usable form usually for purpose of coming up with conclusions. The analysis of study data is going to be done after the collection of data. Data analysis is carried out to transform collected data into usable format for purposes of interpretations and conclusion. Inferential and descriptive scrutiny is going to be undertaken. The use of means and standard deviations were employed in the descriptive analysis while the inferential analysis was based on panel regression technique.

The study utilized panel data; as such the inferential analysis is premised on panel regression. There panel regression technique therefore was used to test hypotheses and conclusions made thereafter. The regression analysis was based on two models, that is the direct effect model and moderation effect model. The test of hypotheses was guided by 0.05 significance level, that is 95% confidence interval. Various diagnostic tests relating to panel regression analysis will be undertaken to guarantee that the research data to be used is enough in form before
analysis. Diagnostic tests for multicollinearity, heteroscedasticity and normality are going to be done.

3.9 Diagnostic Tests

3.9.1 Multicollinearity Test

Wooldridge (2013) explains it as a scenario where predictor variables in a research have level of association. Extreme degree of multicollinearity brings about incorrect estimates as it raises the Pvalues; in ascertaining the degree of association between the independent variables, the correlation matrix was used in line with Greene (2008). The test was therefore guided by a threshold 0.8 or -0.8. In case of a severe multicollinearity established, the variable affected was eliminated.

3.9.2 Stationarity Test

In carrying out panel regression, the expectation is that the research data set is stationary (Verbeek, 2012). This was largely due to the time series aspect of the data. The presence unit root leads to wrong inferences and ultimately wrong conclusions. The study tested for stationarity with the use of Hadri LM Test. The null hypotheses stated that all panels are stationary. In the case of non-stationary, the differentiation of such variables was done.

3.9.4 Hausman Test

Hausman test was used for the selection of the model (fixed or random) to be used for estimation in analysis. The hausmann test is premised on a null hypothesis of the random effect being the chosen model and the alternative being the fixed effect. The test was guided by a (0.05) percent level of significance. Therefore, a probability value lower than 0.05 discloses that null hypothesis is to be rejected meaning that the model to be utilized is the
fixed effect. Conversely, a probability value above 0.05 means that the random effect is the best model therefore the null hypothesis is not rejected.

3.10 Ethical Consideration

The study observed the various ethical considerations pertaining research in Kenyatta University and Kenya in general. This spans from prevention of fabrication and plagiarism. Authors whose researches are used in the study were duly accredited by citing them.
CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This part comprises of the data analysis, presentation and interpretation. The data analysis of the study is based on descriptive analysis, diagnostic tests and regression methods. The interpretation of the regression outcome is further carried out with comparisons with previous studies while providing possible reasons for the results obtained.

4.2 Descriptive Analysis

The descriptive analysis of the study sought to provide the basic features of the study variables. It presents statistics such as standard deviation, mean, minimum and maximum number of observation and as well as the total number of observation. These statistics aid in providing more understanding of the research variables. The descriptive statistics are therefore presented in Table 4.1.

Table 4.1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPL</td>
<td>180</td>
<td>3.25</td>
<td>0.70</td>
<td>1.04</td>
<td>4.53</td>
</tr>
<tr>
<td>Liquidity</td>
<td>180</td>
<td>0.18</td>
<td>0.16</td>
<td>0.03</td>
<td>0.59</td>
</tr>
<tr>
<td>Capital Adequacy</td>
<td>180</td>
<td>0.15</td>
<td>0.05</td>
<td>0.03</td>
<td>0.38</td>
</tr>
<tr>
<td>Bank Size</td>
<td>180</td>
<td>4.64</td>
<td>0.56</td>
<td>3.57</td>
<td>5.74</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>180</td>
<td>9.70</td>
<td>1.13</td>
<td>8.50</td>
<td>11.50</td>
</tr>
</tbody>
</table>

Source: Research Findings, 2019

Table 4.1 presents the descriptive statistics of the study which were based on descriptive analysis. All the research variables namely NPLs, liquidity, capitals, size and interest rate had
a total number of observations of 180 each. Non performing loans had 3.25 as mean and a corresponding standard deviation of 0.70. This therefore is an indication that non performing loans over the study period had been highly volatile. Also, non performing loans had a minimum and maximum value of 1.04 and 4.53 respectively. Liquidity of commercial banks had a mean value of 0.18 and a standard deviation of 0.16. As such, liquidity had been relatively stable over the years. This is therefore indicates the liquidity regulation by the Central Bank of Kenya has been efficient over the years as evidenced by minimal fluctuation.

