

**EFFECT OF COLLATERAL ON LOAN REPAYMENTS AMONG KENYAN
COMMERCIAL BANKS**

BY

APHIA SYOVATA MASILA

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DECLARATION

This research project is my original work and it has not been submitted to any university or college for examination.



Signed.....

Date...25th Nov 2021 ...

Aphia Syovata Masila

D61/5040/2017

This research project has been submitted for examination with my authority and approval as the university supervisor.

Signed: 

Date: December 7, 2021

Dr. Erastus Sifunjo Kisaka

Lecturer, Department of Finance and Accounting

Faculty of Business and Management Sciences, University of Nairobi

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DEDICATION

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TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENTS	iii
DEDICATION	iv
LIST OF ABBREVIATIONS AND ACRONYMS	ix
ABSTRACT.....	x
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the Study	1
1.1.1 Collateral.....	3
1.1.2 Loan Repayments	3
1.1.3 Collateral and Loan Repayments	5
1.1.4 Commercial Banks in Kenya	6
1.2 Research Problem	7
1.3 Research Objectives.....	9
1.4 Value of the Study	9
CHAPTER TWO: LITERATURE REVIEW.....	11
2.1 Introduction.....	11
2.2 Theoretical Foundation	11
2.2.1 Asymmetric Information Theory	11
2.2.2 Observed Risk Hypothesis.....	13
2.3 Determinants of Loan Repayments.....	14
2.3.1 Collateral.....	14
2.3.2 Lending Rates	15
2.4 Empirical Review.....	16

2.5 Conceptual Framework.....	20
2.6 Summary of Research Gaps.....	21
CHAPTER THREE: RESEARCH METHODOLOGY	23
3.1 Introduction.....	23
3.2 Research Design.....	23
3.3 Target Population.....	23
3.4 Data Collection	24
3.5 Data Analysis	24
3.5.1 Diagnostic Tests.....	25
3.5.2 The Model of Analysis	26
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION	28
4.1 Introduction.....	28
4.2 Diagnostic Tests.....	28
4.2.2 Homoscedasticity Test.....	29
4.2.3 Test for Multicollinearity	31
4.2.4 Tests for Autocorrelation	32
4.2.5 Unit Root Test.....	32
4.2.6 Test for Random and Fixed Effects	38
4.3 Inferential Statistics	40
4.3.1 Correlation Analysis	41
4.3.2 Multiple Linear Regression	42
4.4 Interpretation and Discussion of Findings	45
CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	50
5.1 Introduction.....	50
5.2 Summary	50
5.3 Conclusion	51
5.4 Recommendations.....	51

5.5 Recommendations for Further Study	52
5.6 Limitations of the Study.....	53
REFERENCES.....	55
APPENDICES.....	59
Appendix 1: List of Commercial Banks in Kenya as at 30 th December 2020	59
Appendix II: Data Collection Form	61
Appendix III: Research Data	63

LIST OF TABLES

Table 3.1: Operationalization of the Study Variables.....	27
Table 4.1: Data Tranche 1 Normality Test	29
Table 4.2: Data Tranche 2 Normality Test	29
Table 4.3: Data Tranche 1 Breusch-Pagan/Cook-Weisberg Test for Homoscedasticity.....	30
Table 4.4: Data Tranche 2 Breusch-Pagan/Cook-Weisberg Test for Homoscedasticity.....	30
Table 4.5: Data Tranche 1 VIF Multicollinearity Statistics.....	31
Table 4.6: Data Tranche 2 VIF Multicollinearity Statistics.....	31
Table 4.7: Data Tranche 1 Unit Root Test for Default Rate.....	33
Table 4.8: Data Tranche 2 Unit Root Test for Default Rate.....	34
Table 4.9: Data Tranche 1 Unit Root Test for Collateral	34
Table 4.10: Data Tranche 2 Unit Root Test for Collateral	35
Table 4.11: Data Tranche 1 Unit Root Test for Lending Rate.....	36
Table 4.12: Data Tranche 1 Unit Root Test for Lending Rate.....	36
Table 4.13: Data Tranche 1 Unit Root Test for Bank Size.....	37
Table 4.14: Data Tranche 2 Unit Root Test for Bank Size.....	38
Table 4.15: Data Tranche 1 Hausman Test of Specification	38
Table 4.16: Data Tranche 2 Hausman Test of Specification	40
Table 4.17: Data Tranche 1 Correlation Analysis	41
Table 4.18: Data Tranche 2 Correlation Analysis	42
Table 4.19: Data Tranche 1 Random Effects Panel Multiple Linear Regression.....	43
Table 4.20: Data Tranche 2 Random Effects Panel Multiple Linear Regression.....	44

LIST OF ABBREVIATIONS AND ACRONYMS

BOD	-	Board of Directors
CEO	-	Chief Executive Officer
CG	-	Corporate Governance
CMA	-	Capital Markets Authority
CRM	-	Credit Risk Management
CRO	-	Credit Risk Officer
FP	-	Financial Performance
RDT	-	Resource Dependency Theory
ROA	-	Returns on Assets
ROE	-	Returns on Equity

ABSTRACT

Collateral has been extensively utilized as a means to minimize the asymmetric knowledge that exists between borrowers and lenders. This reduces the risk of credit restriction. The overall objective of the study was to establish the effect of collateral on the default rate among commercial banks in Kenya. The target population was all the 42 licensed banks. The study employed a census and it examined the whole population. However, 3 banks were expunged from the analysis because they became licenced before the study period or ceased operations in the study period. Thus, 39 commercial banks were utilized for the analysis. Secondary sources of data were employed. Data was collected for the period from 2016 to 2020; the period comprised of five years. The study applied correlation analysis and multiple linear regression model with the technique of estimation being Ordinary Least Squares (OLS) so as to establish the relationship of collateral, the lending rate, and bank size. The two analysis methodologies were utilized in the current study. The study findings were that in the time period sampled from the year 2016 to 2020, only bank size was significantly related to default rate. They had a significant positive correlation. However, in the time period sampled from the year 2011 to 2015, the study findings revealed that collateral, lending rate, and firm size were not significantly correlated to default rate. Additional findings from the two sampled time periods were that the model entailing; collateral, lending rate, and bank size explains to a least extent default rate by having a co-efficient of determination of 5.22% and 2.07% respectively. Thus, 5.22% and 2.07% of the variations in default rate were explained by the model entailing collateral, lending rate, and firm size in the periods ranging from 2016 to 2020 and 2011 to 2015 respectively. Further findings were that the model entailing; collateral, lending rate, and bank size does not significantly predict the default rate. The final findings were that collateral, lending rate, and bank size did not individually have a significant relationship with default rate. Policy recommendations were that the policy makers should not majorly focus on collateral when trying to mitigate the default rate of financial institutions. Further recommendations to the financial institution regulators is to institute policies to increase the banks total assets, for instance, by increasing the core capital requirement, in order to mitigate the default risk. They may try to promote mergers, acquisitions, and amalgamations of financial institutions. Recommendations are generated to the financial sector practitioners and consultants are for them not to focus on collateral when crafting strategies to mitigate the default rate in their respective financial institutions. The final recommendations to the financial sector practitioners and consultants are to focus on bank size when crafting strategies mitigate the default rate. They may opt for mergers, acquisitions, and amalgamations of their respective financial institutions.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

People in wealthy nations tend to be less informed about the risks in lending, which leads to a possible informational imbalance greater than that in other countries (Menkhoff, Neuberger & Suwanaporn, 2006). Collateral has been extensively utilized as a means to minimize the asymmetric knowledge that exists between borrowers and lenders, this reduces the risk of credit restriction (Haselmann & Wachtel, 2007). Theory-based approaches concern various pathways which provide the ability to forecast credit risk and bank lending. In this case, the theories related to post-contract contractual frictions may be credited with the explanation of why collateral and loan risk are positively correlated with lender selection impact (Stiglitz & Weiss, 1981). Alternative explanations may be posed, such as the presence of collateral-induced selection effects, risk-shifting and loss-mitigation effects in post-facto analyses, or collateral-induced selection effects in post-exposure theories (Berger, Frame & Ioannidou, 2016). Because of the consistent findings from empirical research, the conclusion that this connection is present provides even more varied data that increases the difficulty for lawmakers to make informed decisions. If you assume loans have different properties depending on whether they are collateralized, it becomes clear that a diverse portfolio should have several lending channels that each serve different loans and have various kinds of collateral (Gaudêncio, Mazany & Schwarz, 2019).

Akerslof's (1970) paper is the central idea behind this research, which is also known as the asymmetric information theory. The modelled system shown by George Akerlof (1970) compares two states: one in which the dealer knows the quality of the automobile he is selling, but the buyer does not, and another one in which both parties know the quality of the vehicles they're selling. Informed agents include just one: the borrower. Additionally,

collateral is a tool used by Kenyan commercial banks to collect important information about the borrower's creditworthiness that they could not get any other way. The formal inspection hypothesis, which was formulated by Leeth and Scott, is driving this research (1989). A study found that when borrowers are identified as high risk, the amount of collateral they pledge increases, resulting in greater credit risk. That's because Kenyan commercial banks are planning to base their lending decisions on borrowers' visible credit quality. We think that banks should analyse the likelihood of repayment of the loans they provide, given the risk profile of the borrower, and then categorize borrowers accordingly. Riskier borrowers who request loans are subject to having to pledge collateral and paying higher returns to compensate for the risk associated with bank loans.

Collateral, a method that has long been used to provide protection against loan advances, is used by Kenyan financial institutions because of the same issue faced by financial institutions throughout the globe; credit risk (CBK, 2011). According to FSD-Kenya (2009), collateral has severe flaws in Kenya. First, it's difficult to find a borrower since there are no laws regarding collateral transfers between lenders. Because this results in little space for the borrower to manoeuvre, it further compels the borrower to accept whatever loan terms are given, even if those terms are offered in an environment where interest rates may be changing. Furthermore, getting an accurate idea of how much a loan is really owed has proven to be time-consuming and expensive for lenders. Restraining orders and injunctions obtained by the property owners have the side effect of holding onto property that the lender no longer wants, which is known as "unrealized securities and non-performing loans." In the example above, the total costs to the lender would be KES 379,700 and 150 working days if the borrower does not file suit. A faster implementation would raise the overall cost, since it might take up to four years to completely secure the network (Ochieng, 2015).

1.1.1 Collateral

Collateral is the value of assets pledged to a lender to help them in being paid back on a loan (Gitman, 2015). In a demonstration of commitment to repay the debt, the borrower provides collateral to the lender. The collateral is liquidated if the counterparty fails to keep his repayment obligations. This will lead to the recovery of the loan's original value from such profits (Broll, Pausch & Welzel, 2002). In certain countries, including the U.S., collateral is accepted by financial institutions to facilitate loan recovery. Banks will usually loan money to businesses by using collateral such as equipment or accounts receivable, whereas individuals typically pledge savings, a car, or a house as collateral (Sanchez, 2009).

According to Berge and Boye (2013), borrowers have a higher probability of servicing their debt if they have pledged collateral. Debt financing is closely linked to collateral. This improves the business lending firms profits. Collateral assistance helps to reduce default losses, which results in banks requiring more collateral from higher-risk borrowers (Gitman, 2015).

Financial institutions primarily evaluate collateral's worth in terms of how much money it can back up and, to a lesser extent, the certainty of getting that money back. Measuring and analyzing similar transactions, using tax assessments, and talking to subject-matter experts (Broll, Pausch & Welzel, 2002). This research will use collateral, which is measured by using the collateral fair market value divided by the gross loans and advances.

1.1.2 Loan Repayments

The lending industry is very vulnerable to default risk, since the whole or partial repayment of loan amounts may be jeopardized. Defaults are regarded as losses incurred by investors

when borrowers fail to keep promises to pay as agreed. To provide a further framework for default risk in connection with financial institutions, the committee specifies the likelihood that a creditor or debtor would fail according to the conditions established. Many financial terms are capable of being defined using the word "default." For example, when looking at default risk, the danger that the actual return on an investment or credit provided would differ from the anticipated return (Tsai & Huang, 1997). When a borrower refuses or cannot pay amounts due, the disbursed loan is classified as non-performing, and the credit becomes non-performing equity. Non-Performing Loan (NPL) refers to a credit advance that is more than three months behind in payments or has paid more than three months of interest after refinancing, capitalizing, or deferring the payments was agreed upon. The period of time until repayment has passed, but the money is not yet all repaid are known as NPLs (Conroy, 2003). Unpaid loan values as a percentage of the amount borrowed are defined as NPLs in a report written by Ahmad and Ariff (2007).

To reduce the rate of delinquent loans, banks should take every measure feasible. These must be performed in order to maintain loan quality and to avoid losses (Ahmad & Ariff, 2007). The liquidity of banks is negatively affected, which has a negative impact on banks' profits. In addition, it poses a significant danger to the customer's deposit. When loans are not repaid, no more money are available to be given to other debtors (Conroy, 2003). Both borrowers and lenders report being impacted by the costs of defaults on loans. When expenditures are subtracted from the value of the borrower's assets, whatever profit the lender has comes from the interest, legal fees, and the cost of the principal and related expenses. When a borrower goes into default, it's a compromise between losing their reputation and missing out on investment opportunities because of their loan being repaid (Kiefer, 2008).

Having substantial asset holdings in the commercial banks, loans are significant assets and thus successful banks are primarily measured in terms of their net-loss-to-total-asset ratio, known as the NPL ratio. As a consequence of poorly managed credit, many loans are not repaid, and that results in an increased ratio of NPLs to advances. Lenders want a low ratio, indicating that borrowers have excellent repayment ability (Thygeson, 1995). Accordingly, the NPL ratio will be measured in this research as the indication of financial distress.

1.1.3 Collateral and Loan Repayments

Empirical evidence provides evidence for the assertion that debtors are ready to promise more and provide attractive collateral if they believe that it will help them get lower interest rates. As a method of raising capital, they have chosen to pledge collateral as a way to minimize the costs associated with searching for and testing prospective financial institutions (Bester, 1985). In equilibrium, banks conduct full due diligence on all projects, but fund only the most promising and charge interest that is equal to the cost of funds and the amount of money that is allocated to do the due diligence on the project and the prorated share of the cost of doing due diligence on all rejected projects. Generally, banks relax credit requirements if they are backed by sufficient collateral. Assigned property rights reduce credit risk, however this is only due to a borrower selection impact (Berger, Frame & Ioannidou, 2016).

Fecundating and beneficial studies have strongly supported the hypothesis that lenders tend to select borrowers according to various factors, such as financial characteristics (such as loan history and collateral) and risk measures (such as default risk and portfolio interest rate risk), leading to strong borrower selection (Mann, 1997). This is supported by Voordeckers and

Steijvers (2006), who found evidence that a "primary bank" must provide collateral to limit debtors' access to the new loans from other institutions and lower future borrowing risk.

As Elsas and Krahnert (2000) have shown, collateral does not correlate with loan risk, no matter what top five German banks use as collateral. Lenders that have previously dealt with debtors in order to strengthen their positions in future negotiations of lending contracts use collateral to help them secure the deals. The results of Cressy and Toivanen (2001) show no connection between a bank's default and collateral demand. According to Berger, Udell, and Udell (2004), various data samples with varying kinds and features of collateral provide a fundamental source of research conflicts in understanding the impact of collateral pledging on credit risk.

