

**RELATIONSHIP BETWEEN LOAN CHARACTERISTICS AND CREDIT  
RISK AMONG COMMERCIAL BANKS IN KENYA**


**HAMDI AHMED SHEIK NUR**

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF  
THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE  
(FINANCE) FACULTY OF BUSINESS AND MANAGEMENT  
SCIENCES, UNIVERSITY OF NAIROBI**

**2022**


## DECLARATION

This research project is my original work and has not been presented for a degree in any other University.

Signature.....  
Hamdi Ahmed Sheik Nur  
D63/39310/2021

Date.....19 November 2022

The research project has been submitted for examination with my approval as university supervisor

Signature.....  
Prof Cyrus Iraya  
Department of Finance and Accounting  
Faculty of Business and Management Sciences  
University of Nairobi

Date.....06 November 2022

## **ACKNOWLEDGEMENT**

I greatly appreciate my supervisor, Prof Cyrus Iraya for guiding me and reviewing this research project to ensure it is conducted in the right way.

## **DEDICATION**

I dedicate this research project my friend Ayan for supporting me.

# TABLE OF CONTENTS

<b>DECLARATION.....</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>iii</b>
<b>DEDICATION.....</b>	<b>iv</b>
<b>LIST OF TABLES .....</b>	<b>vii</b>
<b>LIST OF FIGURES .....</b>	<b>viii</b>
<b>ABBREVIATIONS AND ACRONYMS.....</b>	<b>ix</b>
<b>ABSTRACT.....</b>	<b>x</b>
<b>CHAPTER ONE: INTRODUCTION .....</b>	<b>1</b>
1.1 Background to the Study.....	1
1.2 Research Problem .....	6
1.3 Research Objective .....	8
1.4 Value of the Study .....	8
<b>CHAPTER TWO: LITERATURE REVIEW .....</b>	<b>10</b>
2.1 Introduction.....	10
2.2 Theoretical Review .....	10
2.3 Determinants of Credit Risk among Commercial Banks.....	12
2.4 Empirical Review.....	15
2.5 Summary of Literature and Gaps .....	17
2.6 Conceptual Framework.....	18
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>19</b>
3.1 Introduction.....	19
3.2 Research Design.....	19
3.3 Population of the Study.....	19
3.4 Data Collection .....	19
3.5. Data Analysis.....	20
<b>CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION.....</b>	<b>23</b>
4.1 Introduction.....	23
4.2 Descriptive Statistics.....	23
4.3 Diagnostic Tests.....	25

4.4 Correlation Matrix .....	29
4.5 Regression Results .....	29
4.6 Discussion .....	32
<b>CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS .....</b>	<b>35</b>
5.1 Introduction .....	35
5.2 Summary .....	35
5.3 Conclusion .....	36
5.4 Recommendations of the Study .....	37
5.5 Limitations of the Study .....	37
5.6 Suggestions for Further Research .....	38
<b>REFERENCES.....</b>	<b>39</b>
<b>APPENDICES.....</b>	<b>42</b>
Appendix I: Data Collection Sheet .....	42
Appendix II: List of Commercial Banks in Nairobi .....	43
Appendix III: Raw Data Collected .....	45

## LIST OF TABLES

Table 3.1: Measurement of Variables .....	21
Table 4.1: Descriptive Statistics .....	23
Table 4.2: Multicollinearity Test .....	26
Table 4.3: Normality Test .....	26
Table 4.4: Test of Homogeneity of Variances .....	27
Table 4.5: Autocorrelation test .....	28
Table 4.6: Correlation Matrix .....	29
Table 4.7: Model Summary .....	30
Table 4.8: Analysis of Variance.....	30
Table 4.9: Beta Coefficients and Significance.....	31

## LIST OF FIGURES

Figure 2.1: Conceptual Framework .....	18
Figure 4.1: Linearity test.....	28



## **ABBREVIATIONS AND ACRONYMS**

CBK	Central Bank of Kenya
GDP	Gross Domestic Product
HELB	Higher Education Loans Bard
NPLs	Non-Performing Loans
SMEs	Small and Medium Entities
UK	United Kingdom

## ABSTRACT

In the banking industry in Kenya, some of the commercial banks like Consolidated Bank and Development Bank of Kenya are facing financial issues that have been attributed to interplay of a complex of factors credit risk being one of them. The characteristics of loans include the interest rate charged and maturity period are critical when it comes to repayment among customers. Credit risk has remained a key challenge among the commercial banks in Kenya. For instance, the value gross non-performing loans among commercial banks in Kenya for the period 2017, 2018, 2019 and 2020 stood at Kshs. 256,405 million, Kshs. 303,378 million, Kshs. 324,272 million and Kshs. 425,268 million respectively. This signifies an increasing trend in credit risk among these institutions which is not sustainable as failure to curb it may lead to a possible financial crisis and thus the motivation of this present study. The objective of this study was to establish the relationship between loan characteristics and credit risk among commercial banks in Nairobi, Kenya. Descriptive survey research design was adopted targeting 39 commercial banks with operations in Kenya and census was used. Information was obtained from auxiliary sources within the period 2017-2021 from central bank reports and the financial statements of the banks. The analysis was conducted through statistical package for social sciences guided by means and standard deviations, correlation and regression analysis and presented through tables. The study established that loan interest rate ( $\beta=0.233$ ,  $t>1.96$  &  $p<0.05$ ) and loan size ( $\beta=2.819$ ,  $t>1.96$  &  $p<0.05$ ), are significant loan characteristics that predict credit risk among commercial banks in Kenya when economic growth ( $\beta=-0.010$ ,  $t>1.96$  &  $p<0.05$ ) and stock market performance ( $\beta=0.158$ ,  $t>1.96$  &  $p<0.05$ ) are controlled. The study concludes that loan characteristics are significant predictors of credit risk among commercial banks when economic growth and stock market performance are controlled. The study recommends that the credit managers and loan managers working in commercial banks in Kenya should review their loan characteristics including the interest rate to allow customers repay their loans thus reducing exposure to credit risk. There is need for commercial banks to adopt modern lending practices involving in-depth quantitative appraisal of borrowers before a loan is advanced. The policy makers at the Central Bank of Kenya should have in place checks and balances to monitor compliance of commercial with credit risk guidelines. The policy makers at the Capital Market Authority should put in place relevant policies to enhance performance of stock markets.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background to the Study

Credit risk has remained a hotly debatable issue in the banking sector as it contributes to the overall stability of the entire industry. Given the nature of their operations of lending out funds to investors, it is highly probable that some of the customers may default on repaying of their interest and principal loaned amount thus resulting into credit risk to the bank (Jianchun, 2009). Non-performing loans (NPLs) is one of the measures and indicators of credit risks in a financial institution. Too much NPL in the loan portfolio of a bank can have inverse implication on overall profitability of a lending institution (Kwang'a, 2020). Loan characteristics are specific hallmarks of the credit facilities advanced to customers by lenders. Any change in loan characteristics can have an implication on credit risk in a financial institution. When a lending institution increases the interest rate on lending, borrowers are unlikely to service their outstanding loans and this would contribute towards an increase in credit risk in a financial institution (Lux & Tsolacos, 2021).