Capital adequacy is reported to have a mean and standard deviation of 0.15 and 0.05 respectively. The implication of these statistics is that capital adequacy relatively fluctuated with the period of the study. The minimum and maximum values were 0.03 and 0.38 respective which imply that the movements in capital adequacy of commercial were within a small range. Bank size had a mean of 4.64 and a standard deviation of 0.56 which indicates that the size of commercial banks had some fluctuations within the period of the study. The minimum and maximum values of bank size were 3.57 and 5.74 respectively. Interest rate had a mean of 9.70 and a standard deviation of 1.13, thus, implying that interest rate had been characterized by minimal fluctuation over the study period. The minimum and maximum values were 8.50 and 11.50.

4.3 Diagnostic Tests

This section presents the various diagnostic tests that were carried out in the study. The diagnostic tests were test for multicollinearity, stationarity and normality tests. Hausman test was further carried out for purposes of selecting the best panel regression model for estimation.
4.3.1 Multicollinearity

Multicollinearity is considered as the scenario where the independent variables are highly correlated. To assess the multicollinearity levels of the predictor variables, the correlation matrix was therefore applied. Table 4.2 contains the output.

**Table 4.2: Correlation Matrix**

<table>
<thead>
<tr>
<th></th>
<th>Liquidity</th>
<th>Capital Adequacy</th>
<th>Bank Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidity</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Adequacy</td>
<td>0.2193</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>Bank Size</td>
<td>-0.1832</td>
<td>-0.3245</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

*Source: Research Findings, 2019*

Table 4.2 depicts the study findings on the test for multicollinearity. The test was based on the correlation matrix in line with Greene (2008). The threshold for this test is 0.8 or -0.8. Notably, none of the correlation coefficients is beyond the threshold of 0.8. Therefore, the study variables did not suffer from severe multicollinearity level.

4.3.2 Stationarity Test

In carrying out a panel regression analysis, the data set is required to be stationary. The presence of a unit root leads to wrong inferences and ultimately wrong conclusions. The study tested for stationarity with the use of Hadri LM Test as indicated in Table 4.3.

**Table 4.3 Hadri LM Test for Unit Root**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Value 1</td>
<td>Value 2</td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>NPL</td>
<td>-1.0708</td>
<td>0.8579</td>
</tr>
<tr>
<td>Liquidity</td>
<td>-0.4978</td>
<td>0.6907</td>
</tr>
<tr>
<td>Capital Adequacy</td>
<td>-0.4384</td>
<td>0.6694</td>
</tr>
<tr>
<td>Bank Size</td>
<td>1.4601</td>
<td>0.0721</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>-1.0480</td>
<td>0.8527</td>
</tr>
</tbody>
</table>

Source: Research Findings, 2019

The null hypothesis for this test is that all the panels to be used are stationary. Non-performing loans had a p-value of 0.8579, liquidity had a p-value of 0.6907, capital adequacy had a p-value of 0.6694, bank size had a p-value of 0.0721 and interest rate had a p-value of 0.8527. The results indicated that the p-value for all the research variables where above the threshold of 0.05, therefore the study failed to reject the null hypothesis which stated that all the panels are stationary.

4.3.3 Hausman Test

The study carried out a hausman test so as to select the right model analysis purposes. Outcome is presented in Table 4.4.
Table 4.4 Hausman Test

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(b)</td>
<td>(B)</td>
<td>(b-B)</td>
<td>sqrt(diag(V_b-V_B))</td>
</tr>
<tr>
<td>Fixed</td>
<td>Random</td>
<td>Difference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td>.5686869</td>
<td>.504295</td>
<td>.0643919</td>
<td>.1474424</td>
</tr>
<tr>
<td>CapitalAde-y</td>
<td>1.952164</td>
<td>1.166989</td>
<td>.7851748</td>
<td>.</td>
</tr>
<tr>
<td>BankSize</td>
<td>1.993778</td>
<td>1.254875</td>
<td>.7389027</td>
<td>.1375611</td>
</tr>
</tbody>
</table>

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

\[
\text{chi2}(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
\]

= 18.69
Prob>chi2 = 0.0003

(V_b-V_B is not positive definite)

Source: Research Findings, 2019

The results from the hausman test indicated a p-value of 0.0003 obtained, which is notably below the threshold of 0.05. As such, the null hypothesis was rejected; therefore, the fixed effect model was utilized in the study.