1.1.4 Commercial Banks in Kenya

The Kenyan banking sector is regulated by the Central Bank of Kenya (CBK), the Banking Act, and the Companies Act. The CBK is given the mandate of financial policies formulation and implementation, managing the banks liquidity, credit worthiness as well as maintain a proper monetary policy system. Commercial banks are financial institutions that are licensed by the CBK for accepting deposits and issuing loan advances to their clients. As at June 30 2020, in Kenya there were 43 licensed commercial banks and one mortgage finance bank. Thirty banks were owned by locals while 13 were foreign owned (Githaiga, 2020).

Collateral lending is another classic method for providing security against loan advances (CBK, 2011). Collateral has many issues in Kenya (FSD-Kenya, 2009). To begin with, the availability of loans is limited since no specific law exists for transferring collateral between lenders. Even in a climate of fluctuating interest rates, the debtor has little wiggle space if

collateral is already attached by one institution. To top it off, discovering the loan amount due via the process of foreclosure, seizure, and enforcement proved to be tedious and expensive for lenders. Banks seek injunctions against borrowers, which in certain cases causes difficulties in the process of disposing property since the bank does not get rid of the securities and loans that aren't performing. This strategy costs the institution KES 379,700 and 150 days of litigation time if the borrower chooses not to go to court. There is a risk that, in order to protect the company's data, the cost to manage the security will increase, and this may result in the cost increasing and lengthening to four years.

1.2 Research Problem

Generally speaking, many commercial banks are presently grappling with debt payback (Njeruet & Mueller, 2014). The danger of loan defaults arises from the chance that debtors may fail on the terms of debt, which might then put a company's capital at risk (Broll, Pausch & Welzel, 2002). Unarticulated risks inherent in lending are especially problematic due to information asymmetry issues, which may be worse than those seen in industrialized nations (Menkhoff, Neuberger & Suwanaporn, 2006). Because of this, collateral has been extensively utilized as a method to mitigate asymmetric information between borrowers and investors and also to minimize credit rationing (Haselmann & Wachtel, 2007). People who do not have to repay a loan do not need to look at the collateral for collateral loans (Stiglitz & Weiss, 1981). To refuse repayment of loans may slow down a country's economic recovery and growth. One way in which financial development is curtailed is by potential loan borrowers being denied the opportunity to access loans from commercial banks, since a big chunk of bank funds that could be made available to them as loans are still tied to non-repaid loans (Oni, Oladele & Oyewole, 2015).

Kenyan banks, like other financial institutions globally, face the same problem of credit risk. In the recent past, the CBK put two banks on receivership, which is Chase Bank, Dubai Bank, and Imperial Bank of Kenya due to poor financial performance majorly caused by non-repayment of loans. In order to mitigate credit risk, Kenyan banks they rely heavily on collateral lending which a traditional instrument of providing security is against loan advances to the borrower (CBK, 2011). FSD-Kenya (2009) notes that the process of realizing the loan amount outstanding from security liquidation, enforcement, has proved to be very cumbersome and costly for lenders. The owners of property obtain court injunctions and restraining orders, which sometimes make it difficult to dispose the said property leaving the lender with unrealized securities and non-performing loans. Thus, this study seeks to examine if the collateral amassed by the Kenyan banks has any effect on loan repayments.

Many investigations have been performed throughout the globe, in certain regions, and locally regarding loan payments. Berger and Udell (2002) conducted a research study to identify collateral's significance in defining financial risk among the 460 U.S. banks. There was a failure to perform the research in Kenya, which presented a context gap. The study by Elsas and Krahn (2000) revealed a positive correlation between loan quality and the amount of collateral needed to secure top five German commercial banks' loans. There was a methodological problem with the research, since it was not done in the Kenyan setting. The study on non-performing loans in Ethiopian banks by Wondimagegnehu (2012) analyzed collateral as one of the variables considered. While conducting the study, the researchers neglected to account for the fact that it was done in Kenya, and therefore the results did not meet expectations. Japhet and Memba (2015) investigated the collateral types banks in Kenya choose to minimize loan risk, especially for microfinance customers. The research aimed to

discover which forms of collateral provide the best results. This therefore highlights a gap in thought.

Commercial banks and other financial organizations get an uncertain response from academia in regard to collateral and its impact on loan repayment. Following Berger, Frame, and Ioannidou (2016), collateral pledging has been shown to be inversely related to loan risk, although various kinds and quantities of collateral may have conflicting empirical results on their impact on credit risk. The depth of discussions on this area and the notable variances in the findings creates a room for further studies. Thus, it is imperative to conduct the study in the Kenyan context so as to determine the findings that would hold in the Kenyan context. In order to fulfill the research question and cover the gaps, this research investigated how the value-specific factors of banks in Kenya affect the values of financial institutions.

1.3 Research Objectives

This research broad objective was establishing the effect of collateral on loan repayments among commercial banks in Kenya.

1.4 Value of the Study

It is critical to lenders, government regulators, investors, and academics that loan quality be of high importance. Future research in the financial industry will build on this research and on top of that, it will be relevant to other researchers and academics as well. This research will serve as one of the few studies looking at collateral and NPLs, thus it will increase the body of knowledge going forward. The literature itself will serve as a standard for future research. Research results will be referred to in subsequent scholarship by researchers who are interested in the research of credit risk administration and its effect on financial institution

performance. This means that the research output will provide a reservoir of priceless literature on ideas and policies informing them. Researchers that are interested in examining the connections between many different variables may find the study technique which utilizes inferential statistics, including correlation analysis and multiple linear regression, helpful.

This research gives policy makers and financial regulators foundation to manage the strategic outline to help eliminate financial crises and identify credit risks that result from loan quality. This will benefit the regulators of commercial banks, government agencies, and policy makers, all of whom will receive knowledge on collateral's impact on loan repayment. The research may be invaluable to governments in the development of regulations on finance. In addition, policy makers should understand about the existing regulatory framework's pitfalls and what they are doing to the operations of the banking industry. Loan defaults occur if there is an information imbalance between the borrower and the lender, and collateral placement helps bridge that knowledge gap. CBK rules on collateral that would maximize loan payback will thus be feasible.

This is significant to shareholders, consultants, and the bank's management. It will provide an overall look at collateral affecting loan payback rates. Leveraged loans usually benefit shareholders, since they result in a rise in shareholder value. On the other hand, NPLs have the opposite effect: they decrease shareholders' financial performance in commercial banks because of reduced financial performance. It is critical that stakeholders in the Kenyan banking industry and the whole banking sector understand the implications of collateral on loan performance, as it impacts bank survival, financial stakeholders, and consumer trust. Making sound choices on management of loan quality would allow management to make informed decisions.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The purpose of the chapter is to create insights on the theories of credit risk to help in the comprehension of its concepts, structures, and the empirical literature on how it is influenced by collaterals, among other mitigating factors. The significance of the chapter is to establish the probable knowledge gaps in the studies undertaken previously by scholars on the effect of collateral on credit risk management and the moderating impact of firm size on the relationship.

2.2 Theoretical Foundation

The literature review explores the work conducted by other scholars concerning the influence of governance on the value of listed firms. The section encompasses the detailed knowledge of related concepts and provides a platform on which the results will be built upon and in addition overcome the shortcomings of the study. Theories are essential in the various sections as they establish the phenomena and principles that relate to the topic. The theoretical framework depicts the interrelationship between different ideologies and provides the guidelines for the project or business endeavour (Lyon, 1977). The theories to be included in this study are the asymmetric information theory and observed risk hypothesis.

2.2.1 Asymmetric Information Theory

Akerlof's (1970) automobile market research gave rise to the asymmetric information hypothesis. According to the mathematical model proposed by Akerlof (1970), a market in which both the vendor and the buyer have incorrect information will take place when two people face each other, one of them knows about the quality of the vehicle while the other does not. In a symmetrical state of knowledge, consumers derive more value than in an

asymmetrical one. However, the phrase “asymmetric information” has been used in a more general sense, which doesn't directly contrast the difference between a position of having superior knowledge or being more informed.

It is possible to use collateral as a helpful information signalling device that assists financial institutions in determining the creditworthiness of a borrower. If a high-quality borrower who has private knowledge about their own excellent creditworthiness understands that the loan default and collateral loss are improbable, then these borrowers don't rely on government data to confirm their creditworthiness. People who promise collateral in exchange for better loan conditions are ready to do so when their quality is above average, therefore causing risk mitigation and reduction (Stiglitz & Weiss, 1981; Bester, 1985; Chan & Kanatas, 1985; Besanko & Thako, 1987). The risk of moral hazard is reduced with collateral. Collateral creates an incentive for borrowers to expend maximum effort or to invest their loan money in high-quality assets since a borrower who does not have collateral is more likely to fail and lose the investment than one who does. . As collateral is present, a reduced ex post default is predicted (Booth, Thakor, & Udell, 1991). However, collateral needs monitoring, and the expense of monitoring may negate any possible benefit in decreased loss for banks as a result of collateral. Another aspect of the market is that collateral is believed to be connected to riskier borrowers (Berger & Udell, 1990; Jimenez & Saurina, 2004; Inderst & Mueller, 2006).

The theory is relevant to this study since it focuses on collaterals and how they impact on loan repayments. One agent, the borrower, is better informed than another agent, the lender. Consequently, collateral serves as a signaling device that commercial banks in Kenya have to

use in order to get knowledge about the customer's quality that is otherwise difficult to obtain.

2.2.2 Observed Risk Hypothesis

Leeth and Scott noticed the risk hypothesis (1989). According to the seen risk theory, the collateral need increases when the risk of the borrower is known and when the creditworthiness of the loan is uncertain. The observed risk hypothesis posits that the criteria used to choose borrowers depends on their credit quality, and this theory is known as the observed risk hypothesis. According to the observed risk theory, banks select debtors according to their risk profile, resulting in debtors with high risk bearing the increased interest expense and pledging collateral to repay the hazardous investment that banks have made. (Hanedar et al., 2014).

Based on their background checks, banks will be able to identify problematic borrowers who have greater-than-average risk. Due to collateral reducing the likelihood of loan default, banks prefer higher-risk borrowers with greater collateral. There is strong support for the theory that lenders allow higher-risk borrowers to have high-collateral values because they hold collateral is strongly linked with high risk borrowers and because it is the only apparent mechanism that could explain the observed-risk hypothesis. To counteract the negative assessment of a risk, the borrower has to provide more collateral and suffer higher interest rates (Bester 1985; Besanko and Thankor, 1987).

The theory links to the study to the extent to which the credit quality of borrowers is known by the Kenyan commercial banks. This, coupled with the fact that commercial banks in Kenya have been using selection criteria based on observable credit quality, suggests that

borrowers in Kenya will be selected. There are two key concepts to examine here: sorting borrowers according to their risk profile, and riskier borrowers receiving higher interest rates in order to reimburse the risky investment made by the banks.

2.3 Determinants of Loan Repayments

The various bank-specific loan repayment determinants will be elaborated in this section. These include: collateral, prevailing interest rates, derivatives, and bank size.

2.3.1 Collateral

Collateral is the percentage of a loan that a borrower has pledged as security to a lender (Gitman, 2015). The term collateral may be used to describe an asset given to the lender in order to demonstrate that the borrower intends to repay the loan. The collateral is liquidated, and the debt is paid in full, if the counterparty fails to meet repayment obligations (Broll, Pausch & Welzel, 2002). The collateral that banks take globally to ensure loan recovery includes items such as personal guarantors, receivables, and fixed deposit accounts. People utilize their possessions, such cars and homes, to obtain loans, whereas businesses often use their equipment (Sanchez, 2009).

Extensive body of research supports the notion that collateral and non-repayment (of loans) are related. The aforementioned studies by Voordeckers and Steijvers (2006) substantiate the hypothesis that "major banks" demand collateral to restrict debtors' capacity to receive future loans from other lenders and decrease risk. Mann (1997).

As Elsas and Krahenen (2000) have shown, collateral does not correlate with loan risk, no matter what top five German banks use as collateral. Bankers that have previously dealt with

clients in order to strengthen their positions in future negotiations of lending contracts use collateral to help them secure the deals. The results of Cressy and Toivanen (2001) show no connection between a bank's default and collateral demand. according to Berger, Frame, and Ioannidou (2016), various data samples with varying kinds and features of collateral provide a fundamental source of research conflicts in understanding the impact of collateral pledging on loan risk.

2.3.2 Lending Rates

In 1936, John Maynard Keynes defined interest as the price paid to borrow capital over a certain period of time. In the context of lending, interest rate is the cost of borrowing in a certain nation. Interest rate is the amount of money borrowed and the amount of interest paid each year by a borrower to a lender. The costs associated with the use of existing resources against projected future resource use (Kwak, 2000).

2.3.4 Bank Size

Firm size denotes the scale of firms' operations (Ehikioya, 2009). Three main measures are applied when measuring firm size and they include, sales, market value of equity and total assets. The three measures are the mostly used measure of firm size in empirical studies done on corporate finance (Guest, 2008). Astrini (2014) and Barus and Erick (2016) both discovered that size of the commercial banking sector is positively and somewhat significantly related to nonperforming loans. However, the findings of a study conducted by Dewi (2015) established contrary results, that bank size negatively impacts on NPLs. Radja (2016) in the NPL analysis with an estimated panel of commercial banks in Jordan during 2008-2012, revealed that firm size has an insignificant relationship with NPL.

2.4 Empirical Review

The study by Elsas and Krahnert (2000) revealed a positive correlation between loan quality and the amount of collateral needed to secure top five German commercial banks' loans. Correlation analysis was used as the primary statistical technique in the research. According to the research, collateral has no connection to loan risk. The research found that lenders that are acquainted with borrowers and have a prior connection with them to enhance their negotiating power need collateral. In doing the study, this creates a contextual gap, since the research was not done in the Kenyan setting. In contrast to other studies, the sole inferential statistical analysis used in this research was a correlation-based approach. Thus, this presents a methodological gap that the current study is intending to fill by conducting multiple linear regression analysis.

In the study by Chau and Hieu (2018), they wanted to know how collateral qualities might influence loan delinquency in Vietnam. In Vietnam, results of a research that used a probit instrument to analyze unique data of 2,295 internal loan accounts indicated that collateral quality negatively impacts the likelihood of loan default. This study's result corroborated the lender selection effects being eclipsed by the weighting of client selection and risk shifting. According to the research, high-quality collateral such as additional information or certification enables banks to minimize adverse selection and moral hazard issues, while increasing the credibility of loan applicants. Because the research was performed in a different setting, this results in a gap in context. The research performed a probit analysis using instrumental variables, often known as instrumental variables regression or instrumental variables technique. Using the techniques of correlation and multiple linear regression analysis, this research intends to address an underlying methodological gap.

Pozzolo (2002) investigated the relationship between secured lending and borrowers' riskiness. The research used a theoretical model which showed that banks would discover the optimum strategy to protect themselves from greater credit risk by charging a higher interest rate while demanding a guarantee. According to the research results, the assumptions of the model were confirmed. This is because banks demand more risk for loans with higher loan amounts, smaller credit scores, and with numerous banking connections. In the research results, it was shown that having assets that can be placed as collateral makes it more probable that a loan would be obtained. The results from the research showed that secured loans had higher interest rates than unsecured loans, proving that guarantees do not mitigate the increased riskiness of loans. Finally, the research results showed that businesses in the new economy sectors do not have any additional advantage to obtaining bank loan secured vs unsecured. Contextual research was not done in the Kenyan setting, resulting in a gap in the results.