The study was anchored on the moral hazard theory and the adverse selection theory. Developed by Akerlof (1970), the moral hazard theory argues that in incidences, the borrower may fail to act in the accordance with the loan contract and redirect the borrowed funds in other activities away from those that were specified in the contract. Moral hazard results to loan diversion where funds are utilized to carry out other unrelated activities which may threaten the repayment ability thus increasing the credit risk of the lending institution (Akerlof, 1970). On the other hand, the adverse selection theory by Akerlof (1970) introduces the concept of information asymmetry that may exist between the borrowers and the lending institutions and how this shapes the repayment

behavior. In the process of lending, borrowers may have some advantageous information that lenders may not have and the differences in this information can increase the probability of loan default thus credit risk in a lending institution (Akerlof, 1970). The study will leverage these two theories to explain credit risk in financial institutions.

In the banking industry in Kenya, some of the commercial banks like Consolidated Bank and Development Bank of Kenya are facing financial issues that have been attributed to interplay of a complex of factors credit risk being one of them. The characteristics of loans include the interest rate charged and maturity period are critical when it comes to repayment among customers. Credit risk has remained a key challenge among the commercial banks in Kenya. For instance, the value gross non-performing loans among commercial banks in Kenya for the period 2017, 2018, 2019 and 2020 stood at Kshs. 256,405 million, Kshs. 303,378 million, Kshs. 324,272 million and Kshs. 425,268 million respectively (CBK, 2020). This signifies an increasing trend in credit risk among these institutions which is not sustainable as failure to curb it may lead to a possible financial crisis and thus the motivation of this present study.

### **1.1.1 Loan Characteristics**

Loan characteristics refers to the attributes of the credit facility advanced to borrowers like the size, tenure, type, collateralization and interest rate as well as default penalty (Brutscher, Heipertz & Hols, 2017). A loan with a very short repayment period would constrain the ability of the borrowers to generate adequate investment returns within such a limited timeframe. On the other hand, when the loan tenure is too lengthy, borrowers may have strong motivation of redirecting the extra money on consumption and other unproductive uses. Larger loan size is likely to increase the expected profits of borrowers on account that the net result is positively

correlated with loan amount and thus high s given to large loans by the borrowers. When the interest rate on loans increases, borrowers may not be able to service their loans (Lux & Tsolacos, 2021).

Loans can of various types depending on the purpose of which borrowers will utilize the proceeds; these include personal or business loans among others. Borrowers can also receive loans in form of cash or in-kind. According to Villar-Burke (2015), it can be hard for borrowers to repay large amount of loans within the provided time horizons. Muthoni, Mutuku and Riro (2017) argue that an increase in loan size would deteriorate the repayment performance. As opined by Muhammad, Bambale, Ibrahim and Sulaiman (2019), in the event that physical collaterals are requirement for lenders to advance loans to borrowers, majority of the clients of lending institutions may not be able to receive loans on account of lack of collaterals. In the present study, borrower's characteristics were measured by the loan interest rate and loan size. Brutscher et al (2017) observe that any significant variation in interest rate and loan size can increase the probability of default among borrowers and thus they are instrumental characteristics of loans.

### **1.1.2 Credit Risk**

Credit risk is the inability of the borrower to service the loan amount in accordance with the established contract (Kwang'a, 2020). The effect of credit risk is twofold; on borrowers and lenders. For lenders, credit risk will require an institution to set aside significant amount of money as loan loss provision (Jianchun, 2009). An increase in credit risk can also negatively effect on the financial intermediation role of the lending institution in the economy and it is an indicator of financial stability. For borrowers, credit risk would negatively affect their credit

worthiness and overall credit where getting future loans can be a challenge. High rates of loan repayment allow borrowers to obtain large amount of loans in future after an application (Mwangi & Muturi, 2016).

Literature provides two key measures of credit risk; NPLs and loan loss provisioning. An increase in NPLs in a lending institution would have an adverse effect on the profits of the institution. A persistent rise in NPLs without further interventions would drive the financial institution towards closure of operations. According to Thalassinos and Thalassinos (2018), credit risk constrains the liquidity position of the lending institution. Thus, the ability of the lending institution to effectively manage its exposure to credit risk would positively impact on its financial stability. In this study, NPLs ratio was used as a measure of credit risk and it is obtained as a quotient of NPLs against total loans. According to Jianchun (2009), NPLs-total loans ratio represents the overalls loans and advances that the financial institution end up failing to fully recover.

### **1.1.3 Loan Characteristics and Credit Risk**

There is a dearth of empirical and theoretical literature on loan characteristics and credit risks from different contexts. Theoretically, a negative relationship is anticipated between loan characteristics like interest rate and loan size and credit risk. The moral hazard theory predicts that when borrowers obtain huge amount of loans and diverts the same to other activities not specified in the contractual agreement, credit risk of the lending institution is likely to increase (Akerlof, 1970). From the adverse selection point of view, lenders may have unique information concerning some hidden loan characteristics that borrowers are not aware of and may ultimately affect the credit risk (Akerlof, 1970).

Empirically, Jianchun (2009) observed that credit risk has a negative link with long term loans but positively linked with collateralized loan facilities. Lux and Tsolacos (2021) shared that loan characteristics significantly predict the credit risk of the lending institutions. Jagongo (2019) noted that the sizes and tenure of loans significantly predict the loan performance as a proxy of credit risk. Muhammad, Bambale, Ibrahim and Sulaiman (2019) observed that the size and tenure of the loan are positively linked with loan repayment. Muthoni, Mutuku and Riro (2017) help that loan characteristic significantly predicts credit risk. Kwang'a (2020) failed to obtain sufficient evidence to link loan interest rate and credit risk.

#### **1.1.4 Commercial Banks in Nairobi, Kenya**

Commercial banks are financial intermediaries that are established to mobilize deposits from customers and advance loans. Through these two roles, commercial banks are able to positively impact on capital creation, rate of savings and investment in an economy. In Kenya, commercial banks are regulated by the Central Bank of Kenya (CBK). The CBK regulate commercial banks to enhance their stability and protect the interests of the depositors. These institutions are classified into public and private institutions. The private commercial banks are further classified into the locally owned and the foreign owned institutions. In total, there were 39 commercial banks in Kenya after some like Imperial Bank, Charterhouse and Chase bank had been placed under receivership and in liquidation respectively.

The main objective of any commercial banks to ensure it operates profitably so as to remain stable and grow. In the past decade, a number of challenges have been evident in the banking sector in Kenya including a sharp increase in NPLs and loan loss provisioning as indicators of their credit risk. For instance, in 2019 and 2020, the value of NPLs stood at Kshs. 324272

million and Kshs. 425,268 million respectively (CBK, 2020). In terms of loan loss provisioning, the figures for 2018, 2019 and 2020 were Kshs. 113,501 million, Kshs. 131,640 million and Kshs. 194,503 million respectively (CBK, 2020). Thus, this high level of NPLs has remained to be an issue of major supervisor concern in Kenyan banking sector and thus the motivation of this present study.