4.4 Panel Regression Analysis

The study applied panel regression analysis which was based on direct effect model and moderation effect model.

4.4.1 Direct Effect Test

The direct effect test sought to establish the effect of firm characteristics on non performing loans of commercial banks in Kenya as contained in Table 4.5.
Table 4.5: Effect of Firm Characteristics on Non Performing Loans

|                                | Coef.    | Std. Err. | Z    | P>|z|   | [95% Conf. Interval] |
|--------------------------------|----------|-----------|------|-------|---------------------|
| Liquidity                      | .5686869 | .332315   | 1.71 | 0.089 | -.0883691 to .125743 |
| Capital Adequacy               | 1.952164 | .574014   | 3.40 | 0.001 | .8173762 to 3.086952 |
| Bank Size                      | 1.993778 | .180265   | 11.06| 0.000 | 1.637405 to 2.350151 |
| _cons                          | -6.383203| .849756   | -7.51| 0.000 | -8.063112 to -4.703293 |

R\(^2\) = 0.4808
F statistics = 43.52
Prob> chi2 = 0.0000

Source: Research Findings, 2019

Table 4.5 indicates that liquidity, capital adequacy and bank size are satisfactory in explaining the variations of non performing loans of commercial banks. This is further supported by R\(^2\) of 0.4808 which implies that liquidity, capital adequacy and bank size collectively explain the movements in non performing loans of commercial banks in Kenya. The findings in Table 4.6 further indicate that the overall model used is significant as evidenced by a p-value of 0.0000.

The coefficient of each of the variables provided various findings. Liquidity had a coefficient of 0.569 which implies that a unit increase in liquidity leads to a corresponding increase in non performing loans by 0.569. Similarly, capital adequacy positively influences the non performing loans of commercial banks. Furthermore, a unit increase in bank size leads to a corresponding 1.994 increase in non performing loans of commercial banks in Kenya, implying that bigger banks give out more credit and as such, higher NPLs.

4.4.2 Moderating Effect Test

The test for moderation effect was based on the approach by Whisman and McClelland (2015). The approach is based on two steps. The first step introduces the moderating variable...
as an explanatory variable. This is for purposes of ascertaining whether interest rate is an explanatory variable.

Table 4.6 Moderation Test, Step One

| NPL            | Coef.    | Std. Err. | Z    | P>|z| | [95% Conf. Interval] |
|----------------|----------|-----------|------|------|----------------------|
| Liquidity      | .5464239 | .3283985  | 1.66 | 0.098| -1.028375 - 1.195685 |
| Capital Adequacy | 1.763354 | .5737255  | 3.07 | 0.003| .6290682 - 2.89764   |
| Bank Size      | 1.745052 | .2126816  | 8.20 | 0.000| 1.324569 - 2.165535  |
| Interest Rate  | .0314389 | .014708   | 2.14 | 0.034| .0023604 - .0605174  |
| _cons          | -5.503476| .9346878  | -5.89| 0.000| -7.351404 - 3.655548 |

R² = 0.4972
F statistics = 34.61
Prob> chi2 = 0.0000

Source: Research Findings, 2019

The findings of the study in Table 4.6 indicate an R² of 0.4972. This therefore is an indication that the variables had strong explanatory power on NPLs. The findings indicate the firm characteristics and interest rates collectively explain 49.72% of the variations in NPLs. This is further supported by an F statistics of 34.61 and a p-value of 0.0000. Therefore implying that the model is significant.

The findings in Table 4.6 indicate that with all other variables held constant, interest rate had a significant effect on non performing loans of commercial banks in Kenya. The second step of the moderation test is however utilized to further confirm whether interest rate is simply an explanatory variable or whether it has a moderating effect on the relationship between firm characteristics and NPLs.
Table 4.7 Moderation Test, Step Two

|                        | Coef.    | Std. Err. | Z      | P>|z|  | [95% Conf. Interval] |
|------------------------|----------|-----------|--------|------|----------------------|
| Liquidity              | 0.9325437| 0.8577034 | 1.09   | 0.279| -0.7635058            |
| Capital Adequacy       | 2.296196 | 3.400893  | 0.68   | 0.501| -4.428836            |
| Bank Size              | 1.57992  | 3.277451  | 0.48   | 0.615| -0.0247306            |
| Interest Rate          | -0.033111| 0.133185  | -0.25  | 0.804| -0.2964642            |
| Interest Rate *Liquidity| -0.041565| 0.0825139 | -0.50  | 0.615| -0.2047306            |
| Interest Rate *Capital | -0.046154| 0.3426775 | -0.13  | 0.893| -0.7237757            |
| Interest Rate *Bank Size| 0.0169629| 0.0238928 | 0.71   | 0.479| -0.0302835            |
| _cons                  | -4.884904| 1.686485  | -2.90  | 0.004| -8.219813            |