This research group investigated the social collateral model of Malaysian microfinance institutions (Nabawiyah and Amrizah, 2015). The research proposal supported the social collateral model that involves social capital, group pressure, and training being utilized as a supportive mechanism to help borrowers repay loans and foster human and economic capital development. The results prove that the social collateral model enables microfinance institutions to deliver loans in a smart and efficient manner, while also screening out the capacity of the loan recipients to manage loan repayments, helping the debtors to succeed in microfinance and grow their personal and social well-being. The study analyzed the guarantorship aspect of collateral and did not analyze collateral entailing offering of physical assets as security against funds borrowed. This presents a methodological gap that the current study is intending to fill.

Determinants of non-performing loans in Ethiopian banks were investigated in a research published in Wondimagegnehu (2012). Statistics, in the form of descriptive statistics, were employed as the principal tool of analysis. The study's results showed that debt in which collateral is applied has a much lower risk of defaulting compared to debt in which collateral is not applied. The research found that borrowers would honour their loan obligations, provided they used collateral to pledge. Additionally, the research found that borrowers will honour their debt commitments if they had put up collateral, and this leads to a second conclusion: loan protection has a significant impact on a financial institution's profitability. Because the research was performed in a different setting, this results in a gap in context. In the research, descriptive statistics was used and there was no inference done to prove whether or not the studied variables were related. To begin with, this creates a gap in the research methodology that the current study intends to fill by using multiple linear regression analyses, which include correlation and correlation analysis.

To figure out whether collateral informal lenders in Tanzania are using other methods to help guarantee loan repayment, Charles and Mori (2016) investigated the types of collateral informal lenders use in Tanzania. To evaluate the effect of mobile and immovable assets on loan payback and delinquency, this research precisely evaluated how each asset class impacts loan repayment and delinquency, and determines how guarantorship and relationship lending serve as collateral to enhance loan repayment. This research used a dataset of 835 informal Tanzanian loan borrowers to perform descriptive and econometric analyses. The results found that assets that may be moved, such as checking and savings accounts, help borrowers who are regarded as less creditworthy get loans from informal sources and pay them back. In addition, the research discovered that a tiny percentage of clients pledged property that they cannot sell or bequeath as security when obtaining loans from informal lenders. Study

findings indicated that relationship lending and social collateral are essential in expanding the number of people who have access to informal lenders. So, the research did not take place in the Kenyan setting, thus this introduces a gap in understanding.

In the local environment, researchers Japhet and Memba (2015) conducted a study on collateral, to help decrease loan risk for banks in Kenya. They discovered that cars are preferred over property and buildings due to the complex legal processes and greater expenses required in disposing land and structures. The conclusion of this research is that the lower the likelihood of default for a loan, the higher the amount of liquid and desirable collateral. The study did not endeavour to establish the causal effect of collateral on loan repayments but sought to determine the most suitable types of collateral. Thus, this presents a conceptual gap.

The aim of the research conducted by Karumba and Wafula (2012) was to find additional options for the Kenyan banking sector. The research utilized time series data to develop a long-term model for bank lending behavior in Kenya, which is composed of long-term relationships and error correction. As shown by the research, the dependence on collateral lending by the Kenyan banking industry is heavily prevalent, perhaps because of less emphasis on alternative credit mitigating methods. Furthermore, credit risk transfer and credit referencing were investigated for further possible applications in Kenya. Credit reference has been shown to expand lending activity, provided that institutions have capacity, regulation, and supervision in place in advance. Although collateral was not studied, this research looked at lending activities and not loan repayments. Therefore, this research seeks to fill the conceptual vacuum existing here.

A case study was conducted to find out what variables influenced clients of commercial banks in Kenya to pay their loans. The primary data for the research was derived from Barclay's employees in Kenya, both in the branches in Nairobi County and the mass-market clients. Research results suggest a strong connection between business and group variables, as well as debtors' characteristics, and recovery outcomes. Collaterals were part of loan factors. The study conducted a case study of one sole bank. However, the findings of a case study can be biased and can also not represent the whole industry. Thus, this presents a conceptual gap that the current study is intending to fill by analysing the whole banking industry. The study also utilized primary data. This presents a methodological gap that the current study intends to fill by utilizing secondary data.

2.5 Conceptual Framework

An inquiry's foundation is laid by selecting a suitable conceptual framework, in this case by defining what the relevant knowledge concepts are. Clearly illustrated, the structure gives the researcher the ability to deduce information. For this research, the independent variable was collateral. The control variables were; lending interest rates and bank size. The dependent variable were loan repayments. Figure 2.1 exhibits the conceptual framework developed for this study.

Various methods for risk reduction include having collateral, relying on guarantees, entering into on-balance sheet netting, and using credit derivatives. Nations and/or environmental factors like as laws and regulations, national accounting systems, and lending institutions' size, complexity, and strategies appear to be significant factors when it comes to how banks use these methods.

Independent Variable

Dependent Variable

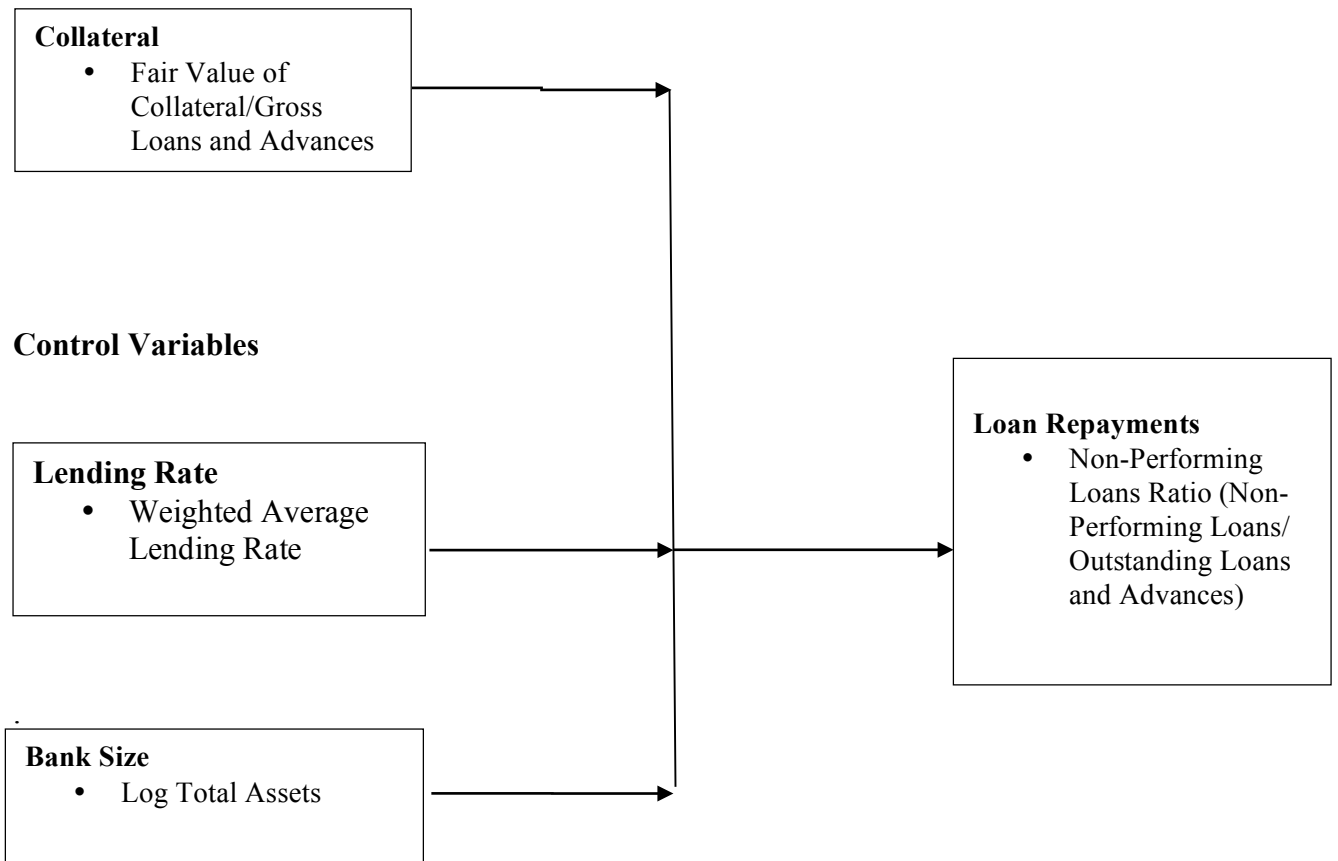


Figure 2.1: Conceptual Model

2.6 Summary of Research Gaps

With collateral, borrowers have a stronger incentive to exert maximum effort or to invest their loan money in productive ventures since they have more to lose in the event of failure. A large number of research allude to a favourable correlation between loan non-repayments and collateral. The above quote includes the following evidence in support of the assertion that collateral is linked to default risk: In addition, collateral has been shown to have no connection and even a substantial relationship to loan risk. Constant, Stephan, and Michael Eades (2016) contend that data sets with various collateral kinds and characteristics provide conflicting results regarding the connection between collateral pledging and loan risk. This literature did not originate in Kenya, which creates a vacuum in understanding the circumstances in which the research was done.

Of the local studies reviewed, the study by Japhet and Memba (2015) did not endeavour to establish the causal effect of collateral on loan repayments but sought to determine the most suitable types of collateral thus presenting a conceptual gap. The study by Karumba and Wafula (2012) focused on the effect of collateral on lending activity and not on loan repayments thus presenting a conceptual gap. The study by Ochung (2013) conducted a case study of one sole bank. However, the findings of a case study can be biased and can also not represent the whole industry. Thus, this presents a conceptual gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter is the blueprint of the research study where it lays out the methodology of the study. The chapter contains several subsections. The research design expounds on the design applicable to the study. The target population details the population of interest and sampling method applicable if any. Data collection is also looked into where data required is specified and how it is going to be collected. Finally, the chapter show the data analysis technique that will be applied by the researcher.

3.2 Research Design

In this study, the researcher embraced a causal research design since the main objective is to establish the cause and effect amongst the study variables. Therefore, the design is applied due to the fact that it addresses them aim of the research by exploring the relationship of the study objectives. This study was formal since it borrows from applicable theories and it uses different literatures to guide it. In addition, it was an ex-post facto research study since the variables will be measured, rather than manipulated. It was a field environment with the country as the unit of study. This design considers factors such as the method of study, the variables applied in the research, and data collection methods.

3.3 Target Population

Zikmund, Babin, Carr, and Griffin (2010) refers population to the total number of individuals or people in a study. The population normally have characteristics that are alike. Grabich (2012) opines that a grouping of elements, events, or people, which are being examined with the goal being provision of answer to research question, denotes a study population. In this

study, the population of the study was all forty-two licensed commercial banks shown in Appendix I. Since all the whole population will be studied, the study was a census.

3.4 Data Collection

Data collection process is very important because of the fact that it has an impact on the authenticity of the study findings. The secondary data was gathered from the individual banks' annual reports and financial statements. The annual unit of analysis was used. Data was collected on an annual basis from 2011 to 2020. Data on gross non-performing loans, weighted average lending rates, gross loans advances, fair value of collateral, financial assets, and total assets was gathered.

3.5 Data Analysis

In order to simplify the analysis, interpret and comprehend the data collected, it was arranged, tabulated, and simplified. Upon organizing the data, the panel data was analyzed through aid of statistical analysis software known as STATA Version 14. Multiple linear regression and correlation analysis was done. Correlation analysis was able to establish the strength and association of the independent and control variables on the study's response variable. On the other hand, regression analysis was used to establish the significance of the association amongst the study variables. Tables were used to present the quantitative results found.

The study maintained the confidence level at 95%. At 0.05 level, the findings were set to be statistical significant and this means that for values to be significant they ought to be below 0.05. In forecasting loan repayments, a statistical inference technique is used in concluding the accuracy of the model. The 95% confidence level was applied in testing the model

significance. The significance values determined how the predictor variables relate to the response variables.

3.5.1 Diagnostic Tests

It is done to guarantee the truth of the linear regression models in various ways. The assumption involves random sampling of observations, zero conditional mean, no multicollinearity, normal distribution of error terms, and the linear regression model must be linear in parameters. According to the Gauss-Markov theorem, the first five assumptions in linear regression provide the most unbiased estimators (Grewal et al., 2004). It is essential that all assumptions be honoured while using regression, else the results are wrong. Using exact numbers may lead to estimates that are meaningless, and inaccurate resulting in estimates that are not trustworthy, and therefore broad and narrow confidence intervals (Gall et al., 2006).

To guarantee that the assumptions are met such that the best linear unbiased estimators are available, the researcher ought to undertake diagnostic tests. Regression diagnostics evaluate model assumptions and test whether or not there are interpretations with a large, unjustified impact. Data collection was done in order to do diagnostic tests for linear regression model, including autocorrelation, multicollinearity, linearity, and normality. Shapiro-Francia test was used to verify if a distribution of Gaussian type is normal. This is suitable in cases when the required variance and mean are both important. If something is linear, then the relationship between the dependent and independent variables must follow a proportionate relationship. The authors write that (Gall et al., 2006). The Breusch-Pagan Cook-Weisberg Test for Homoscedacity was used to identify homoscedacity and this allowed for the Linearity Test to be performed.

Variance Inflation Factors (VIF) was applied in testing for multicollinearity and it showed whether the predictor variables have a significant correlation on each other. Grewal *et al.* (2004) notes that the primary reason for existence of multicollinearity is having small sample sizes, low measure reliability and low explained variables in the independent variables. Durbin-Watson Statistic will test for existence of autocorrelation.

The data was tested for the presence of unit roots so as to eliminate misleading regression findings. The main goal of unit root testing is to ensure that the pre-estimation macroeconomic variables have been incorporated in the correct sequence (1, 1). Unit root tests of Fisher type was used. A variable test for changing and random impact on overtime is performed using the Hausman specification test. The null hypothesis assumes that variables have no impact; the alternative hypothesis argues that they do. The null hypothesis would therefore be rejected if the value of the meaning is less than α (0.05) and if the alpha value exceed 0.05 it will lead to rejection of the null hypothesis.

3.5.2 The Model of Analysis

The research objectives were accomplished by undertaking multiple linear regression analysis, which examined whether the independent variables have any impact on credit risk management. The statistical tests were undertaken at a significance level of 95% which implies that the margin of error is up to 5%. The below model was applied;

$$Y_{i(t+1)} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \epsilon$$

Where:

$$Y_{i(t-1)} = \text{Loan Repayment}$$

α = Constant

$\beta_1 - \beta_4$ = Beta coefficients

X_{1it} = Collateral

X_{2it} = Lending Interest Rates

X_{3it} = Bank Size

e = error term

Table 3.1: Operationalization of the Study Variables

Variable	Measurement
Loan Repayments	Will be denoted by the default rate which is indicated by the NPL ratio; (Non-Performing Loans/ Outstanding Loans and Advances) (Thygerson, 1995).
Collateral	(Fair Value of Collateral/Total Loans and Advances)
Lending Rate	Will be denoted by the lending rates (Interest Income/Loans and Advances)
Bank Size	Natural logarithm of average book value of entire assets of a bank during the period (Munyambonera, 2011).