## **1.2 Research Problem**

Credit risk arises when borrowers are not able to meet their financial obligations of loan repayment as specified in the contractual agreement. Credit risk increases the level of NPLs and the amount set aside as loan loss provisioning in the balance sheet of the lending institution (Lux, & Tsolacos, 2021). Loan characteristics cover the attributes of the credit facility like size, tenure and interest rates and their effect on credit risk has provided mixed results from both theoretical and empirical point of view. Any change in the loan characteristics would have an effect on credit risk of the lending institution (Muthoni, Mutuku & Riro, 2017

Commercial banks in Kenya have consistently experienced a sharp increase in NPLs and loan loss provisioning over the past years. For example, NPLs among these institutions increased from 324272 million 2019 to Kshs. 425,268 in 2020 respectively (CBK, 2020). This trend is expected to be higher in 2021 and 2022 and in future especially as COVID-19 pandemic and the hard economic times continue threatening the livelihood of borrowers. The adverse and imminent danger of this trend in NPLs is dire not only to the deposits of the customers but also to the overall growth of Kenya as a country and thus it require urgent regulatory interventions and concerns. Failure to effectively manage this growing credit risk among the Kenyan



commercial banks would result in some of the financial institutions closing down operations on account of constrained liquidity positions thus placing the deposits of customers at risk.

The existing studies include Jiménez and Saurina (2002) who focused on Spain to link loan characteristics and credit and obtained significant nexus. Jianchun (2009) used a case of China to explore the link between loan characteristics and credit risks are negatively connected. Ghulam, Dhruva, Naseem and Hill (2018) appraised how loan and borrower's attributes predicted subprime automobile loans in the United Kingdom and established existence of significant interplay. Rosen (2011) studied the link between the lender type and loan characteristics and noted that on average, the mortgages from banks are safer as compared to the mortgage banks. Lux and Tsolacos (2021) sought to determine how loan characteristics predicted default among commercial mortgage portfolios in UK and noted the attributes of lenders significantly determine the default probability of commercial mortgages.

Locally in Kenya, Jagongo (2019) used a case of Higher Education Loans Board to appraise how loan characteristics influence loan performance. It was noted that the size and tenure of the loan significantly predict loan performance. Muthoni, Mutuku and Riro (2017) did a study focusing on microfinance institutions to link loan characteristics and default of microcredit. The study obtained evidence the loan characteristics were significant predictors of default of microcredit. Kwang'a (2020) used a case of HELB to provide the link existing between loan characteristics and repayment performance and shared that interest rate was insignificant predictor variable. Felix and Wachira (2018) did an assessment of loan characteristics and their implication on loan defaulting with a focus on small and medium entities (SMEs) in Kitui and established existence of strong and positive interaction.

However, the reviewed studies present gaps as some like Jiménez and Saurina (2002) and Jianchun (2009) were Spain and China and not in Kenya presenting contextual gap. Other studies create conceptual gap by focusing on loan performance (Jagongo, 2019) which is conceptually different from credit risk. There are other studies that create methodological gap by adopting case studies (Jagongo, 2019, & Jagongo, 2019) that can limit the adoption of quantitative approaches. Other studies give contradictory and mixed findings of negative (Jianchun, 2009) and positive (Felix & Wachira, 2018) which call for a study to clear the inconsistencies. Therefore, against this background, the present study sought to provides answers to the following research question: what is the relationship between loan characteristics and credit risk among commercial banks in Nairobi, Kenya?

### **1.3 Research Objective**

To determine the relationship between loan characteristics and credit risk among commercial banks in Nairobi, Kenya

### **1.4 Value of the Study**

The management of commercial banks in Kenya would be in position to implement sound policies aimed at managing the ever increasing trend in NPLs. The credit and loan officers and managers working in commercial banks in Kenya would be able to modify the existing loan terms and conditions to suit customers and thus managing the level of credit risk. All these efforts would contribute to the overall soundness and stability of the banking sector in Kenya.

Regulators including the CBK would be in position to formulate and implement relevant guidelines and rules to manage credit risk among commercial banks and thus helping to protect

the interests of the depositors. Policy makers working among commercial banks in Kenya would be in position to develop relevant policies as far as loan characteristics and credit risk in their institutions is concerned. The efforts of the policy makers and those of the CBK as a regulator would contribute towards strengthening the commercial banks.

The study would contribute towards growing and increasing the existing literature on the nexus between loan characteristics and credit risk. The study would support or extend the existing theories on credit risk. It would provide the basis upon further studies can be conducted by reviewing literature of this study.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter is set out to detail the review of theories anchoring the inquiry as well as the past empirical studies. The knowledge gaps and conceptual framework are also presented.

### **2.2 Theoretical Review**

The study was guided by the moral hazard theory and the adverse selection theory as discussed in the subsequent sections.

#### **2.2.1 Moral Hazard Theory**

The proponent of this theory was Akerlof (1970) where moral hazard is viewed as an inherent issue arising in the event when borrowers are skeptical in studying the motives of lenders. Loan contractual agreements need to be guided by the principle of good faith and it's in absence create moral hazard. Therefore, moral hazard take effect once lending has already taken place. The hindsight behavior of lenders gives an advantage to borrowers on the basis of the purpose of the loan proceeds (Boot & Thakor, 1994). It is highly likely that a borrower may not act in good faith and redirect the loan proceeds in other projects away from the one specified in loan contract. Moral hazard result into behavior that actions that are against the contractual terms and expose lenders to some risks associated with repayment ability (Laffont & Rey, 2003).

Moral hazard would create a situation where the borrower has less ability of repaying especially when inputs are lower than the expected ones. Financial institutions do grant loans to borrowers for the purpose of running businesses in terms of working capital (Mehrteab, 2005). However, at some point, some of the borrowers may divert the loans to other unproductive activities thus

creating moral hazards that may adversely impact on loan repayment ability (Simtowe, Zeller & Phiri, 2006). In relation to this study, loans advanced to borrowers may be diverted to other projects and purpose other than those specified in loan contract. Issues may arise where borrowers cannot be trusted to meet their loan obligation. Any failure to follow the loan contract provisions means that borrowers will face challenges in repaying the advanced credit facility thus increasing credit risk (Haldane & Scheibe, 2004).

This theory has received criticisms for assuming that lenders are characterized by hindsight behavior which is not necessarily the case. The assumption of the theory that lenders can advance a loan to a borrower after which moral hazard arises is not realistic especially with the rise of technology that has made appraisal of borrowers more easily and accurately (Blazy & Weill, 2013). However, despite these criticisms, the theory was used to explain how concealment of some crucial information like hidden charges on loans can lead to moral hazard after borrowers have successfully received their loans. Based on this theory, an inverse relationship is anticipated between loan characteristics and credit risk.