R² = 0.5011
F statistics = 19.65
Prob> chi2 = 0.0000

Source: Research Findings, 2019

The step two for the moderation tests sought to assess whether interest rate has a moderating effect on the relationship between firm characteristics and non-performing loans of commercial banks in Kenya. In assessing the moderation effect of interest rate, each of the firm characteristics namely liquidity, capital adequacy and bank size was interacted with interest rate to ascertain the effect on non-performing loans of commercial banks in Kenya.

The second step of the moderation test therefore sought to establish whether the interaction of interest rate and each of the firm characteristics was significant in predicting non-performing loans of commercial banks in Kenya.

4.5 Hypothesis Testing

This section provides the various results on hypothesis tests. The various hypotheses were analyzed using panel regression based on 0.05 significance level. These were in line with the specific objectives of the study as contained in Table 4.5 to Table 4.7.
**H₀₁**: Liquidity has no significant effect on Non-performing Loans of Commercial Banks in Kenya.

The study sought to assess the effect of liquidity on non performing loans of commercial banks in Kenya. A corresponding null hypothesis which stated that liquidity has no significant effect on NPLs was formulated. The study findings indicated that liquidity had a p-value of 0.089 which is an indication of non significance. Therefore, liquidity had no significant effect on non performing loans of commercial banks in Kenya. The study therefore failed to reject the null hypothesis.

The study findings on the effect of liquidity on NPLs are largely in agreement with previous studies. Jouini and Messai (2013) researched on the factors influencing the nonperforming loans of banks. The outcome of the study revealed that liquidity of banks had weak effect on non performing loans. Awuor (2015) in the context of Kenya carried out a study on bank characteristics and non performing loans of commercial banks. The study found that liquidity had an insignificant effect on non performing loans of commercial banks. Hassana *et al.* (2015) did an analysis on bank-specific and NPLs in Pakistan and established that liquidity of banks was found to have an insignificant effect on non performing loans.

**H₀₂**: Capital Adequacy has no significant effect on Non-performing Loans of Commercial Banks in Kenya.

The second objective of the study was to establish the effect of capital adequacy on NPLs. In view of this specific objective, a null hypothesis was formulated which stated that capital adequacy has no significant effect on Non-performing Loans of Commercial Banks in Kenya. The findings of the study in Table 4.6 provided a p-value of 0.001 which is an indication of significance. The null hypothesis stated that capital adequacy has no significant effect on
Non-performing Loans of Commercial Banks in Kenya was therefore rejected at 0.05 significance level. The findings can be traced to the notion that banks with capital buffers may have an incentive to give out more loans and advances to customers/borrowers, thus increasing the levels of non performing loans of commercial banks.

The study findings concur with those of previous studies. Yusoff, Dahlan and Adebola (2011) conducted a study in Malaysia on the various determinant of banks non-performing loans. Research findings showed capital adequacy has a significant effect on Islamic banks non-performing loans. Dimitrios et al. (2011) in their study on the various determinants of Greek banks NPLs. The study indicated that bank capital significantly affects the NPLs level of Greek bank. The analysis was based on a panel data of 9 biggest Greek banks. Makri et al., (2014) did an investigation on the factors predicting the NPLs levels for Eurozone’s banking sector and found that capitals are having strong effect NPL levels.

Furthermore, Prasanna (2014) on what determines NPLs in the context of India. The research findings revealed that capitals had strong influences on NPLs in India. Ouhibi and Hammami (2015) while studying the factors determining the soundness of the system of banking in terms of finance among South Mediterranean nations reported that capital adequacy significantly impact on banks’ nonperforming loans. Hassana et al (2015) did an analysis on bank-specific and NPLs in Pakistan and found that capitals have strong influences on non performing loans.