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

The present chapter focuses on the analysis of data, discussion, and interpretation of the results, which are all presented in the previous chapter. It is divided into three parts, which are as follows: diagnostic tests, inferential statistics, and the interpretation and discussion of findings.

4.2 Diagnostic Tests

To guarantee the Best Linear Unbiased Estimators, diagnostic tests were performed prior to performing linear regression (BLUE). Normality tests, homoscedacity tests, multicollinearity tests, autocorrelation tests were among the diagnostic tests used in this research. To determine normality of the distribution, Shapiro-Wilk test was used and complemented by Kolmogorov-Smirnov test. Test of Breusch-Pagan was employed to determine while to establish multi-collinearity, tolerance and VIF were adopted. The Durbin-Watson d statistic was utilized in the study to test for autocorrelation. Additionally, the Fisher-type unit root test was used to conduct the unit root test, while the Hausman test was also conducted to determine if regression of fixed or variable effects by the panel should be performed. The tests were conducted for the two time periods, from the year 2016 to 2020 and from the year 2011 to 2015.

4.2.1 Normality Test

Table 4.1 emphasizes testing of normal distribution for the study variables for the time period, from 2016 to 2020.

Table 4.1: Data Tranche 1 Normality Test

Variable	Obs	W'	V'	z	Prob>z
DefaultRate	187	0.06032	144.475	10.238	0.00001
Collateral	187	0.53544	71.426	8.788	0.00001
LendingRate	187	0.79392	31.685	7.114	0.00001
FirmSize	187	0.95925	6.266	3.778	0.00008

The significance values for all the variables are less than the α values (0.05) as indicated in Table 4.1. Therefore, the variables' data series are not normally distributed. Standardization is the cure for non-normal data. The data series of all variables were thus normalized as a means to correct distribution non-normality.

Table 4.2: Data Tranche 2 Normality Test

Variable	Obs	W	V	z	Prob>z
DefaultRate	186	0.67302	45.799	8.767	0.00000
Collateral	186	0.53781	64.738	9.56	0.00000
LendingRate	186	0.83192	23.542	7.241	0.00000
FirmSize	186	0.95991	5.615	3.955	0.00004

The significance values for all the variables are less than the α values (0.05) as indicated in Table 4.2. Therefore, the variables' data series are not normally distributed. Standardization is the cure for non-normal data. The data series of all variables were thus normalized as a means to correct distribution non-normality.

4.2.2 Homoscedasticity Test

Table 4.3 includes homoscedasticity tests of every independent variable used in the research for the period ranging from 2016 to 2020. The test is used to establish if all the residuals have a constant variance.

Table 4.3: Data Tranche 1 Breusch-Pagan/Cook-Weisberg Test for Homoscedasticity

Ho: Constant variance

Variables: fitted values of DefaultRate

chi2(1) = 796.00

Prob > chi2 = 0.0000

The null hypothesis is that there is no homoscedasticity. The study employed a 5% significance levels. The study findings established significance value of (Prob > chi2= 0.0000), which is below the study critical value of ($\alpha=0.05$) leading to rejection of null hypothesis. Thus, all the predictor variable data series employed in the study are heteroscedastic. The research used robust standard error which is an approach to heteroscedasticity of unbiased standard errors in OLS coefficients.

Table 4.4 includes homoscedasticity tests of every independent variable used in the research for the period ranging from 2011 to 2015. The test is used to establish if all the residuals have a constant variance.

Table 4.4: Data Tranche 2 Breusch-Pagan/Cook-Weisberg Test for Homoscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of DefaultRate

chi2(1) = 0.15

Prob > chi2 = 0.6948

The null hypothesis is that there is no homoscedasticity. The study employed a 5% significance levels. The study findings established significance value of (Prob > chi2= 0.6948), which is below the study critical value of ($\alpha=0.05$) leading to the null hypothesis not being rejected. Thus, all the predictor variable data series employed in the study are homoscedastic.

4.2.3 Test for Multicollinearity

In testing for multicollinearity, VIF were carried out and table 4.5 below exhibit the findings for the years ranging from 2016 to 2020.

Table 4.5: Data Tranche 1 VIF Multicollinearity Statistics

Variable	VIF	1/VIF
FirmSize	1.04	0.965281
Collateral	1.03	0.973304
LendingRate	1.01	0.990635
Mean VIF	1.02	

In statistics, the general principle is that the VIF values ought to be more than 1 and less than 10. According to this study findings, the VIF values for all the independent variables applied are greater than 1 and less than 10. This suggests that the independent variables applied in the study do not have multicollinearity.

In testing for multicollinearity, VIF were carried out and table 4.6 below exhibit the findings for the years ranging from 2011 to 2015.

Table 4.6: Data Tranche 2 VIF Multicollinearity Statistics

Variable	VIF	1/VIF
FirmSize	1.02	0.978194
Collateral	1.02	0.978583
LendingRate	1	0.995225
Mean VIF	1.02	

In statistics, the general principle is that the VIF values ought to be between 1 and 10. According to this study findings, the VIF values for all the independent variables applied are between 1 and 10. This suggests that the independent variables applied in the study do not have multicollinearity.

4.2.4 Tests for Autocorrelation

In autocorrelation testing amongst the predictor variables, the researcher used the Durbin Watson statistics. As per the findings the Durbin Watson d statistics for the data ranging from the period 2016 to 2020 is $(3, 187) = 2.112197$ while the Durbin Watson d statistics for the data ranging from the period 2011 to 2015 is $(4, 186) = 1.6928934$. Normally, the Durbin Watson statistics is between value 0 and 4. The value of 2 is revealed in instance where there is no autocorrelation. When the Durbin Watson value is between 0 and below 2, this means that positive autocorrelation exists whereas on the other hand a value more than 2 and less than 4 shows that there is negative autocorrelation. A general principle in statistic indicates that when the Durbin Watson statistic ranges between 1.5 to 2.5 it is regarded as relatively normal and value not ranging within there are value which are of concern (Shenoy & Sharma, 2015). However, Field (2009) states that values above 3 and below 1 are a clear reason to be concerned. Nonetheless, the panel data applied in the current study for both time periods does not have serial autocorrelation because the Durbin Watson d statistic values obtained are within the stated threshold.

4.2.5 Unit Root Test

Table 4.7 presents the unit root test findings, which was undertaken on the data series on default rate for the time period ranging from 2016 to 2020.

Table 4.7: Data Tranche 1 Unit Root Test for Default Rate

Fisher-type unit-root test for DefaultRate			
Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots		Number of panels	= 39
Ha: At least one panel is stationary		Avg. number of periods	= 4.79
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Not included			
Drift term: Not included		ADF regressions: 0 lags	
		Statistic	p-value
Inverse chi-squared(78)	P	226.0071	0.0000
Inverse normal	Z	-2.1281	0.0167
Inverse logit t(184)	L*	-6.2616	0.0000
Modified inv. chi-squared	Pm	11.8501	0.0000

According to the null hypothesis, there is unit root in default rate whereas the alternative hypothesis holds that there is stationarity of the variable. Because all the significance value for P, Z, L* and Pm tests are below the study critical value of ($\alpha=0.05$), thus, the null hypothesis is rejected implying that the data is stationary.

Table 4.8 presents the unit root test findings, which was undertaken on the data series on default rate for the time period ranging from 2011 to 2015. According to the null hypothesis, there is unit root in default rate whereas the alternative hypothesis holds that there is stationarity of the variable. Because all the significance value for P, Z, L* and Pm tests are below the study critical value of ($\alpha=0.05$), thus, the null hypothesis is rejected implying that the data is stationary.

Table 4.8: Data Tranche 2 Unit Root Test for Default Rate

Fisher-type unit-root test for DefaultRate			
Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots		Number of panels	= 39
Ha: At least one panel is stationary		Avg. number of periods	= 4.79
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Not included			
Drift term: Not included		ADF regressions: 0 lags	
		Statistic	p-value
Inverse chi-squared(78)	P	226.0071	0.0000
Inverse normal	Z	-2.1281	0.0167
Inverse logit t(184)	L*	-6.2616	0.0000
Modified inv. chi-squared	Pm	11.8501	0.0000

Table 4.9 exhibits the findings of the unit root test done on collateral for the time period ranging from 2016 to 2020.

Table 4.9: Data Tranche 1 Unit Root Test for Collateral

Fisher-type unit-root test for Collateral			
Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots		Number of panels	= 39
Ha: At least one panel is stationary		Avg. number of periods	= 4.79
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Not included			
Drift term: Not included		ADF regressions: 0 lags	
		Statistic	p-value
Inverse chi-squared(78)	P	264.9108	0.0000
Inverse normal	Z	-3.3434	0.0004
Inverse logit t(189)	L*	-8.6291	0.0000
Modified inv. chi-squared	Pm	14.9648	0.0000

According to the null hypothesis, there is unit root in collateral whereas the alternative hypothesis holds that there is stationarity of the variable. Because all the significance value for P, Z, L* and Pm tests are below the study critical value of ($\alpha=0.05$), thus, the null hypothesis is rejected implying that the data is stationary.

Table 4.10 exhibits the findings of the unit root test done on collateral for the time period ranging from 2011 to 2015.

Table 4.10: Data Tranche 2 Unit Root Test for Collateral

Fisher-type unit-root test for Collateral			
Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots		Number of panels	= 39
Ha: At least one panel is stationary		Avg. number of periods	= 4.79
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Not included			
Drift term: Not included		ADF regressions: 0 lags	
		Statistic	p-value
Inverse chi-squared(78)	P	264.9108	0.0000
Inverse normal	Z	-3.3434	0.0004
Inverse logit t(189)	L*	-8.6291	0.0000
Modified inv. chi-squared	Pm	14.9648	0.0000

According to the null hypothesis, there is unit root in collateral whereas the alternative hypothesis holds that there is stationarity of the variable. Because all the significance value for P, Z, L* and Pm tests are below the study critical value of ($\alpha=0.05$), thus, the null hypothesis is rejected implying that the data is stationary.

Table 4.11 exhibits the findings of the unit root test done on lending rate for the time period ranging from 2016 to 2020. According to the null hypothesis, there is unit root in lending rate whereas the alternative hypothesis holds that there is stationarity of the variable. Because all the significance value for P, Z, L* and Pm tests are below the study critical value of ($\alpha=0.05$), thus, the null hypothesis is rejected implying that the data is stationary.

Table 4.11: Data Tranche 1 Unit Root Test for Lending Rate

Fisher-type unit-root test for LendingRate

Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots Number of panels = 39
Ha: At least one panel is stationary Avg. number of periods = 4.79
AR parameter: Panel-specific Asymptotics: T -> Infinity
Panel means: Included
Time trend: Not included
Drift term: Not included ADF regressions: 0 lags

		Statistic	p-value
Inverse chi-squared(78)	P	330.4225	0.0000
Inverse normal	Z	-6.2435	0.0000
Inverse logit t(179)	L*	-12.9524	0.0000
Modified inv. chi-squared	Pm	20.2100	0.0000

Table 4.12 exhibits the findings of the unit root test done on lending rate for the time period ranging from 2011 to 2015.

Table 4.12: Data Tranche 1 Unit Root Test for Lending Rate

Fisher-type unit-root test for LendingRate

Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots Number of panels = 39
Ha: At least one panel is stationary Avg. number of periods = 4.79
AR parameter: Panel-specific Asymptotics: T -> Infinity
Panel means: Included
Time trend: Not included
Drift term: Not included ADF regressions: 0 lags

		Statistic	p-value
Inverse chi-squared(78)	P	330.4225	0.0000
Inverse normal	Z	-6.2435	0.0000
Inverse logit t(179)	L*	-12.9524	0.0000
Modified inv. chi-squared	Pm	20.2100	0.0000

According to the null hypothesis, there is unit root in lending rate whereas the alternative hypothesis holds that there is stationarity of the variable. Because all the significance value for P, Z, L* and Pm tests are below the study critical value of ($\alpha=0.05$), thus, the null hypothesis is rejected implying that the data is stationary.

Table 4.13 exhibits the findings of the unit root test done on bank size for the time period ranging from 2016 to 2020.

Table 4.13: Data Tranche 1 Unit Root Test for Bank Size

Fisher-type unit-root test for FirmSize			
Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots		Number of panels	= 39
Ha: At least one panel is stationary		Avg. number of periods	= 4.79
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Not included			
Drift term: Not included		ADF regressions: 0 lags	
		Statistic	p-value
Inverse chi-squared(78)	P	156.7681	0.0000
Inverse normal	Z	1.0979	0.8639
Inverse logit t(189)	L*	-1.1318	0.1296
Modified inv. chi-squared	Pm	6.3065	0.0000

According to the null hypothesis, there is unit root in bank size whereas the alternative hypothesis holds that there is stationarity of the variable. While both Z, L*'s values are higher than the study critical value of ($\alpha=0.05$). However, both P and Pm's tests values are both lower than the study critical value of ($\alpha=0.05$). The inverse chi-squared and modified inv. chi-squared are chosen in case of dispute in the testing. The null hypothesis is thus dismissed. The data series is stationary.

Table 4.14 exhibits the findings of the unit root test done on bank size for the time period ranging from 2011 to 2015. According to the null hypothesis, there is unit root in bank size whereas the alternative hypothesis holds that there is stationarity of the variable. While both Z, L*'s values are higher than the study critical value of ($\alpha=0.05$). However, both P and Pm's tests values are both lower than the study critical value of ($\alpha=0.05$). The inverse chi-squared

and modified inv. chi-squared are chosen in case of dispute in the testing. The null hypothesis is thus dismissed. The data series is stationary.

Table 4.14: Data Tranche 2 Unit Root Test for Bank Size

Fisher-type unit-root test for FirmSize			
Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots	Number of panels	=	39
Ha: At least one panel is stationary	Avg. number of periods	=	4.79
AR parameter: Panel-specific	Asymptotics:	T ->	Infinity
Panel means:	Included		
Time trend:	Not included		
Drift term:	Not included		
	ADF regressions: 0 lags		
	Statistic	p-value	
Inverse chi-squared(78) P	156.7681	0.0000	
Inverse normal Z	1.0979	0.8639	
Inverse logit t(189) L*	-1.1318	0.1296	
Modified inv. chi-squared Pm	6.3065	0.0000	

4.2.6 Test for Random and Fixed Effects

In determining if the variables had a fixed effect or a random and changing effect overtime, the researcher undertook the Hausman test. Table 4.15 presents the findings on the Hausman test of specification for the time period ranging from 2016 to 2020.