### **2.2.2 Adverse Selection Theory**

This theory was advanced by Akerlof (1970) after studying quality ambiguity. The theory leverages information asymmetry that exists between borrowers and lender to explore credit risk. Nayyar (1990) shared that information asymmetry arises from existence of imbalances in knowledge levels between two parties in a contract. The contracting parties leverage the differences in information to benefit from the transaction. In the context of lending institutions, borrowers are only in position to determine the loan characteristics after they have come into direct contact with lenders. The lenders of loans have an advantage since they have access and

own the loans and have clear understanding of their characteristics that are visible and the hidden ones that cannot be disclosed (Akerlof, 1970).

Under this type of environment, borrowers have no ability of telling the most suitable characteristics of the loan. This implies that the quality of loans in the market is undermined because of the existing differences in knowledge possessed by borrowers and lenders (Mehrteab, 2005). As a problem, adverse selection arises because inability to carry out extensive auditing of the motives and desires of lenders (Akerlof, 1970). In the lending and financial intermediation process, lenders may not have a clear understanding of the motives of the borrowers. In order to deal with this problem of adverse selection, lenders employ such mechanisms as increasing the interest rate payable by highly risky borrowers. This theory has been critiqued for advocating the use of high interest rate to mitigate the problem of adverse selection (Akerlof, 1970). This is because such a step may deny borrowers in good credit rating position an opportunity of accessing the loan facilities.

This theory was used to explain how knowledge of specific loan attributes by lenders that borrowers may not be fully knowledgeable about prior to the transaction can lead to quality of the resulting loan portfolio determined by credit risk. On the basis of this adverse selection theory, a negative nexus is predicted between loan characteristics and credit risk.

### **2.3 Determinants of Credit Risk among Commercial Banks**

The subsequent sections review literature on determinants of credit risk among commercial banks.

### **2.3.1 Loan Characteristics**

Loan characteristics are instrumental in predicting the credit risk in a lending institution. Interest rate for instance is the foundation of financial intermediation efforts in an economy. Any efforts to increase the price of loans would make it hard for borrowers to be able to repay their loans and thus a possibility of increasing the credit risk. An increase in loan amount and period of payment can also positively contribute to inability to repay the loan and thus an increase in credit risk (Jiménez & Saurina, 2002).

It is anticipated that an increase in average lending interest rate is likely to have a negative effect on credit risk. The adverse selection theory advocates for use of high interest rate on lending to highly risky borrowers but this may deny an opportunity of accessing loans to credit worthy borrowers (Kwang'a, 2020). The present study will measure loan characteristics through loan interest rate and loan size.

### **2.3.2 Economic Growth**

An improvement in economic growth would increase the income including salaries at household level and this is likely to improve the quality of loans of the lenders. On the contrary, a decline in economic growth would mean a reduction in cash flows at household level and this may force borrowers to prioritize consumptions as opposed to loan repayment this increasing the credit risk (Skarica, 2013). In times of economic boom, there are usually high levels of income in the economy and the level of portfolio risk would be minimal. During recession periods, income of borrowers would be constrained creating a tradeoff between consumption expenditure and loan repayment and ultimately impacting on credit risk (Alexandri & Santoso, 2015).

Economic growth is a macro-economic external variable that has a bearing on credit risk of the lending institution. Louzin, Valdia and Metaxas (2010) observed that gross domestic product (GDP) growth is negatively linked with NPLs. Skarica (2013) observed that GDP growth rate and NPLs are negatively linked with each other. Makri et al. (2014) also provided evidence that GDP growth and NPLs are inversely connected with each other. On the contrary, Alexandri and Santoso (2015) obtained existence of positive link between GDP and NPLs. Beck et al. (2015) observed that GDP and NPLs are negatively connected. Skarica (2013) shared that GDP and NPLs are negatively connected. Makri et al. (2014) established existence of negative nexus between GDP and NPLs. The study will measure economic growth using GDP growth rate.

### **2.3.3 Stock Market Performance**

Improvements in stock market performance provide an indication that firms represented by stocks are doing well to attract investors. It also signifies existence of a willing and able stock market. It provides an indication that the stock market is liquid enough to support investment. It is on the basis of this liquidity that provides the relationship with repayment of loans by the borrowers (Wong, Wong & Leung, 2010).

Stock market index is a good indicator of stock market performance. Any rise or fall in this index is a reflection of the available level and amount of disposable income of the investors who are also borrowers. There exists an inverse nexus between stock market index and the quality of loan portfolio of the lenders. A rise in stock returns provide an indication of enhanced ability to service loans by borrowers and this would reduce the level of credit risk of the financial institution (Wong, Wong & Leung, 2010). The study will measure stock market performance using the returns on NSE-20 share index.



## **2.4 Empirical Review**

The study conducted by Jiménez and Saurina (2002) focused on Spain to link loan characteristics and credit risk. The period of the study was 1988 all through to 2000 and information was obtained on loans recorded by credit institutions in the country. The study observed existence of an inverse link between loan attributes and credit risk. Jianchun (2009) used a case of China to explore the link between loan characteristics and credit risk. The variables covered in the study include collateralized loans, long term and short-term loans. Logit models guided the execution of regression analysis between the study variables. Information was sought from Shanghai stock exchange within the period 2002-2007. It emerged that while collateralized loans have positive nexus with credit risk, long term loans recorded an inverse link. Ghulam, Dhruva, Naseem and Hill (2018) conducted a study with focus on loan and borrower attributes and the risks of subprime automobile loans. The study was conducted in UK and a case study approach was embraced. It emerged that unmarried borrowers have higher probability of defaulting on their loan status thus increasing the level of credit risk.

Rosen (2011) explored how lender type influences the loan characteristics. It was noted that on average, relatively safe mortgages are issued by commercial banks as compared to mortgage banks. Lux and Tsolacos (2021) conducted an assessment of loan characteristics and their role in predicting default of commercial mortgage with the main focus on lenders from UK. Both probit model and linear discriminant analysis were the analytical tools used in methodology. It emerged that the attributes of lender have significant prediction on default of mortgages. The study conducted by Muhammad, Bambale, Ibrahim and Sulaiman (2019) in Nigeria focused on loan attributes, loan repayment and their implication on performance of SMEs. Both size and tenure were the proxies of loan characteristics and information was gathered through questionnaire that

had undergone structuring. It emerged that the size and tenure of the loan have direct and significant interaction with repayment performance.

Jagongo (2019) focused on loan characteristics and their implication on loan performance using a case of HELB in Kenya. The adverse selection and moral hazard theory provided anchorage to the study variables. The design embraced was descriptive and the horizon covered 2009 to 2018. Information of the study was obtained from first hand sources. It was noted that the tenure and size of the loan significantly predict loan performance. Muthoni, Mutuku and Riro (2017) did an analysis of loan characteristics and default of microcredit using a comparative approach of MFIs and financial intermediaries in Kenya. In total, 48 MFIs and 76 financial institutions were covered and sampling was done through multi-stage approach. Information was gathered from first hand sources. It was observed that loan characteristics are significant predictors of default rates.

Kwang'a (2020) used a case of HELB exploring how loan characteristics and repayment performance are connected with each other. The variables covered the size, tenure and interest rates of loans. The horizon considered by this study was 2009-2018 and information was obtained in its primary form. The study observed that interest rate does not significantly predict loan repayment performance. Felix and Wachira (2018) covered the SMEs in Kitui to link loan attributes and their loan default. The variables covered the structure of interest rate and modes of loan repayment. Sampling was done through simple random technique where 20% of the 407 SMEs were covered. Information was sought in its primary form. It was shown that loan characteristics significantly predict loan default.