**H03:** Bank Size has no significant effect on Non-performing Loans of Commercial Banks in Kenya.
The study further sought to assess the effect of bank size on non performing loans of commercial banks in Kenya. In line with this specific objective, a null hypothesis was formulated which stated that bank size has no strong effect on NPLS. The study findings in Table 4.6 reveal that bank size has a p-value of 0.000 which indicates significance at the threshold of 0.05. The study therefore failed to reject the null which stated that bank size has no significant effect on Non-performing Loans of Commercial Banks in Kenya. Large banks are able to get large deposits and therefore do more aggressive lending both at conventional and digital banking and be able to absorb more risk and therefore increasing the non performing loan levels of banks. On the other hand small banks obtain more expensive deposits and have less lendings.

The study findings on the effect of bank size on non performing loans of commercial banks are in agreement with the findings of Dimitrios et al. (2011), Makri et al., (2014), Awuor (2015), Ouhibi and Hammami (2015), Hassana et al. (2015) and Hue (2015). Dimitrios, Angelos and Vasili (2011) did an empirical investigation on the various determinants of Greek banks NPLs. The analysis was based on a panel data of the 9 biggest Greek banks. Research findings indicated bank sizes significantly affect the NPLs level of Greek bank.

Makri et al., (2014) in their study on the factors predicting the NPLs levels for Eurozone’s banking sector found a strong linkage among bank size and NPLs in Eurozone. Awuor (2015) in the context of Kenya reported a strong effect on size on loans. Ouhibi and Hammami (2015) analysed the factors determining the soundness of the system of banking in terms of finance among South Mediterranean nations. The study findings revealed that bank size significantly impact on banks’ nonperforming loans. Hassana et al. (2015) did an analysis on
bank-specific and NPLs in Pakistan. The study findings indicated that bank size has a considerable impact on levels of NPLs. Hue (2015) while focusing on factors contributing to NPLs in the context of Vietnam found that bank size significantly contributes to the banks’ NPLs level. The findings of the study that bank size has significant effect on non performing loans largely collaborate those of previous studies. This is because bank size forms a key component of banks as it reflects their total assets.

**H₀₄: Interest rate has no significant moderating effect on the relationship between firms’ characteristics and Non-performing Loans of Commercial Banks in Kenya.**

The study sought to test the null hypothesis which stated that interest rate had no significant moderating effect on the relationship between firm characteristics and non performing loans of commercial banks in Kenya. The hypothesis was further broken down into three null sub hypotheses for purposes of assessing the moderating effect of interest rate on the relationship between each of the firm characteristics and non performing loans of commercial banks in Kenya.

The first null sub hypothesis stated that interest rate had no significant moderating effect on the relationship between liquidity and non performing loans of commercial banks in Kenya. The findings in Table 4.7 revealed that the interaction between interest rate and liquidity (interest rate*liquidity) had a p-value of 0.615 which indicates non significance. Therefore, at 0.05 significance level, the null sub hypothesis stated that interest rate had no significant moderating effect on the relationship between liquidity and non performing loans of commercial banks in Kenya was not rejected.

The second null sub hypothesis stated that interest rate had no significant moderating effect on the relationship between capital adequacy and non performing loans of commercial banks
in Kenya. The regression outcome in Table 4.7 indicated that the interaction between interest rate and capital adequacy (interest rate*capital adequacy) had a p-value of 0.893 which is not significant at 0.05 significance level. The study therefore failed to reject the null sub hypothesis stated that interest rate had no significant moderating effect on the relationship between capital adequacy and non performing loans of commercial banks in Kenya.

The third null hypothesis stated that interest rate had no significant moderating effect on the relationship between bank size and non performing loans of commercial banks in Kenya. The study results depicted in Table 4.7 indicated that the interaction between interest rate and bank size (interest rate*bank size) had a p-value of 0.479 which indicates non significance. As such, at 0.05 significance level the study failed to reject the null hypothesis stated that interest rate had no significant moderating effect on the relationship between bank size and non performing loans of commercial banks in Kenya.

Thus, the test for the moderating effect of interest rate on the relationship between firm characteristics and non performing loans of commercial banks in Kenya revealed that interest rate is an explanatory variable as it depicted significant explanatory influence on non performing loans of commercial banks in Kenya. The moderation test further revealed that interest rate does not moderate the relationship between the various firm characteristics and non performing loans as none of the interaction effect was significant.
CHAPTER FIVE
SUMMARY, RECOMMENDATION AND CONCLUSION

5.1 Introduction
This chapter of the study contains the summary, conclusion, recommendations for policy and as well as suggestions for further research. These are in line with the objectives, hypotheses and findings of the study.