Table 4.15: Data Tranche 1 Hausman Test of Specification

	---- Coefficients ----			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Collateral	-0.46717	0.234857	-0.70202	0.539098
LendingRate	-3.56305	-4.82274	1.2597	3.011149
FirmSize	-2.46295	-0.43376	-2.02919	0.980699

b = consistent under H_0 and H_a ; obtained from xtreg

B = inconsistent under H_a , efficient under H_0 ; obtained from xtreg

Test: H_0 : difference in coefficients not systematic

$$\chi^2(3) = (b-B)'[(V_b - V_B)^{-1}](b-B)$$

$$= 4.91$$

$$\text{Prob} > \chi^2 = 0.1782$$

In this test the null hypothesis was that the variables have random effect whereas the variables have fixed effect was the alternative hypothesis. The null hypothesis would be rejected if the significance value produced is below the alpha value ($\alpha=0.05$) whereas on the contrast it would not be rejected when the significance value is greater the alpha value ($\alpha=0.05$). If the statistics of the Hausman chi-square tests are negative the alternative hypothesis taken since the p value equals asymptotically 1. As indicated by the findings ($\text{Prob} > \chi^2 = 0.1782$), the variables have a random effect and a random effect panel model will be applied. This is a result of the significance value being greater than the alpha value ($\alpha=0.05$), which lead to the null hypothesis not being rejected.

In determining if the variables had a fixed effect or a random and changing effect overtime, the researcher undertook the Hausman test. Table 4.16 presents the findings on the Hausman test of specification for the time period ranging from 2011 to 2015.

Table 4.16: Data Tranche 2 Hausman Test of Specification

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
Collateral	0.009719	0.013793	-0.00407	0.019022
LendingRate	0.13243	0.076311	0.056119	0.131886
FirmSize	-0.02179	-0.0097	-0.01209	0.032697

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

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
 = 0.33
 Prob>chi2 = 0.9551

In this test the null hypothesis was that the variables have random effect whereas the variables have fixed effect was the alternative hypothesis. The null hypothesis would be rejected if the significance value produced is below the alpha value ($\alpha=0.05$) whereas on the contrast it would not be rejected when the significance value is greater the alpha value ($\alpha=0.05$). If the statistics of the Hausman chi-square tests are negative the alternative hypothesis taken since the p value equals asymptotically 1. As indicated by the findings (Prob>chi2=0.1782), the variables have a random effect and a random effect panel model will be applied. This is a result of the significance value being greater than the alpha value ($\alpha=0.05$), which lead to the null hypothesis not being rejected.

4.3 Inferential Statistics

The researcher did the inferential statistics with the aim of establishing the association, direction, and strength of the relationship amongst the independent and control variables utilized in the study on the financial performance. The inferential statistics undertaken consisted of correlation analysis and multiple linear regression analysis.

4.3.1 Correlation Analysis

Correlation analysis indicates the relationship that exist between two variables. The association varies from strong negative correlation to perfect positive correlation. The researcher employed the Pearson correlation analysis to establish the association of the independent and control variables utilized in the study on the financial performance of commercial banks. The study was applied at 95% confidence level and a two tail test was used.

Table 4.17: Data Tranche 1 Correlation Analysis

	DefaultRate	Collateral	LendingRate	FirmSize
DefaultRate	1.0000			
Collateral	0.0013 0.9861	1.0000		
LendingRate	-0.1341 0.0673	0.0149 0.8399	1.0000	
FirmSize	-0.1692* 0.0206	0.1607* 0.0281	-0.0920 0.2105	1.0000

As shown in table 4.17, with significance level at 5%, there is a significant correlation between firm size and default rate. Further, the findings indicate that they are positively correlated. However, at the significance level of 5%, both collateral and lending rate are found not to have a significant correlation with default rate.

Table 4.18: Data Tranche 2 Correlation Analysis

	Default~e	Collat~l	Lending~e	FirmSize
DefaultRate	1.0000			
Collateral	0.0270 0.7146	1.0000		
LendingRate	0.0136 0.8536	0.0431 0.5587	1.0000	
FirmSize	-0.0539 0.4651	0.1376 0.0610	-0.0475 0.5195	1.0000

Table 4.18 displays that with significance level at 5%, collateral, lending rate, and firm size do not have a significant correlation with default rate.

4.3.2 Multiple Linear Regression

The effect of collateral, lending rate, and bank size on the financial performance was established through the random effect panel multiple regression analysis which undertaken at the significance level of 5%. The researcher compared the significance value shown in the ANOVA model with those got from the study. The significance values obtained for the model coefficients were also compared to the significance value of 0.05. Table 4.10 exhibits the findings.

Prior to carrying out the multiple linear regression analysis for the time period ranging from 2016 to 2020, the variables had to be modified as the normality and homoscedasticity criteria were not met. Since all the variables used in the current study did not meet the normality condition, they were standardised in order to correct the non-normality. The "robust standard errors" approach for identifying unbiased standard mistakes in OLS coefficients during heteroscedasticity was used because of the data series of predictors used during the current

study showing heteroscedasticity. Additionally, prior to carrying out the multiple linear regression analysis for the time period ranging from 2011 to 2015, the variables had to be modified as the normality criteria was not met. Since all the variables used in the current study did not meet the normality condition, they were standardised in order to correct the non-normality.

Table 4.19: Data Tranche 1 Random Effects Panel Multiple Linear Regression

```
. xtreg ZDef_Rate ZCollateral ZLending_Rate ZBank_Size, re vce(robust)

Random-effects GLS regression                 Number of obs   =       187
Group variable: A                            Number of groups =        39

R-sq:  within = 0.0179                       Obs per group:  min =         3
         between = 0.1841                       avg =         4.8
         overall = 0.0522                       max =         5

                                           Wald chi2(3)    =         1.40
corr(u_i, X) = 0 (assumed)                   Prob > chi2     =         0.7049

                                           (Std. Err. adjusted for 39 clusters in A)
```

ZDef_Rate	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
ZCollateral	.0271871	.0291507	0.93	0.351	-.0299473	.0843214
ZLending_Rate	-.1528746	.139167	-1.10	0.272	-.4256369	.1198878
ZBank_Size	-.1985983	.1712384	-1.16	0.246	-.5342195	.1370228
_cons	.0019124	.0699282	0.03	0.978	-.1351444	.1389692
sigma_u	.24647314					
sigma_e	.96257758					
rho	.06153016	(fraction of variance due to u_i)				

The R^2 indicates that the variations in the dependent variable (default rate) which emanates from the changes in the independent variables. The overall R^2 value from the findings is 0.0522 which implies that 5.22% of default rate changes are as a result of changes in the model entailing; collateral, lending rate, and bank size. This implied that other variables

which are not incorporated in the model are attributable to the 94.88% of the changes in default rate.

Table 4.19 further illustrates that the model consisting of collateral, lending rate, and bank size does not significantly predict default rate. This is because the significance value obtained for the model (Prob>Chi2=0.7049) is below the study critical value ($\alpha=0.05$). This means that the model entailing collateral, lending rate, and bank size does not significantly forecast default rate.

The results in Table 4.19 finally demonstrate that neither collateral, lending rate, nor bank size has a significant relationship with default rate. This is because their respective significance levels are greater than the study critical value ($\alpha=0.05$).

Table 4.20: Data Tranche 2 Random Effects Panel Multiple Linear Regression

```

Random-effects GLS regression           Number of obs   =       186
Group variable: A                       Number of groups =        37

R-sq:  within = 0.0030                  Obs per group:  min =         5
        between = 0.0515                  avg =         5.0
        overall = 0.0207                  max =         6

                                         Wald chi2(2)     =         0.97
corr(u_i, X) = 0 (assumed)              Prob > chi2      =         0.6155

```

zCollateral	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
zCollateral	0	(omitted)				
zLendingRate	.0165333	.0877297	0.19	0.851	-.1554137	.1884804
zFirmSize	.1046174	.107647	0.97	0.331	-.106367	.3156017
_cons	.002499	.1132449	0.02	0.982	-.219457	.224455
sigma_u	.58511631					
sigma_e	.81882289					
rho	.33802358	(fraction of variance due to u_i)				

The R^2 indicates that the variations in the dependent variable (default rate) which emanates from the changes in the independent variables. The overall R^2 value from the findings is 0.0207 which implies that 2.07% of default rate changes are as a result of changes in the model entailing; collateral, lending rate, and bank size. This implied that other variables which are not incorporated in the model are attributable to the 97.93% of the changes in default rate.

Table 4.20 further illustrates that the model consisting of collateral, lending rate, and bank size does not significantly predict default rate. This is because the significance value obtained for the model ($\text{Prob} > \text{Chi}^2 = 0.6155$) is below the study critical value ($\alpha = 0.05$). This means that the model entailing collateral, lending rate, and bank size does not significantly forecast default rate.

The results in Table 4.20 finally demonstrate that neither collateral, lending rate, nor bank size has a significant relationship with default rate. This is because their respective significance levels are greater than the study critical value ($\alpha = 0.05$).

4.4 Interpretation and Discussion of Findings

This study aimed at finding the connection between collateral and default rate of commercial banks in Kenya. It also aimed at unravelling the impact of the lending rate and bank size on the default rate of commercial banks in Kenya.

The study findings from the years sampled from 2016 to 2020 exhibited that only bank size is significantly correlated at the 5% significance level to default rate. They had a significant positive correlation. Collateral and lending rate have no significant correlation at the 5%

significance level to default rate. The study findings from the years sampled from 2011 to 2015 exhibited that bank size, collateral, and lending rate have no significant correlation at the 5% significance level to default rate. Additional findings from both years sampled from 2016 to 2020 and from 2011 to 2015 were that the model entailing; collateral, lending rate, and bank size explains to a least extent default rate by having a co-efficient of determination of 5.22% and 2.07% respectively. Further findings were that the model entailing; collateral, lending rate, and bank size does not significantly predict the default rate. The final findings were that collateral, lending rate, and bank size did not individually have a significant relationship with default rate.

The current study finding that collateral neither has a significant association nor relationship with default rate is in contradiction to the Akerslof's (1970) asymmetric information theory which implies that collateral is a tool used by commercial banks to collect important information about the borrower's creditworthiness that they could not get any other way. The current study finding also contradicts the formal inspection hypothesis formulated by Leeth and Scott (1989) which stated that when borrowers are identified as high risk, the amount of collateral they pledge increases, resulting in greater credit risk.

However, the current study finding is in agreement to Elsas and Krahen's (2000) finding that collateral does not correlate with loan risk, no matter what top five German banks use as collateral. The current study finding is also congruent to Cressy and Toivanen's (2001) finding that no connection between a bank's default and collateral.

The current study finding contradicts Haselmann and Wachtel's (2007) statement that collateral has been extensively utilized as a means to minimize the asymmetric knowledge

that exists between borrowers and lenders and this reduces the credit risk. The current study finding also contradicts Berger, Frame, and Ioannidou (2016) statement that the presence of collateral-induced selection effects, risk-shifting and loss-mitigation effects in post-facto analyses, or collateral-induced selection effects in post-exposure theories.

The current study finding contradicts Bester (1985) statement that in equilibrium, banks conduct full due diligence on all projects, but fund only the most promising and charge interest that is equal to the cost of funds and the amount of money that is allocated to do the due diligence on the project and the prorated share of the cost of doing due diligence on all rejected projects. Generally, banks relax credit requirements if they are backed by sufficient collateral. Assigned property rights reduce credit risk, however this is only due to a borrower selection impact. The current study finding is also not congruent to Voordeckers and Steijvers (2006) assertion that a primary bank must provide collateral to limit debtors' access to the new loans from other institutions and lower future borrowing risk.

The current study finding contradicts Berger and Udell's (2002) study conducted to identify collateral's significance in defining financial risk among the 460 U.S. banks. The study revealed a positive correlation between loan quality and the amount of collateral needed to secure top five German commercial banks' loans. The current study finding contradicts a study conducted by Chau and Hieu (2018) that sought to know how collateral qualities might influence loan delinquency in Vietnam. The study's result revealed that high-quality collateral enables banks to minimize adverse selection and moral hazard issues, while increasing the credibility of loan applicants.

The current research finding contradicts Pozzolo's (2002) study which investigated the relationship between secured lending and borrowers' riskiness. The research used a theoretical model which showed that banks would discover the optimum strategy to protect themselves from greater credit risk by charging a higher interest rate while demanding a guarantee. According to the research results, the assumptions of the model were confirmed. This is because banks demand more risk for loans with higher loan amounts, smaller credit scores, and with numerous banking connections. In the research results, it was shown that having assets that can be placed as collateral makes it more probable that a loan would be obtained.

The current study finding contradicts Nabawiyah and Amrizah's (2015) research that investigated the social collateral model of Malaysian microfinance institutions. The research proposal supported the social collateral model that involves social capital, group pressure, and training being utilized as a supportive mechanism to help borrowers repay loans and foster human and economic capital development. The results prove that the social collateral model enables microfinance institutions to deliver loans in a smart and efficient manner, while also screening out the capacity of the loan recipients to manage loan repayments, helping the debtors to succeed in microfinance and grow their personal and social well-being.

The current study findings contradicts Wondimagegnehu (2012) research that sought to investigate the determinants of non-performing loans in Ethiopian banks. The study's results showed that debt in which collateral is applied has a much lower risk of defaulting compared to debt in which collateral is not applied. Additionally, the research found that borrowers would honor their loan obligations, provided they used collateral to pledge. The current study findings are also not in tandem to the findings of the study conducted by Japhet and Memba

(2015) on determining if collateral helps decrease loan risk for banks in Kenya. The study established that the lower the likelihood of default for a loan, the higher the amount of liquid and desirable collateral.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The overview of the research results, as well as conclusions and suggestions for policymakers and practitioners, are all included in this section. In addition, the study limitations and recommendations for further research are discussed.

5.2 Summary

The main goal of the current study was to determine the connection collateral and default rate of commercial banks in Kenya. It also aimed at unravelling the impact of the lending rate and bank size on the default rate of commercial banks in Kenya. The analysis of the data collected and the interpretation of the results were therefore carried out in accordance with the stated general and specific goals.

Multiple linear regression and correlation analysis were comprehensively used to achieve the study objectives. The examination of the correlation for the years sampled from 2016 to 2020 exhibited that only bank size is significantly correlated at the 5% significance level to default rate. They had a significant positive correlation. Collateral and lending rate have no significant correlation at the 5% significance level to default rate. However, the examination of the correlation for the years sampled from 2011 to 2015 exhibited that bank size, collateral, and lending rate have no significant correlation at the 5% significance level to default rate. Additional findings from both sampled time periods were that the model entailing; collateral, lending rate, and bank size explains to a least extent default rate by having a co-efficient of determination of 5.22%. Further findings were that the model entailing; collateral, lending rate, and bank size does not significantly predict the default rate.

The final findings were that collateral, lending rate, and bank size did not individually have a significant relationship with default rate.

5.3 Conclusion

This section contains the research's conclusion. The conclusion is written in accordance with the study's overarching objective. The study's broad objective was to determine the connection between collateral and default rate of commercial banks in Kenya. The study concluded that collateral does not significantly impact on the default rate. The study's also sought to determine the effect of lending rate and bank size on the default rate of commercial banks in Kenya. The study concluded that lending rate and bank size do not significantly impact on default rate.

5.4 Recommendations

Those who will conduct future research in the area of finance will benefit from the results of this study in regards to collateral and the default rate. Subsequent researchers interested in collateral and default rate will use the study results as a reference. The study will bring about curiosity among scholars and challenge them into carrying out further studies on commercial banks' default rate. Similarly, the work will provide resourceful material for future scholars and researcher interested in the subject of collateral and the default rate of commercial banks.