The study by Mwangi and Muturi (2016) focused on credit risk management and loan repayment using Kenyan commercial banks. The variables covered credit policies, debt collection processes, risk identification and credit scoring. A total of 55 participants were purposely identified and included in the inquiry. Information was sought from primary sources. The analysis demonstrated that credit risk management positively and significantly enhances loan repayment. Nyasaka (2017) carried out a study with focus on credit risk management practices and NPLs using KCB bank in Kenya. The adopted design was descriptive and participants were the credit managers. Information was sought from first hand sources. It was shown that the attributes of the borrowers are considered by lenders when generating scores for corporate and business loans.

## **2.5 Summary of Literature and Gaps**

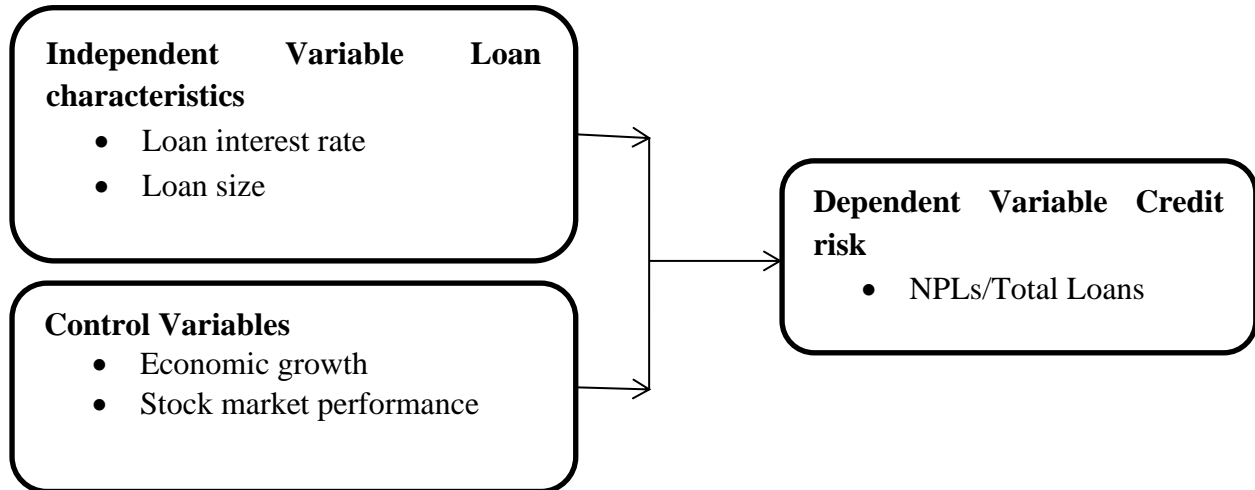
The chapter has reviewed studies that present gaps. The study conducted by Jiménez and Saurina (2002) focused on Spain and not Kenya. Jianchun (2009) used a case of China and not Kenya. Ghulam, Dhruva, Naseem and Hill (2018) did a study in UK and not in Kenya. Rosen (2011) used loan characteristics as dependent variable while the same will be used as independent variable in the present study. Lux and Tsolacos (2021) used default rate as the dependent variable which is conceptual different from credit risk.

Muhammad, Bambale, Ibrahim and Sulaiman (2019) did a study in Nigeria and not in Kenya and it focused on SMEs performance as the dependent variable while the focus of the present study will be credit risk. Jagongo (2019) and Kwang'a (2020) used a case of KCB and HELB which call for use of qualitative as opposed to quantitative methods that the present study will adopt.

Muthoni, Mutuku and Riro (2017) focused on MFIs while commercial banks will be covered in the present study.

## 2.6 Conceptual Framework

Figure 2.1 is the proposed conceptual framework of the study.



**Figure 2.1: Conceptual Framework**

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter details the methodologies that were adopted in answering the research questions. It covers the research design, population, data collection and analysis.

### **3.2 Research Design**

Descriptive survey research design was adopted so as to establish explain nexus between loan characteristics and credit risk. The design supported the use of descriptive and inferential analysis to come up with relevant inferences. Some past related studies that adopted this causal design include Ghulam, Dhruva, Naseem & Hill (2018).

### **3.3 Population of the Study**

Since all commercial banks have their head offices in Nairobi, this study targeted all the 39 commercial banks with operations in Kenya (appendix ii). Census was adopted as the population is relatively small and easily accessible.

### **3.4 Data Collection**

Secondary data was adopted covering a period of 2017-2021. The period was selected because it has experienced an increase in trend in NPLs as an indicator of credit risk and it was pertinent to determine the cause of the same. Annual data was gathered on average lending rate, total loans, GDP growth rates, NSE-20 share index and NPLs from respective commercial banks, CBK and Nairobi Security Exchange as well as the Kenya National Bureau of Statistics.

### 3.5. Data Analysis

The analysis of the findings was supported by means and standard deviations as well as correlation and regression analysis. The analytical tool was SPOSS version 24. Tables helped in presenting the evidence analyzed.

#### 3.5.1 Model Specification

The study adopted the following panel data model:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3t} + \beta_4 X_{4t} + \epsilon_{it}$$

Where Y is the credit risk (NPLs/total loans) of bank i at time t

$\alpha$  refers to the Y intercept of the linear model

$X_{1it}$  refers to loan interest rate of bank i at time t

$X_{2it}$  refers to loan size (Total loans/GDP) ratio of bank i at time t

$X_{3it}$  refers to economic growth at time t

$X_{4it}$  refers to stock market performance at time t

$\beta_1$ ,  $\beta_2$ ,  $\beta_3$ , and  $\beta_4$  are the coefficient of  $X_{1it}$ ,  $X_{2it}$ ,  $X_{3it}$ , and  $X_{4it}$ , respectively while  $\epsilon$  is error term

Table 3.1 provides the measurement of variables

**Table 3.1: Measurement of Variables**

Type of variable	Scale of measurement	Operationalization	Source of data
Independent loan interest rate	Continuous	Average interest rate on lending (%)	CBK, commercial banks
Independent Loan size	Ratio	Total loans/GDP	CBK, commercial banks, KNBS
Control Economic growth	Continuous	GDP growth rate (%)	KNBS
Control stock market performance	Continuous	Natural logarithm of returns on NSE-20 Share index	NSE
Dependent credit risk	Ratio	NPLs/Total loans	CBK, commercial banks

### 3.5.2 Diagnostic Tests

Diagnostic tests were performed prior to regression analysis and they were meant to validate the assumptions of regression analysis. The specific test that were performed include multicollinearity using Variance of Inflation Factors, normality using Shapiro-Wilk test, heteroscedasticity test using Levin test, linearity test and autocorrelation test

Multicollinearity is a situation when at least or all the independent variables are highly related with each other. This should not be the case and the presence of this assumption will require some statistical treatment of the data like dropping of the highly correlated predictor variables (Daoud, 2017). The study utilized the values of Variance of Inflation Factor (VIF) to test for presence of multicollinearity and values within range of 1-10 provided an indication of absence of this condition (Haitovsky, 1969).