5.2 Summary of the Study
Over the years, the increasing trend in the nonperforming loans of banks in Kenya has been a source of worry to all stakeholders. The investigation sought to establish the effect of firms' characteristics on nonperforming loans of commercial banks in Kenya. The specific objectives were to assess the effect of liquidity on non performing loans of banks, to evaluate the effect of capital adequacy on non performing loans of banks, to examine the effect of bank size on non performing loans of banks and lastly, to assess the moderating effect of interest rate on the relationship between firms’ characteristics and non-performing loans of commercial banks in Kenya. The study was guided by Market Power Theory, Agency Theory, liquidity Preference Theory and Capital Buffer Theory. Causal design was employed in the study. The analysis of the study was based on descriptive and panel regression analysis.

The study findings indicated that liquidity had insignificant effect on non performing loans of commercial banks in Kenya. Also, the study established that capital adequacy had significant effect on non performing loans of commercial banks in Kenya. The study further found that bank size had significant effect on non performing loans of commercial banks in Kenya. Lastly, the study established that interest rate had no significant moderating effect on the
5.3 Conclusion

The conclusion of the study is informed by the various findings of the study. With respect to liquidity, the study revealed that liquidity is not significant in predicting the NPLs. The study concluded that liquidity of commercial banks is not key in determining their levels of nonperforming loans.

With regards to capital adequacy, the study indicated that capital adequacy is significant in determining the non performing loans of commercial banks. The conclusion of the study was that the levels of non-performing loans of commercial banks in Kenya are high influenced by the capital adequacy levels of banks. This is expected as well funded banks are able to manage non performing loans.

The research discovered that size had a significant effect on NPLs. The conclusion is that bank size is key in determining the levels of non-performing loans of commercial banks in Kenya. The larger the size of banks is, the more the loans which they disburse and as such translating to increasing levels of non-performing loans. Large banks also have ability to disburse different types of loans i.e digital, corporate, retail and government lending which creates different types of exposure.

The study established that interest rate had no significant moderating effect on the relationship between firm characteristics and non performing loans of commercial banks in Kenya. The study therefore concluded that the relationship between liquidity and non performing loans is not influenced by interest rate. The study further concluded that the
relationship between capital adequacy and non performing loans is not affected by interest rates. Lastly, the conclusion of the study was the linkages between bank size and non performing loans are not impacted by interest rate. However interest is an important explanatory in explaining non performing loans are high when interest rate is high and low as interest rate goes down.

5.4 Contribution to Knowledge

The study contributes to knowledge in various ways. The study provides more insight on the applicability of agency, capital buffer, liquidity and market power theories on the linkages between firm characteristics and non performing loans. The study further contributes to knowledge by successfully providing the diagrammatical linkages of firm characteristics and non performing loans of commercial banks.

The study contributes to knowledge by coming up with empirical models and statistically testing the underlying linkages between firm characteristics that is, liquidity, capital adequacy, bank size and non performing loans of commercial banks in the Kenyan context.

5.5 Policy Recommendations

The recommendations for policy are guided by the study findings as they are based on only variables which significantly predicted the levels of NPLs. The study established that capitals had strong influences on non performing loans in Kenya. The study therefore recommends that bank management should build up additional buffers above the minimum stipulated capital requirements. Bank managers should therefore scrutinize each application for credit regardless of the levels of capital held by banks. The inquiry discovered that bank size had a
significant effect on NPLs in Kenya. The inquiry recommends that banks with larger assets can consider other investment options to diversify against the effect of high loan defaults.

5.5 Suggestion for Further Research

The study sought to establish the effect of firms’ characteristics on NPLs of commercial banks in Kenya. The study recommends that additional inquiries can be done for Micro Finance Institutions and also SACCOS. These studies can be used for purposes of making comparisons.
REFERENCES


Demirgunes K. (2016), the effect of liquidity on financial performance: evidence from Turkish Retail industry. *International journal of economics and finance vol 8 no 4;2016 E-ISSN 1916-9728*


Mboka, T. M. (2013). Effects of macro-economic variables on nonperforming loans


## APPENDICES

Appendix I: Data Collection Guide

<table>
<thead>
<tr>
<th>Year</th>
<th>Firm</th>
<th>Non-performing loans</th>
<th>Bank size (total assets)</th>
<th>Liquidity (liquid assets/total assets), (net loans/total assets)</th>
<th>Capital adequacy (core capital/total deposits), (core capital/total deposits)</th>
<th>Interest rate (CBR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>4,...,40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>