Policy recommendations are made to the government officials and policy formulators in the financial sector, mainly the regulator's the Central Bank of Kenya (CBK), Sacco Societies Regulatory Authority (SASRA) and the Treasury, that since it has been established that collateral does not have a significant influence on the default rate, the policy makers should not majorly focus on collateral when trying to mitigate the default rate of financial

institutions. The additional study finding that bank size has a significant positive association with the default rate generates a recommendation to the financial institution regulators to institute policies to increase the banks total assets, for instance, by increasing the core capital requirement. They may try to promote mergers, acquisitions, and amalgamations of financial institutions. The research project findings will serve as a road-map for key government bodies and authorities as they develop policies and procedures to strengthen the financial sector. The current study findings will provide empirical findings to the government and other relevant agency to help guide the formulation and implementation of relevant policies and regulation.

The finding of the study that collateral does not have a significant influence on the default rate generates recommendations to the financial sector practitioners and consultants not to focus on collateral when crafting strategies to mitigate the default rate in their respective financial institutions. However, the finding of the study that bank size has a significant positive association on the default rate generates recommendations to the financial sector practitioners and consultants to focus on bank size when crafting strategies mitigate the default rate. They may opt for mergers, acquisitions, and amalgamations of their respective financial institutions.

5.5 Recommendations for Further Study

To explore the impact of collateral on the default rate is very important for financial sector policy makers, mainly regulators such as SASRA, CBK, and as well as National Treasury, practitioners in the financial sector, and consultants.

However, the current study has been performed in the context of commercial banks; the same study might be repeated on other financial institutions and also across various sectors of the economy to see if the current study results were contained. The present research has been performed solely in Kenya, additional investigations may be carried out in Kenya, in African or global settings to determine if current results of the studies are conveyed.

The present research has solely included the lending interest rate and bank size as the study's control variables. A research may be carried out to see if there are other variables that moderate, intervene, or mediate the connection between exchange rate fluctuations and financial performance.

This study has only utilized secondary data, the study can be followed by studies using primary data. This may either compliment or criticize the current study findings. The statistical analytical techniques of the present research were multiple linear regressions and correlation analyses. Additional methodologies for statistical analysis, for instance; descriptive statistics, cluster analyses, discriminant analysis, granger causality, components analysis, among other methodologies, can be incorporated in further studies.

5.6 Limitations of the Study

The present research was a formal study and it applied the deductive research approach for the reason that it was guided by pertinent literature and theories to further test the theories and empirical literature findings. Employing theories and previous empirical literature assists in laying the groundwork for comprehending the research issue being investigated. However, there was absence of previous researches on the effect of financial technology on access to credit. The research was carried out solely in the Kenyan commercial bank sector in view of

time and financial limitations, which does not clearly demonstrate the present outcome if other financial institutions and other sectors of economy are taken into consideration. In addition, there would be more uncertainty if comparable research were repeated in other nations.

Although the research engaged secondary sources of data, there were some major challenges like some of the data being not readily available; especially data on collateral and it took great lengths and costs to obtain it. The data was not utilized in their raw form and further calculations and manipulations of the data were required. Impending delays were experienced due to data processing and further editing before the compilation by the researcher.

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APPENDICES

Appendix 1: List of Commercial Banks in Kenya as at 30th December 2020

1. Absa Bank Limited
2. African Banking Corp. Ltd
3. Bank of Africa Kenya Ltd
4. Bank of India
5. Bank of Baroda (K) Ltd
6. Stanbic Bank Ltd
7. Chase Bank (K) Ltd (In Receivership)
8. Citibank N.A.
9. Consolidated Bank of Kenya Ltd
10. Co-operative Bank of Kenya Ltd
11. Credit Bank Ltd
12. Development Bank (K) Ltd
13. Diamond Trust Bank (K) Ltd
14. Dubai Bank Ltd (In Receivership)
15. Dubai Islamic Bank (Kenya) Ltd
16. Ecobank Limited
17. Spire Bank
18. Equity Bank Ltd
19. Family Bank Ltd
20. Guaranty Trust Bank
21. First Community Bank Ltd
22. Guardian Bank Ltd
22. Gulf African Bank Ltd

24. Habib Bank A.G. Zurich
25. HFC Ltd
26. Imperial Bank Ltd (In Receivership)
27. I & M Bank Ltd
28. Jamii Bora Bank Ltd
29. KCB Bank Kenya Ltd
30. Mayfair Bank Ltd
31. Middle East Bank (K) Ltd
32. M Oriental Bank Ltd
33. National Bank of Kenya Ltd
34. NCBA Bank Kenya
35. Paramount Universal Bank Ltd
36. Prime Bank Ltd
37. Sidian Bank
38. Standard Chartered Bank (K) Ltd
39. SBM Bank (Kenya) Ltd
40. Transnational Bank Ltd
41. UBA Kenya Bank Ltd
42. Victoria Commercial Bank Ltd

Source: Kenya Bankers Association Website (2020)

Appendix II: Data Collection Form

	Year				
Data	2016	2017	2018	2019	2020
Gross Non-Performing Loans					
Gross Outstanding Loans and Advances					
NPL Ratio					
Fair Value of Collateral					
Collateral					
Interest Income					
Lending Interest Rate					
Financial Assets					
Credit Derivatives					
Total Assets					
Bank Size					

	Year				
Data	2011	2012	2013	2014	2015
Gross Non-Performing Loans					
Gross Outstanding Loans and Advances					
NPL Ratio					
Fair Value of Collateral					
Collateral					
Interest Income					
Lending Interest Rate					
Financial Assets					
Credit Derivatives					
Total Assets					
Bank Size					

Appendix III: Research Data

	Bank	Year	Non-Performing Loans	Total Loans	Default Rate	Fair Value of Collateral	Collateral	Lending Rate	Total Assets	Firm Size
1	ABC Bank	2016	2180457	15292071	0.142587	5032345	0.329082	0.194519	22617744	16.93425
1		2017	2292944	14641988	0.156601	4474840	0.305617	0.219381	22864968	16.94512
1		2018	2909220	15905885	0.182902	4961268	0.311914	0.187899	25586668	17.05758
1		2019	3537734	17786770	0.198897	6559049	0.36876	0.179953	27925990	17.14507
1		2020	2866653	19237311	0.149015	5915973	0.307526	0.172804	29395753	17.19636
2	Bank of Africa	2016	8787673	37798691	0.232486	12391242	0.327822	0.16551	69280267	18.05367
2		2017	8218800	31541959	0.260567	10197011	0.323284	0.206558	55995671	17.84078
2		2018	7712792	27388460	0.281607	8643497	0.315589	0.15062	54191291	17.80803
2		2019	7168734	21188115	0.338338	6789795	0.320453	0.159981	49080859	17.70898
2		2020	6614957	15982158	0.413896	3460585	0.216528	0.183092	43996118	17.59961
3	Bank of Baroda	2016	2140994	28379555	0.075441	1.11E+08	3.923388	0.267516	68177548	18.03763
3		2017	3077933	36400900	0.084557	22229920	0.610697	0.263389	82907475	18.23324
3		2018	2475022	42207282	0.05864	27258433	0.645823	0.247482	96132100	18.38123
3		2019	3668292	41570848	0.088242	28817535	0.693215	0.281511	123014401	18.62781
3		2020	3887612	46941977	0.082817	30733710	0.654717	0.293666	143311335	18.78053
4	Barclays Bank	2016	6123678	145838000	0.04199	53674509	0.368042	0.173382	240877000	19.2998
4		2017	8782749	168510000	0.05212	60200535	0.357252	0.166881	259718000	19.37511
4		2018	9358657	168397000	0.055575	60718233	0.360566	0.161352	271572000	19.41974
4		2019	10823585	177354000	0.061028	58113408	0.327669	0.16386	325313000	19.6003
4		2020	10917274	194894941	0.056016	64972906	0.333374	0.159183	373981781	19.73972
5	Bank of India	2016	361575	17857613	0.020248	15107112	0.845976	0.209587	42162947	17.55705
5		2017	268329	19246080	0.013942	17604601	0.914711	0.229779	47815075	17.68285
5		2018	427663	20641381	0.020719	18152216	0.879409	0.251205	56630656	17.85206
5		2019	1314690	18426559	0.071348	16185908	0.878401	0.314538	62689134	17.9537
5		2020	1204112	12870025	0.093559	12463358	0.968402	0.458003	62543244	17.95137

6	Citibank	2016	1545051	26628660	0.058022	15084976	0.566494	0.270416	88147287	18.29452
6		2017	526900	27436980	0.019204	14467629	0.527304	0.266475	103323540	18.45338
6		2018	1368733	37187236	0.036807	19002715	0.511001	0.173482	98231911	18.40284
6		2019	428686	26435800	0.016216	14611754	0.552726	0.241827	85638687	18.26565
6		2020	668159	26024709	0.025674	14131937	0.54302	0.23784	96570193	18.38578
7	Commercial Bank of Africa	2016	10961988	103519861	0.105893	37108972	0.358472	0.219098	215625182	19.18905
7		2017	8323348	111650821	0.074548	41198036	0.36899	0.186968	229334551	19.25069
7		2018	9443318	113642338	0.083097	39357524	0.346328	0.170817	245779025	19.31994
8	Consolidated bank	2016	9689657	121503411	0.079748	38226917	0.314616	0.141242	13624528	16.42738
8		2017	510209	9221256	0.05533	1731448	0.187767	0.212272	14135528	16.4642
8		2018	1077130	9161484	0.117572	1448018	0.158055	0.18248	13917895	16.44869
8		2019	1286270	8421072	0.152744	857214.6	0.101794	0.159677	13455744	16.41492
8		2020	1292256	8429659	0.153299	472785.9	0.056086	0.166254	12887332	16.37176
9	Credit bank	2016	1892390	7369033	0.256803	1993191	0.270482	0.16507	11861651	16.28882
9		2017	452421	7087728	0.063832	2199124	0.310272	0.171914	10287085	16.1464
9		2018	570204	7899394	0.072183	3609636	0.456951	0.199318	12237889	16.32005
9		2019	730857	9698546	0.075357	2865406	0.295447	0.158098	14510677	16.4904
9		2020	943737	13031250	0.072421	3780861	0.290138	0.140664	17904609	16.70057
10	Co-operative bank of Kenya	2016	1325082	15226683	0.087024	4555169	0.299157	0.141338	216606160	19.19359
10		2017	7130565	208571920	0.034188	52478364	0.251608	0.176396	342499809	19.65178
10		2018	10145240	260153437	0.038997	1.18E+08	0.455361	0.162461	351828577	19.67865
10		2019	17812836	287371708	0.061985	1.3E+08	0.453654	0.140491	386857657	19.77357
10		2020	24753283	245410302	0.100865	79403485	0.323554	0.175318	413670710	19.84058
11	Development Bank of Kenya	2016	26122319	266712696	0.097942	80297858	0.301065	0.16362	15700894	16.56923
11		2017	2271625	8733212	0.260113	4381173	0.501668	0.200401	16411435	16.61349
11		2018	1930383	9199779	0.209829	4333381	0.471031	0.159496	16309057	16.60723
11		2019	2499849	8386697	0.298073	3896116	0.464559	0.171224	15323111	16.54487

12	Diamond Trust Bank	2016	2922809	7911046	0.369459	4978769	0.629344	0.168606	153580697	18.84974
12		2017	4274897	177544871	0.024078	51962412	0.292672	0.145457	271608597	19.41987
12		2018	6052824	186303191	0.032489	68948389	0.370087	0.181494	328044501	19.60866
12		2019	13050400	196048155	0.066567	74542606	0.380226	0.176634	363303400	19.71075
12		2020	12145324	193074357	0.062905	81506726	0.422152	0.182668	377719314	19.74966
13	Dubai Bank	2017	13604721	199089371	0.068335	83273708	0.418273	0.165007	2430621	14.70366
13		2018	11204560	290621	38.55386	116542.2	0.401011	0.045289	2610309	14.77498
13		2019	7958	2131658	0.003733	1274832	0.598047	0.083927	5250614	15.47386
13		2020	48168	5065169	0.00951	1504963	0.29712	0.083912	8987918	16.01139
14	Ecobank	2016	1841602	29621166	0.062172	14785316	0.499147	0.141605	52426513	17.77492
14		2017	3984801	24473512	0.162821	9516476	0.388848	0.105043	47123839	17.66829
14		2018	6171217	16370967	0.376961	5235206	0.319786	0.224996	53455760	17.79436
14		2019	2259710	13022796	0.17352	4321263	0.331823	0.207989	54463878	17.81305
14		2020	3095001	21377402	0.144779	6352988	0.2971824	0.2341	75377851	18.13802
15	Equity Bank	2016	7327662	269892942	0.02715	95927352	0.3554274	0.164541	428062514	19.87478
15		2017	16717199	266068089	0.062831	1.09E+08	0.4080839	0.152809	473713133	19.97611
15		2018	15442413	279091669	0.055331	89153224	0.3194406	0.155957	524465745	20.07789
15		2019	21094581	297227000	0.070971	84883806	0.2855858	0.18438	573384000	20.16707
15		2020	31974770	366440456	0.087258	1.28E+08	0.3487672	0.153763	673682541	20.32827
16	Family bank	2016	1393019	37925476	0.03673	10804434	0.2848859	0.163911	81281366	18.21343
16		2017	6002839	50163555	0.119665	12793395	0.2550337	0.161642	69491684	18.05672
16		2018	8360108	43471853	0.192311	9910064	0.2279651	0.157794	69134935	18.05157
16		2019	7135322	44113093	0.161751	8794830	0.1993701	0.160227	67011065	18.02037
16		2020	7127220	50594439	0.14087	13294956	0.262775	0.108264	78857125	18.18315
17	First Community Bank	2016	2566084	10940003	0.23456	3754361	0.3431773	0.196169	14564631	16.49411
17		2017	3495479	10939122	0.319539	4034604	0.3688234	0.305349	14962089	16.52103
17		2018	3966687	9726807	0.40781	3002509	0.308684	0.322912	17359968	16.66968