Normality is a situation when the data of the study has a normal distribution. This is also a desirable assumption that data should seek to observe before running regression analysis. Shapiro-Wilk test was used to test for normality and  $p > 0.05$  was an implication that normality is present in the data (Yazici & Yolacan, 2007).

Heteroscedasticity is absence of constant variance of the error term and its opposite but desirable assumption is homoscedasticity (Pagan & Hall, 1983). Presence of heteroscedasticity is a strong violation of the regression analysis assumptions. Levin test was determined and the resultant p-values ( $p > 0.05$ ) led to acceptance of the homoscedasticity condition in the data (Glejser, 1969).

Linearity is used in relationship to the dependent (Y) and the independent variables (Xs) of the study. Linearity requires these variables to have a linear relationship and it was tested through the normal PP plot through observation of the resultant normal PP line (Hansen, 1999).

Autocorrelation is used mostly in reference to the time series data in regard to the error term and the time period. It was determined through Durbin Watson Statistic (d) with values closer or equal to 2 providing an indication of presence of serial correlation in the data (White, 1992).

The presence of any of the above diagnostic tests required statistical treatment of the data by dropping of the variables or log transformation of the data. It will also require inspection of the variables and confirmation using other alternative specific tests of the regression assumptions (Zeileis & Hothorn, 2002). Like for instance, when Levine test fail valid results on heteroscedasticity, the data will further be inspected using Scatter plots and other relevant tests of heteroscedasticity.

### **3.5.3 Significance Tests**

The p-values from the regression analysis were interpreted taking into account a significance level of 0.05. P-values of less than 0.05 will mean existence of significant nexus. This corresponded with t-values of above 1.96.



## CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

### 4.1 Introduction

The analysis of the findings is detailed in this chapter to meet the objective that guided the study. The specific contents covered in this study include descriptive statistics that covered means and standard deviations and the results on diagnostic tests. The findings on correlation and regression analysis are also detailed as part of the inferential statistics.

### 4.2 Descriptive Statistics

Descriptive statistics covering means and standard deviations were used to provide a description of the study variables with a breakdown as shown in Table 4.1.

**Table 4.1: Descriptive Statistics**

	<b>n</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>
Loan Interest Rate (%)	195	12.00	13.67	12.649	.634
Loan size (as % of GDP)	195	.00	.06	.008	.011
Economic growth (%)	195	-.30	7.50	4.320	2.607
Stock market performance (Kshs)	195	3.06	3.26	3.147	.070
Credit risk (%)	195	.00	.76	.195	.156

Source: Research Data (2022)

The findings in Table 4.1 indicate that the mean value of loan interest rate stood at 12.649% with the minimum of 12.00% and maximum of 13.67% having standard deviation of 0.634. One observation that can be drawn from this finding is that there was significant disparity between the highest and lowest interest rate that commercial banks in Kenya charged on their loans as demonstrated by a standard deviation of less than 1. The other implication of this finding is that on average, commercial banks in Kenya charged an interest rate of 12.649% on their loans to customers across the period 2017-2021.

On loan size, the value of mean was 0.008 with maximum value being 0.06, minimum being 0.00 and standard deviation was 0.011. This means that on average, the loans that commercial

banks advanced to customers across the period 2017-2021 only contributed towards 0.8% of the national GDP of Kenya. In other words, loan size as an aspect of loan characteristic has negligible contribution towards the growth of the economy. This could be partly because some of the loans that customer's borrower is used for individual consumption at the expense of investment. It could also be attributed to lack of prudence in utilization of the loans advanced to some of the customers of the commercial banks.

The results on economic growth indicated a mean of 4.320%, a maximum of 7.50%, minimum of -0.30% and standard deviation of 2.607. One clear observation from this finding is that the variable had the largest standard deviation among all other variables. This implies that within the period 2017-2021, the economic growth rate of Kenya was not stable but unsteady characterized by increased volatility. This assertion can be supported by a number of developments and events that occurred within the same period, one being the upsurge of the global COVID-19 pandemic in late 2019. There were also the General elections in 2017 and the hand-shake within the same period. All these developments could be the possible reasons that contributed towards fluctuation in the economic growth rate of Kenya over the period of consideration.

The results on stock market performance represented by returns on NSE-20 share index indicated the value of mean as Kshs. 3.147 billion, with the minimum, maximum and standard deviation values being Kshs. 3.06, Kshs. 3.26 billion and 0.070 respectively. The value of standard deviation was less than 1, implying that stock markets in Kenya recorded steady performance in the period under consideration despite the aforementioned developments like the COVID-19 pandemic.

The findings on credit risk determined as NPLs against total loans indicate the value of mean as 0.195 with standard deviation of 0.156, minimum and maximum values being 0.00 and 0.76 respectively. The implication of this finding is that for every dollar loans that commercial banks advanced to customers, 0.195 translated into NPLs. In other words, 19.5% of the loans that customers borrowed from commercial banks in the period 2017-2021 ended up as NPLs. This trend could also be partly explained by the COVID-19 pandemic where most people who had borrowed lost their jobs and businesses faced operational challenges that constrained their liquidity and ability to pay their loans. This forced most of the commercial banks in Kenya to restructure loans that customers had borrowed.

### **4.3 Diagnostic Tests**

Diagnostic tests were performed prior to regression analysis and they were meant to validate the assumptions of regression analysis. The specific test that were performed include multicollinearity using Variance of Inflation Factors, normality using Shapiro-Wilk test, Heteroskedasticity test using Levin test, linearity test and autocorrelation test

#### **4.3.1 Multicollinearity Test**

Multicollinearity is a situation when at least or all the independent variables are highly related with each other. This should not be the case and the presence of this assumption will require some statistical treatment of the data like dropping of the highly correlated predictor variables (Daoud, 2017). The study utilized the values of Variance of Inflation Factor (VIF) to test for presence of multicollinearity as shown in Table 4.2.

**Table 4.2: Multicollinearity Test**

	Collinearity Statistics	
	Tolerance	VIF
Loan Interest Rate	.752	1.329
Loan size	.998	1.002
Economic growth	.823	1.215
Stock market performance	.636	1.572
<b>Average</b>	<b>.802</b>	<b>1.280</b>

Source: Research Data (2022)

Table 4.2 indicates the average VIF value as 1.280 for the four variables that were included in the study. This finding provides an indication of absence of multicollinearity assumption in the data and thus all the variables are to be retained without treatment for further analysis. This is consistent with Haitovsky (1969) who observed that VIF values within range of 1-10 provided an indication of absence of this condition.

#### 4.3.2 Normality Test

Normality is a situation when the data of the study has a normal distribution. This is also a desirable assumption that data should seek to observe before running regression analysis. Shapiro-Wilk test was used to test for normality and the findings were determined and summarized as shown in Table 4.3.