17		2019	4406893	9027389	0.488169	3379092	0.3743156	0.346607	17880462	16.69922
17		2020	4107751	9909696	0.414518	3823428	0.385827	0.327358	18762844	16.74739
18	Guaranty Trust Bank	2016	1796422	19606520	0.091624	6512870	0.3321788	0.184021	40964878	17.52823
18		2017	2153878	19441803	0.110786	7739393	0.39808	0.178626	32165405	17.2864
18		2018	2235804	20542673	0.108837	7584335	0.369199	0.180283	31877965	17.27743
18		2019	2886814	19681830	0.146674	5977056	0.303684	0.163834	37944853	17.45164
18		2020	2258352	20716760	0.109011	3451420	0.1666004	0.166687	29082395	17.18564
19	Guardian Bank	2016	281032	9242735	0.030406	2657027	0.2874719	0.422988	14609492	16.49718
19		2017	151685	8974527	0.016902	2076438	0.2313702	0.457356	14705350	16.50372
19		2018	435271	9616965	0.045261	2174480	0.2261087	0.539705	15802759	16.5757
19		2019	683411	9028027	0.075699	2837128	0.3142578	0.439201	16185963	16.59965
19		2020	627251	9102560	0.068909	3154037	0.3465	0.484201	16386450	16.61197
20	Gulf African Bank	2016	1299174	15427705	0.08421	7031645	0.4557804	0.283247	24706595	17.02258
20		2017	1494067	16193046	0.092266	5523793	0.3411213	0.263652	27156264	17.11712
20		2018	1799940	19384156	0.092856	5830467	0.3007852	0.2555	31316228	17.25965
20		2019	2404231	22605853	0.106354	8287461	0.3666069	0.276363	33325575	17.32184
20		2020	3478778	22673040	0.153432	5676655	0.2503703	0.27151	35122982	17.37437
21	Habib Bank Ltd	2016	312382	3946146	0.079161	555009.3	0.1406459	0.179236	10229979	16.14083
21		2017	713263	3812504	0.187085	708483.3	0.1858315	0.184495	12508025	16.34188
21		2018	468332	6286399	0.074499	308846.5	0.0491293	0.173164	21520666	16.88452
21		2019	617660	6698672	0.092206	654694.3	0.0977349	0.157308	24823459	17.0273
21		2020	2319103	53021022	0.043739	4758101	0.0897399	0.093884	31659434	17.27055
22	Housing finance Company ltd	2016	3771813	54469605	0.069246	28599870	0.5250611	0.079028	71930140	18.09121
22		2017	5365761	49639639	0.108094	25363829	0.5109592	0.050897	67541116	18.02825
22		2018	10832833	43439691	0.249376	23674932	0.5450069	0.028043	60549350	17.91897
22		2019	9084548	38551968	0.235644	18525738	0.4805394	0.135241	56454918	17.84895
22		2020	3171478	127823778	0.024811	57942489	0.4532998	0.155136	61723542	17.93818

23	I&M Bank	2016	3891520	134675332	0.028896	33030196	0.245258	0.228475	210542393	19.1652
23		2017	13307822	153018152	0.086969	74198939	0.4849029	0.147724	240110741	19.29661
23		2018	15926344	147623509	0.107885	58724990	0.3978024	0.145069	248639566	19.33151
23		2019	15339882	156768746	0.09785	43372559	0.2766659	0.149579	274027749	19.42874
23		2020	525542	10155694	0.051749	2332843	0.2297079	0.21258	216781543	19.1944
24	Jamii Bora Bank Ltd	2016	1609057	9356471	0.171973	5971101	0.6381788	0.22768	15779873	16.57425
24		2017	1106163	8310978	0.133097	5526578	0.6649732	0.226827	12882646	16.37139
24		2018	15425647	345968686	0.044587	2.11E+08	0.6089003	0.161777	13580941	16.42418
25	KCB Bank	2016	27202975	385745331	0.070521	2.55E+08	0.660352	0.150532	19523964	16.78715
25		2017	32371150	422684637	0.076585	2.42E+08	0.5732266	0.250834	24666893	17.02097
25		2018	28572777	455880284	0.062676	1.77E+08	0.3890435	0.235516	27143125	17.11663
25		2019	54411769	535370260	0.101634	1.75E+08	0.3275884	0.232279	28985722	17.18231
25		2020	574987	3616626	0.158984	595169.6	0.1645649	0.314672	25233522	17.04368
26	Middle East Bank (K) Ltd	2017	500314	2769120	0.180676	387595.3	0.1399706	0.146336	5121036	15.44887
26		2018	979273	2560398	0.382469	455885.9	0.1780527	0.185044	5360864	15.49464
26		2019	819395	5964756	0.137373	1133797	0.1900826	0.190113	8466284	15.9516
26		2020	545199	6638054	0.082132	1099359	0.1656147	0.211076	9920247	16.11009
27	M-Oriental bank ltd	2017	522138	7272765	0.071794	388756.4	0.0534537	0.209136	10576525	16.17415
27		2018	705105	7502022	0.093989	1843281	0.2457046	0.700506	10515015	16.16831
27		2019	1315601	6811799	0.193136	3150783	0.4625478	0.299024	12393776	16.3327
27		2020	7569018	67803990	0.111631	35994578	0.5308622	0.14856	12544031	16.34476
28	National Bank of Kenya	2016	9625269	55019784	0.174942	19947357	0.3625488	0.249574	112086130	18.53478
28		2017	15712346	52361043	0.300077	15034030	0.2871224	0.194424	109873140	18.51484
28		2018	18696293	47778777	0.39131	11268144	0.2358399	0.159893	114849105	18.55913
28		2019	16348780	45871701	0.356402	34558960	0.753383	0.165912	112028747	18.53427
28		2020	10451906	114657644	0.091158	86218018	0.7519605	0.162189	165788268	18.92622
29	NIC Plc bank	2016	12883832	114466274	0.112556	91499700	0.7993595	0.201658	169458985	18.94812

29		2017	13038800	119760537	0.108874	92397282	0.7715169	0.196603	206172460	19.14422
29		2018	14301298	116853003	0.122387	95593374	0.8180652	0.20407	208407417	19.15501
29		2019	304891	5871717	0.051925	821919.1	0.1399793	0.159341	210525709	19.16512
29		2020	479961	5799443	0.08276	1565979	0.2700222	0.19793	229427841	19.2511
30	Paramount Bank Ltd	2016	623315	5902031	0.10561	2200814	0.3728909	0.14411	9541086	16.07112
30		2017	743922	5642627	0.13184	1212421	0.2148682	0.207807	9886573	16.10669
30		2018	782931	6462964	0.121141	2357765	0.3648117	0.198567	10443296	16.16147
30		2019	697679	41047741	0.016997	20650223	0.5030782	0.195214	15001313	16.52365
30		2020	1423391	39356307	0.036167	23778175	0.604177	0.186861	15335455	16.54568
31	Prime Bank	2016	1895198	38965591	0.048638	28143920	0.7222762	0.114513	77987909	18.17206
31		2017	2229699	36776526	0.060628	28121965	0.7646716	0.139918	100135959	18.42204
31		2018	3767500	37006358	0.101807	31113342	0.8407567	0.153381	108785527	18.50489
31		2019	10586246	103304956	0.102476	84713963	0.8200377	0.091142	145795560	18.79772
31		2020	4306872	4876333	0.883219	3851942	0.7899259	0.080966	196972042	19.09857
32	SBM Bank	2016	3207495	4399953	0.728984	3476395	0.7900982	0.264889	171153331	18.95807
32		2017	15291505	12206233	1.252762	9616704	0.7878519	0.254691	170654062	18.95515
32		2018	13176185	15463645	0.852075	8971816	0.5801876	0.238727	172519356	18.96602
32		2019	1607630	12519387	0.128411	6272103	0.5009912	0.259711	191065562	19.06813
32		2020	3200943	13434572	0.238262	7707728	0.5737234	0.242833	208754994	19.15667
33	Sidian Bank	2016	3171556	11409325	0.277979	3600434	0.3155694	0.176306	19301752	16.77571
33		2017	2673011	13134315	0.203514	3313620	0.2522872	0.190423	25308924	17.04667
33		2018	2859368	14526066	0.196844	2158621	0.1486033	0.202165	26451638	17.09083
33		2019	4170438	101576227	0.041057	26076483	0.2567184	0.227466	20845191	16.85263
33		2020	5834603	115587723	0.050478	31201275	0.2699359	0.222006	21468272	16.88209
34	Stanbic Bank Kenya Ltd	2016	8694793	130535814	0.066608	67692828	0.5185767	0.157663	248738719	19.33191
34		2017	13852115	146604117	0.094487	74212203	0.5062082	0.187195	280953012	19.4537
34		2018	15248539	152813955	0.099785	75091541	0.4913919	0.162031	292705136	19.49468

34		2019	11681664	115125427	0.101469	66221281	0.5752099	0.186614	233965447	19.27068
34		2020	10166807	122711038	0.082852	64919926	0.5290472	0.171101	250482000	19.3389
35	Standard Chartered Bank	2016	11317708	126294470	0.089614	30470586	0.2412662	0.321331	285724441	19.47054
35		2017	13871270	118651550	0.116908	24872911	0.2096299	0.391134	285404023	19.46942
35		2018	12269630	128690341	0.095342	23673451	0.1839567	0.246332	302139056	19.5264
35		2019	2772437	8321620	0.333161	520740	0.0625768	0.272905	314469562	19.5664
35		2020	1246425	7433605	0.167674	871391	0.1172232	0.181272	313802498	19.56427
36	Spire Bank Ltd	2016	2237236	5238814	0.42705	1483373	0.2831506	0.176875	11147949	16.22677
36		2017	2488611	4445622	0.559789	1117498	0.2513706	0.170027	9223078	16.03722
36		2018	2355173	3311899	0.711125	949206.4	0.2866049	0.153417	6860301	15.74126
36		2019	733408	6649506	0.110295	1814549	0.2728848	0.145589	10452691	16.16237
36		2020	736146	6367429	0.115611	1803376	0.2832189	0.202042	10372441	16.15466
37	Transnational Bank	2016	1595247	6604120	0.241553	1410892	0.2136381	0.181518	10241368	16.14195
37		2017	1464956	6625522	0.221108	6107230	0.9217734	0.185797	10235524	16.14137
37		2018	1749497	6123829	0.285687	1274011	0.2080415	0.179194	19318142	16.77656
37		2019	49137	2733280	0.017977	689529.4	0.2522718	0.215617	17781237	16.69365
37		2020	56752	3058201	0.018557	756571	0.2473909	0.162514	15601281	16.56286
38	UBA Kenya Bank Ltd	2016	142481	3270289	0.043568	685518.6	0.2096202	0.200811	6504732	15.68804
38		2017	440027	3447577	0.127634	722550	0.209582	0.193273	15332118	16.54546
38		2018	882862	3629616	0.243238	790405.9	0.2177657	0.153645	16088319	16.5936
38		2019	432129	13124420	0.032926	2804173	0.2136607	0.180076	20020072	16.81225
38		2020	389437	15292829	0.025465	3118860	0.2039426	0.166289	22403481	16.92473
39	Victoria Commercial Bank	2016	15159	18870101	0.000803	3982050	0.2110243	0.195452	25985160	17.07304
39		2017	696424	22586671	0.030833	4896170	0.2167725	0.190266	32336955	17.29172
39		2018	1204434	23789164	0.05063	4769979	0.2005106	0.393285	36072410	17.40104
39		2019	1992722	28467456	0.07	6075481	0.2134185	0.570802	42376529	17.56211
39		2020	2657039	29854372	0.089	7040956	0.2358434	0.449372	45698727	17.63758

		Year	Non-Performing Loans	Total Loans	Default Rate	Fair Value of Collateral	Collateral	Lending Rate	Total Assets	Firm Size
1	ABC Bank	2011	2006020	13304102	0.150782	4126523	0.283011	0.208135	18094195	16.7111
1		2012	2109508	12738530	0.165601	3669369	0.262831	0.234738	18291974	16.72197
1		2013	2676482	13838120	0.193414	4068240	0.268246	0.201052	20469334	16.83444
1		2014	3254715	15474490	0.210328	5378420	0.317134	0.19255	22340792	16.92192
1		2015	2637321	16736461	0.157579	4851098	0.264472	0.1849	23516602	16.97322
2	Bank of Africa	2011	8084659	32884861	0.245847	10160819	0.281927	0.177096	55424214	17.83053
2		2012	7561296	27441504	0.275542	8361549	0.278024	0.221017	44796537	17.61764
2		2013	7095769	23827960	0.297792	7087667	0.271407	0.161163	43353033	17.58489
2		2014	6595235	18433660	0.357782	5567632	0.27559	0.17118	39264687	17.48584
2		2015	6085760	13904477	0.437684	2837679	0.186214	0.195908	35196894	17.37647
3	Bank of Baroda	2011	1969714	24690213	0.079777	91302085	3.374114	0.286242	54542038	17.81448
3		2012	2831698	31668783	0.089416	18228535	0.525199	0.281826	66325980	18.01009
3		2013	2277020	36720335	0.06201	22351915	0.555408	0.264806	76905680	18.15809
3		2014	3374829	36166638	0.093313	23630379	0.596165	0.301217	98411521	18.40467
3		2015	3576603	40839520	0.087577	25201642	0.563057	0.314223	114649068	18.55739
4	Barclays Bank	2011	5633784	126879060	0.044403	44013098	0.316516	0.185519	192701600	19.07665
4		2012	8080129	146603700	0.055115	49364438	0.307237	0.178563	207774400	19.15196
4		2013	8609964	146505390	0.058769	49788951	0.310087	0.172647	217257600	19.19659
4		2014	9957698	154297980	0.064536	47652994	0.281795	0.17533	260250400	19.37715
4		2015	10043892	169558599	0.059236	53277783	0.286702	0.170326	299185425	19.51657
5	Bank of India	2011	332649	15536123	0.021411	12387832	0.727539	0.224258	33730358	17.33391
5		2012	246862.7	16744090	0.014743	14435773	0.786651	0.245864	38252060	17.45971
5		2013	393450	17958001	0.021909	14884817	0.756292	0.268789	45304525	17.62892
5		2014	1209515	16031106	0.075448	13272444	0.755425	0.336556	50151307	17.73056
5		2015	1107783	11196922	0.098936	10219954	0.832826	0.490063	50034595	17.72823
6	Citibank	2011	1421447	23166934	0.061357	12369680	0.487185	0.289345	70517830	18.07138
6		2012	484748	23870173	0.020308	11863456	0.453481	0.285128	82658832	18.23023

6		2013	1259234	32352895	0.038922	15582226	0.439461	0.185626	78585529	18.1797
6		2014	394391.1	22999146	0.017148	11981638	0.475344	0.258755	68510950	18.0425
6		2015	614706.3	22641497	0.02715	11588189	0.466997	0.254489	77256154	18.16264
7	Commercial Bank of Africa	2011	10085029	90062279	0.111978	30429357	0.308286	0.234435	172500146	18.96591
7		2012	7657480	97136214	0.078832	33782390	0.317331	0.200056	183467641	19.02755
7		2013	8687853	98868834	0.087873	32273169	0.297842	0.182774	196623220	19.0968
7		2014	7452465	99734524	0.074723	23438935	0.24876	0.17632	204622320	19.13668
7		2015	6433298	103246383	0.06231	32748634	0.26324	0.163465	212423470	19.17409
8	Consolidated bank	2011	8914484	105707968	0.084331	31346072	0.27057	0.151129	10899622	16.20424
8		2012	469392.3	8022492.7	0.05851	1419787	0.16148	0.227131	11308422	16.24106
8		2013	990959.6	7970491.1	0.124329	1187375	0.135927	0.195254	11134316	16.22554
8		2014	1183368	7326332.6	0.161523	702916	0.087543	0.170854	10764595	16.19177
8		2015	1188876	7333803.3	0.162109	387684.4	0.048234	0.177892	10309866	16.14861
9	Credit bank	2011	1740999	6411058.7	0.271562	1634416	0.232615	0.176625	9489320.8	16.06568
9		2012	416227.3	6166323.4	0.0675	1803281	0.266834	0.183948	8229668	15.92326
9		2013	524587.7	6872472.8	0.076332	2959902	0.392978	0.21327	9790311.2	16.0969
9		2014	672388.4	8437735	0.079688	2349633	0.254084	0.169165	11608542	16.26725
9		2015	868238	11337188	0.076583	3100306	0.249519	0.15051	14323687	16.47743
10	Co-operative bank of Kenya	2011	1219075	13247214	0.092025	3735238	0.257275	0.151232	173284928	18.97045
10		2012	6560120	181457570	0.036152	43032258	0.216383	0.188744	273999847	19.42864
10		2013	9333621	226333490	0.041238	97140258	0.39161	0.173833	281462862	19.45551
10		2014	16387809	250013386	0.065548	1.07E+08	0.390142	0.150325	309486126	19.55042
10		2015	22773020	213506963	0.106662	65110858	0.278256	0.18759	330936568	19.61744
11	Development Bank of Kenya	2011	24032533	232040046	0.103571	65844243	0.258916	0.175073	12560715	16.34608
11		2012	2089895	7597894.4	0.275062	3592562	0.431434	0.214429	13129148	16.39035
11		2013	1775952	8003807.7	0.221888	3553373	0.405087	0.170661	13047246	16.38409
11		2014	2299861	7296426.4	0.315204	3194815	0.399521	0.18321	12258489	16.32173

11		2015	2323412	7784623.5	0.298462	3104321	0.353213	0.17452	12034530	16.30329
12	Diamond Trust Bank	2011	3242324	135463280	0.023935	41278132	0.213476	0.124514	196743237	19.09741
12		2012	3932905	154464038	0.025462	42609178	0.251698	0.155639	217286878	19.19673
12		2013	5568598	162083776	0.034356	56537679	0.318275	0.194199	262435601	19.38552
12		2014	12006368	170561895	0.070393	61124937	0.326994	0.188998	290642720	19.48761
12		2015	11173698	167974691	0.06652	66835515	0.363051	0.195455	302175451	19.52652
13	Dubai Bank	2011	13424365	142362344	0.094297	52346234	0.363412	0.12543	1745060	14.3723
13		2012	12516343	173207753	0.072262	68284441	0.359715	0.176557	1944496.8	14.48051
13		2013	10308195	252840000	0.04077	95564.62	0.344869	0.048459	2088247.2	14.55184
13		2014	7321.36	1854542.5	0.003948	1045362	0.51432	0.089802	4200491.2	15.25071
13		2015	44314.56	4406697	0.010056	1234070	0.255523	0.089786	7190334.4	15.78825
14	Ecobank	2011	1694274	25770414	0.065745	12123959	0.429266	0.151517	41941210	17.55178
14		2012	3666017	21291955	0.172178	7803510	0.334409	0.112396	37699071	17.44515
14		2013	5677520	14242741	0.398625	4292869	0.275016	0.240746	42764608	17.57122
14		2014	6032313	13561340	0.444817	3451630	0.256023	0.257631	45672311	17.637
14		2015	7235682	12578930	0.575222	2974210	0.247901	0.27653	47545231	17.67719
15	Equity Bank	2011	6741449	234806860	0.028711	78660429	0.305668	0.176059	342450011	19.65164
15		2012	15379823	231479237	0.066441	89034040	0.350952	0.163505	378970506	19.75297
15		2013	14207020	242809752	0.058511	73105643	0.274719	0.166874	419572596	19.85475
15		2014	19407015	258587490	0.07505	69604721	0.245604	0.197286	458707200	19.94392
15		2015	29416788	318803197	0.092273	1.05E+08	0.29994	0.164526	538946033	20.10513
16	Family bank	2011	1281577	32995164	0.038841	8859636	0.245002	0.175385	65025093	17.99028
16		2012	5522612	43642293	0.126543	10490584	0.219329	0.172957	55593347	17.83357
16		2013	7691299	37820512	0.203363	8126252	0.19605	0.16884	55307948	17.82843
16		2014	6564496	38378391	0.171047	7211761	0.171458	0.171442	53608852	17.79722
16		2015	6557042	44017162	0.148966	10901864	0.225987	0.115842	63085700	17.96
17	First Community Bank	2011	2360797	9517802.6	0.24804	3078576	0.295133	0.209901	11651705	16.27096

17		2012	3215841	9517036.1	0.337904	3308375	0.317188	0.326723	11969671	16.29789
17		2013	3649352	8462322.1	0.431247	2462058	0.265468	0.345515	13887974	16.44653
17		2014	4054342	7853828.4	0.516225	2770856	0.321911	0.37087	14304370	16.47608
17		2015	3779131	8621435.5	0.438341	3135211	0.331811	0.350273	15010275	16.52425
18	Guaranty Trust Bank	2011	1652708	17057672	0.096889	5340554	0.285674	0.196903	32771902	17.30508
18		2012	1981568	16914369	0.117153	6346302	0.342349	0.19113	25732324	17.06326
18		2013	2056940	17872126	0.115092	6219155	0.317511	0.192903	25502372	17.05428
18		2014	2655869	17123192	0.155104	4901186	0.261168	0.175303	30355882	17.2285
18		2015	2077684	18023581	0.115276	2830165	0.143276	0.178355	23265916	16.9625
19	Guardian Bank	2011	258549.4	8041179.5	0.032153	2178762	0.247226	0.452597	11687594	16.27404
19		2012	139550.2	7807838.5	0.017873	1702679	0.198978	0.48937	11764280	16.28058
19		2013	400449.3	8366759.6	0.047862	1783073	0.194454	0.577484	12642207	16.35255
19		2014	628738.1	7854383.5	0.080049	2326445	0.270262	0.469945	12948770	16.37651
19		2015	577070.9	7919227.2	0.07287	2586310	0.29799	0.518095	13109160	16.38882
20	Gulf African Bank	2011	1195240	13422103	0.08905	5765949	0.391971	0.303074	19765276	16.79944
20		2012	1374542	14087950	0.097569	4529510	0.293364	0.282108	21725011	16.89397
20		2013	1655945	16864216	0.098193	4780983	0.258675	0.273385	25052982	17.0365
20		2014	2211893	19667092	0.112467	6795718	0.315282	0.295708	26660460	17.09869
20		2015	3200476	19725545	0.16225	4654857	0.215318	0.290516	28098386	17.15122
21		2016	287391.4	3433147	0.083711	455107.7	0.120955	0.191782	8183983.2	15.91769
21	Habib Bank Ltd	2011	656202	3316878.5	0.197837	580956.3	0.159815	0.19741	10006420	16.11874
21		2012	430865.4	5469167.1	0.078781	253254.1	0.042251	0.185285	17216533	16.66138
21		2013	568247.2	5827844.6	0.097506	536849.3	0.084052	0.16832	19858767	16.80416
21		2014	2133575	46128289	0.046253	3901643	0.077176	0.100455	25327547	17.0474
21		2015	3470068	47388556	0.073226	23451894	0.451553	0.08456	57544112	17.86806
22	Housing finance Company ltd	2011	2078933	11329833	0.183492	3543436	0.285368	0.222548	43571102	17.5899
22		2012	4936500	43186486	0.114307	20798340	0.439425	0.05446	54032893	17.8051

22		2013	9966206	37792531	0.263708	19413445	0.468706	0.030006	48439480	17.69583
22		2014	8357784	33540212	0.249187	15191105	0.413264	0.144708	45163934	17.62581
22		2015	2917760	111206687	0.026237	47512841	0.389838	0.165996	49378834	17.71503
23	I&M Bank	2011	3580198	117167539	0.030556	27084761	0.210922	0.244469	168433914	18.94205
23		2012	12243196	133125792	0.091967	60843130	0.417016	0.158064	192088593	19.07347
23		2013	14652236	128432453	0.114085	48154492	0.34211	0.155224	198911653	19.10837
23		2014	14112691	136388809	0.103474	35565499	0.237933	0.160049	219222199	19.2056
23		2015	483498.6	8835453.8	0.054723	1912931	0.197549	0.227461	173425234	18.97126
24	Jamii Bora Bank Ltd	2011	1480332	8140129.8	0.181856	4896303	0.548834	0.243618	12623898	16.3511
24		2012	1017670	7230550.9	0.140746	4531794	0.571877	0.242705	10306117	16.14825
24		2013	14191595	300992757	0.047149	1.73E+08	0.523654	0.173101	10864753	16.20103
24		2014	25026737	335598438	0.074573	2.09E+08	0.567903	0.16107	15619171	16.56401
24		2015	29781458	367735634	0.080986	1.99E+08	0.492975	0.268392	19733514	16.79783
25	KCB Bank	2011	2847401	18598340	0.1531	5209451	0.255577	0.250487	60302281	17.91488
25		2012	460288.9	2409134.4	0.19106	317828.2	0.120375	0.15658	4096828.8	15.22572
25		2013	900931.2	2227546.3	0.40445	373826.4	0.153125	0.197997	4288691.2	15.27149
25		2014	753843.4	5189337.7	0.145268	929713.1	0.163471	0.203421	6773027.2	15.72846
25		2015	501583.1	5775107	0.086853	901474.8	0.142429	0.225851	7936197.6	15.88694
26	National Bank of Kenya	2011	8855247	47867212	0.184996	16356833	0.311792	0.267044	89668904	18.31163
26		2012	14455358	45554107	0.317323	12327904	0.246925	0.208034	87898512	18.29169
26		2013	17200590	41567536	0.413799	9239878	0.202822	0.171085	91879284	18.33599
26		2014	15040878	39908380	0.376885	28338347	0.647909	0.177525	89622998	18.31112
26		2015	9615754	99752150	0.096396	70698775	0.646686	0.173542	132630614	18.70308
27	NIC Plc bank	2011	11853125	99585658	0.119024	75029754	0.687449	0.215774	135567188	18.72498
27		2012	11995696	104191667	0.115131	75765771	0.663505	0.210365	164937968	18.92108
27		2013	13157194	101662113	0.129421	78386567	0.703536	0.218355	166725934	18.93186
27		2014	280499.7	5108393.8	0.05491	673973.7	0.120382	0.170495	168420567	18.94197
27		2015	441564.1	5045515.4	0.087516	1284102	0.232219	0.211785	183542273	19.02796

28	Paramount Bank Ltd	2011	573449.8	5134767	0.11168	1804667	0.320686	0.154197	7632868.8	15.84797
28		2012	684408.2	4909085.5	0.139417	994185.5	0.184787	0.222354	7909258.4	15.88354
28		2013	720296.5	5622778.7	0.128103	1933367	0.313738	0.212467	8354636.8	15.93833
28		2014	641864.7	35711535	0.017974	16933183	0.432647	0.208879	12001050	16.3005
28		2015	1309520	34239987	0.038245	19498104	0.519592	0.199941	12268364	16.32253
29	Prime Bank	2011	1743582	33900064	0.051433	23078014	0.621158	0.122529	62390327	17.94892
29		2012	2051323	31995578	0.064113	23060011	0.657618	0.149712	80108767	18.1989
29		2013	3466100	32195531	0.107658	25512940	0.723051	0.164117	87028422	18.28175
29		2014	9739346	89875312	0.108365	69465449	0.705232	0.097522	116636448	18.57457
29		2015	3962322	4242409.7	0.933979	3158592	0.679336	0.086633	157577634	18.87543
30	SBM Bank	2011	2950895	3827959.1	0.77088	2850644	0.679484	0.283431	136922665	18.73493
30		2012	14068185	10619423	1.32476	7885697	0.677553	0.272519	136523250	18.73201
30		2013	12122090	13453371	0.901045	7356889	0.498961	0.255437	138015485	18.74288
30		2014	1479020	10891867	0.135791	5143124	0.430852	0.27789	152852450	18.84498
30		2015	2944868	11688078	0.251955	6320337	0.493402	0.259832	167003995	18.93353
31	Sidian Bank	2011	2917832	9926112.8	0.293955	2952356	0.27139	0.188647	15441402	16.55256
31		2012	2459170	11426854	0.21521	2717168	0.216967	0.203753	20247139	16.82352
31		2013	2630619	12637677	0.208157	1770069	0.127799	0.216316	21161310	16.86769
31		2014	3836803	88371317	0.043417	21382716	0.220778	0.243389	16676153	16.62949
31		2015	5367835	100561319	0.053379	25585045	0.232145	0.237546	17174618	16.65894
32	Stanbic Bank Kenya Ltd	2011	7999210	113566158	0.070437	55508119	0.445976	0.168699	198990975	19.10877
32		2012	12743946	127545582	0.099917	60854007	0.435339	0.200298	224762410	19.23055
32		2013	14028656	132948141	0.10552	61575064	0.422597	0.173373	234164109	19.27153
32		2014	10747131	100159121	0.107301	54301450	0.49468	0.199677	187172358	19.04754
32		2015	9353462	106758603	0.087613	53234339	0.454981	0.183078	200385600	19.11575
33	Standard Chartered Bank	2011	10412291	109876189	0.094764	24985881	0.207489	0.343824	228579553	19.24739
33		2012	12761568	103226849	0.123626	20395787	0.180282	0.418513	228323218	19.24627

33		2013	11288060	111960597	0.100822	19412230	0.158203	0.263575	241711245	19.30325
33		2014	2550642	7239809.4	0.352308	427006.8	0.053816	0.292008	251575650	19.34325
33		2015	1146711	6467236.4	0.177311	714540.6	0.100812	0.193961	251041998	19.34113
34	Spire Bank Ltd	2011	2058257	4557768.2	0.451593	1216366	0.24351	0.189256	8918359.2	16.00362
34		2012	2289522	3867691.1	0.591961	916348.7	0.216179	0.181929	7378462.4	15.81408
34		2013	2166759	2881352.1	0.751994	778349.3	0.24648	0.164156	5488240.8	15.51812
34		2014	674735.4	5785070.2	0.116634	1487930	0.234681	0.155781	8362152.8	15.93923
34		2015	677254.3	5539663.2	0.122256	1478769	0.243568	0.216185	8297952.8	15.93152
35	Transnational Bank	2011	1467627	5745584.4	0.255436	1156931	0.183729	0.194225	8193094.4	15.9188
35		2012	1347760	5764204.1	0.233815	5007929	0.792725	0.198802	8188419.2	15.91823
35		2013	1609537	5327731.2	0.302106	1044689	0.178916	0.191738	15454514	16.55341
35		2014	45206.04	2377953.6	0.01901	565414.1	0.216954	0.23071	14224990	16.47051
35		2015	52211.84	2660634.9	0.019624	620388.2	0.212756	0.17389	12481025	16.33972
36	UBA Kenya Bank Ltd	2011	131082.5	2845151.4	0.046072	562125.3	0.180273	0.214868	5203785.6	15.4649
36		2012	404824.8	2999392	0.134969	592491	0.18024	0.206803	12265694	16.32232
36		2013	812233	3157765.9	0.257218	648132.8	0.187279	0.1644	12870655	16.37046
36		2014	397558.7	11418245	0.034818	2299421	0.183748	0.192682	16016058	16.5891
36		2015	358282	13304761	0.026929	2557465	0.175391	0.177929	17922785	16.70158
37	Victoria Commercial Bank	2011	13946.28	16416988	0.00085	3265281	0.181481	0.209133	20788128	16.84989
37		2012	640710.1	19650404	0.032605	4014859	0.186424	0.203585	25869564	17.06858
37		2013	1108079	20696573	0.053539	3911383	0.172439	0.420815	28857928	17.1779
37		2014	1833304	24766687	0.074023	4981895	0.18354	0.610758	33901223	17.33896
37		2015	2444476	25973304	0.094115	5773584	0.202825	0.480828	36558982	17.41444