**Table 4.3: Normality Test**

	Shapiro-Wilk		
	Statistic	df	Sig.
Credit Risk	.945	4	.683
Loan Interest Rate	.676	8	.661
Loan size	.284	15	.345
Economic growth	.577	18	.678
Stock market performance	.771	5	.846

Source: Research Data (2022)

Table 4.3 shows the findings of Shapiro wilk test. From the results, all the p-values under the significance column are above 0.05 ( $p > 0.05$ ). This is a possible indication that the data used in

the study had a normal distribution and thus observed the assumption of regression analysis. This finding is consistent with Yazici and Yolacan (2007) who shared that when testing for normality using Shapiro Wilk,  $p > 0.05$  is an implication that normality is present in the data.

### 4.3.3 Heteroskedasticity test

Heteroskedasticity is absence of constant variance of the error term and its opposite but desirable assumption is homoskedasticity (Pagan & Hall, 1983). Presence of heteroskedasticity is a strong violation of the regression analysis assumptions. Levin test was determined and the findings are as summarized in Table 4.4.

**Table 4.4: Test of Homogeneity of Variances**

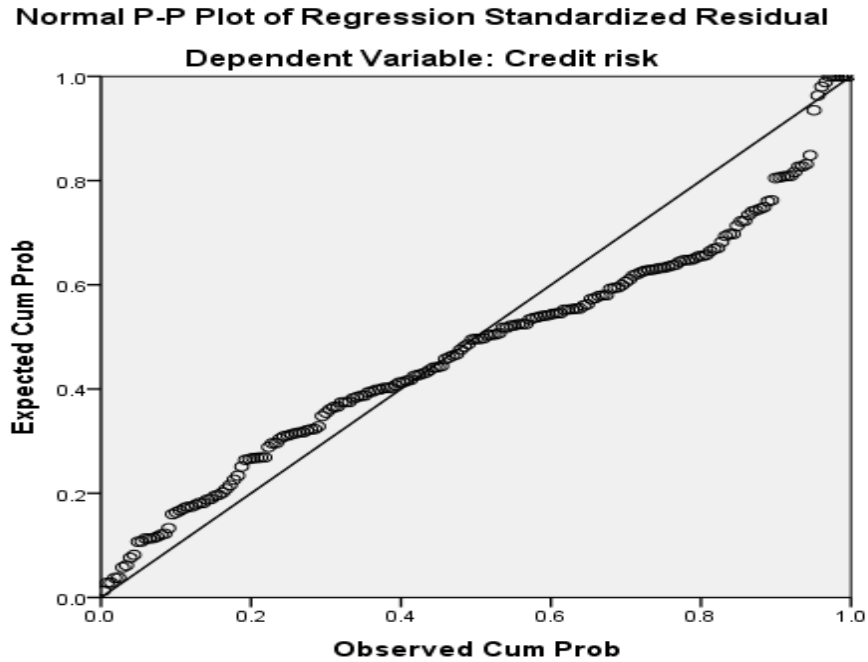
	<b>Levene Statistic</b>	<b>Sig.</b>
Loan Interest Rate	.820	.487
Loan size	674.540	.765
Economic growth	17.400	.346
Stock market performance	18824.629	.175

Source: Research Data (2022)

The findings in Table 4.4 indicate that p-values under Levene test are all above 0.05, which means there was absence of heteroskedasticity and therefore homoskedasticity was assumed. This finding concurs with Glejser (1969) who shared that the resultant p-values under Levene test of ( $p > 0.05$ ) leads to acceptance of the homoskedasticity condition in the data.

### 4.3.4 Linearity test

Linearity is used in relationship to the dependent (Y) and the independent variables (Xs) of the study. Linearity requires these variables to have a linear relationship and it was tested through the normal PP plot through observation of the resultant normal PP line (Hansen, 1999).



**Figure 4.1: Linearity test**

Source: Research Data (2022)

By observing the Normal PP line in Figure 4.1, it can be deduced that there is linear relationship between the study variables.

#### **4.3.5 Autocorrelation test**

Autocorrelation is used mostly in reference to the time series data in regard to the error term and the time period. It was determined through Durbin Watson Statistic (d). The findings were determined and presented as shown in Table 4.5.

**Table 4.5: Autocorrelation test**

<b>Model</b>	<b>Durbin-Watson</b>
1	1.907

Source: Research Data (2022)

From Table 4.5, the value of Durbin Watson statistic is given as 1.907. When this value is rounded to the whole, it becomes exactly 2, providing a pointer that there was no serial

correlation in the data. This concur with White (1992) who observed that Durbin Watson statistic values closer or equal to 2 providing an indication of presence of serial correlation in the data.

#### 4.4 Correlation Matrix

Correlation analysis was conducted to predict the relationship between the study variables as demonstrated by the values of Pearson Correlation as shown in Table 4.6.

**Table 4.6: Correlation Matrix**

		<b>Credit risk</b>	<b>Loan Interest Rate</b>	<b>Loan size</b>	<b>Economic growth</b>	<b>Stock market performance</b>
Credit risk	Pearson Correlation	1				
Loan Interest rate	Pearson Correlation	.578	1			
Loan size	Pearson Correlation	.178	-.044	1		
Economic growth	Pearson Correlation	-.076	.129	-.022	1	
Stock market performance	Pearson Correlation	.318	-.490	.026	-.412	1

Source: Research Data (2022)

Table 4.6 shows that loan interest rate ( $r=0.578$ ) had a strong and positive correlation with credit risk among commercial banks. On the other hand, loan size ( $r=0.178$ ) as a loan characteristic had weak but positive relationship with credit risk. Economic growth ( $r=-0.076$ ) reported a weak and negative relationship with credit risk. Stock market performance ( $r=0.318$ ) on the other hand had a moderate and positive relationship with credit risk. It then follows that loan characteristics have positive effect on credit risk when economic growth and stock market performance are controlled for.

#### 4.5 Regression Results

The effect of loan characteristics on credit risk was analyzed through regression analysis and the subsequent sections detail the findings.

#### 4.5.1 Model Summary

Table 4.7 is a breakdown of the regression model summary of the study.

**Table 4.7: Model Summary**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.925	.856	.853	.06006

Source: Research Data (2022)

Table 4.7 shows that on overall, 85.3% change in credit risk among commercial banks in Kenya can be explained by loan characteristics when economic growth and stock market performance are controlled (Adj.  $R^2=0.853$ ). This therefore implies that are still other factors not explored in the present study that also have an effect on credit risk of the commercial banks.

#### 4.5.2 Analysis of Variance

The findings on ANOVA were determined and test the overall significance of the model and shown in Table 4.8.

**Table 4.8: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	4.066	4	1.017	281.845	.000 <sup>b</sup>
Residual	.685	190	.004		
Total	4.751	194			

Source: Research Data (2022)

Table 4.8 indicate the regression model that was to predict loan characteristics on credit risk was overally significant ( $F=281.845$ ,  $p<0.05$ ).

#### 4.5.3 Beta Coefficients and Significance

The findings on the beta coefficients and significance were established and summarized as shown in Table 4.9.



**Table 4.9: Beta Coefficients and Significance**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.224	.305		10.564	.000
Loan Interest Rate	.233	.008	.943	29.691	.000
Loan size	2.819	.362	.215	7.779	.000
Economic growth	-.010	.002	-.164	-5.000	.000
Stock market performance	.158	.077	.071	2.057	.041

Source: Research Data (2022)

From Table 4.9, the model fitting becomes:

$$Y_{it} = 3.224 + .233X_{1it} + 2.819X_{2it} - .010X_{3t} + .158X_{4t}$$

Where Y is the credit risk (NPLs/total loans) of bank i at time t

$X_{1it}$  refers to loan interest rate of bank i at time t

$X_{2it}$  refers to loan size (Total loans/GDP) ratio of bank i at time t

$X_{3it}$  refers to economic growth at time t

$X_{4it}$  refers to stock market performance at time t

From the results in Table 4.9, it can be inferred that a unit increase in loan interest rate would translate to an increase in credit risk among commercial banks by 0.233 dollars and that a unit increase in loan size would increase credit risk by 2.819 dollars. Furthermore, a unit decrease in economic growth rate would lead to an increase in credit risk by 0.010 dollars. A unit increase in stock market performance would increase credit risk among commercial banks in Kenya by 0.158 dollars. Taking into consideration the significance at 5%, the study observed that loan interest rate ( $\beta=0.233$ ,  $t>1.96$  &  $p<0.05$ ) and loan size ( $\beta=2.819$ ,  $t>1.96$  &  $p<0.05$ ), are significant loan characteristics that predict credit risk among commercial banks in Kenya when

economic growth ( $\beta=-0.010$ ,  $t>1.96$  &  $p<0.05$ ) and stock market performance ( $\beta=0.158$ ,  $t>1.96$  &  $p<0.05$ ) are controlled.

#### **4.6 Discussion**

From correlation analysis, while loan interest rate ( $r=0.578$ ) had a strong and positive correlation with credit risk among commercial banks, loan size ( $r=0.178$ ) as a loan characteristic had weak but positive relationship with credit risk. This implies that loan characteristics have positive correlation with credit risk among commercial banks in Kenya. This finding contradicts Jianchun (2009) who used a case of China and demonstrated that characteristics and credit risks are negatively connected. However, the result agree with Felix and Wachira (2018) who did an assessment of loan characteristics and their implication on loan defaulting with a focus on small and medium entities (SMEs) in Kitui and established existence of strong and positive interaction.

When control variables are considered, correlation analysis showed that while economic growth ( $r=-0.076$ ) had a weak and negative relationship with credit risk, stock market performance ( $r=0.318$ ) on the other hand had a moderate and positive relationship with credit risk. This finding is strongly supported by Skarica (2013) who noted that an improvement in economic growth would increase the income including salaries at household level and this is likely to improve the quality of loans of the lenders. On the contrary, a decline in economic growth would mean a reduction in cash flows at household level and this may force borrowers to prioritize consumptions as opposed to loan repayment this increasing the credit risk (Skarica, 2013). However, the result contradict with Wong, Wong and Leung (2010) who noted that there exists an inverse nexus between stock market index and the quality of loan portfolio of the lenders. A rise in stock returns provide an indication of enhanced ability to service loans by

borrowers and this would reduce the level of credit risk of the financial institution (Wong, Wong & Leung, 2010).

Regression results showed that 85.3% change in credit risk among commercial banks in Kenya can be explained by loan characteristics when economic growth and stock market performance are controlled (Adj.  $R^2=0.853$ ). Therefore, three quarter of credit risk incidences among commercial banks in Kenya is due to loan characteristics and other control variables. The findings of beta coefficient of regression analysis indicated that loan size ( $\beta=2.819$ ) exert more effect on credit risk of commercial banks in Kenya as a loan characteristics than loan interest rate ( $\beta=0.233$ ). This finding is in line with Muhammad, Bambale, Ibrahim and Sulaiman (2019) who focused on loan attributes, loan repayment and their implication on performance of SMEs where it emerged that the size and tenure of the loan have direct and significant interaction with repayment performance.

In terms of significance, the study noted that loan size ( $p<0.05$  &  $t>1.96$ ) and loan interest rate ( $p<0.05$  &  $t>1.96$ ) were significant loan characteristics predicting credit risk of commercial banks in Kenya. The finding is consistent with Jagongo (2019) who used a case of Higher Education Loans Board to appraise how loan characteristics influence loan performance and noted that the size and tenure of the loan significantly predict loan performance. However, the finding contradict with Kwang'a (2020) who used a case of HELB to provide the link existing between loan characteristics and repayment performance and shared that interest rate was insignificant predictor variable. Furthermore, economic growth ( $t>1.96$  &  $p<0.05$ ) and stock market performance ( $t>1.96$  &  $p<0.05$ ) were significant control variables.

It was shown that loan characteristics are significant predictors of credit risk among commercial banks in Kenya. This finding is consistent with some empirical studies including Jiménez and Saurina (2002) who focused on Spain to link loan characteristics and credit and obtained significant nexus. Lux and Tsolacos (2021) sought to determine how loan characteristics predicted default among commercial mortgage portfolios in UK and noted the attributes of lenders significantly determine the default probability of commercial mortgages. Muthoni, Mutuku and Riro (2017) did a study focusing on microfinance institutions to link loan characteristics and default of microcredit and obtained evidence that loan characteristics were significant predictors of default of microcredit.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The chapter is set out to summarize the findings of the study informed by the analyzed data. The conclusion and recommendations are also indicated besides limitations. The chapter also focuses on areas that require further research.

### **5.2 Summary**

The findings from descriptive statistics were that there was no significant disparity between the highest and lowest interest rate that commercial banks in Kenya charged on their loans as demonstrated by low values of standard deviations. Loan size as an aspect of loan characteristic has negligible contribution towards the growth of the economy. Within the period 2017-2021, the economic growth rate of Kenya was not stable but unsteady characterized by increased volatility. Stock markets in Kenya recorded steady performance in the period under consideration despite the aforementioned developments like the COVID-19 pandemic. Credit risk is a challenge among commercial banks in Kenya.

From correlation analysis, while loan interest rate had a strong and positive correlation with credit risk among commercial banks, loan size as a loan characteristic had weak but positive relationship with credit risk. This implies that loan characteristics have positive correlation with credit risk among commercial banks in Kenya. When control variables are considered, correlation analysis showed that while economic growth had a weak and negative relationship with credit risk, stock market performance on the other hand had a moderate and positive relationship with credit risk.

Regression results showed that over three quarter of credit risk incidences among commercial banks in Kenya is due to loan characteristics and other control variables. The findings of beta coefficient of regression analysis indicated that loan size exert more effect on credit risk of commercial banks in Kenya as a loan characteristics than loan interest rate. In terms of significance, the study noted that loan size and loan interest rate were significant loan characteristics predicting credit risk of commercial banks in Kenya. Furthermore, economic growth and stock market performance were significant control variables.

### **5.3 Conclusion**

Credit risk has remained a challenge among commercial banks in Kenya as demonstrated by an increase in NPLs. Credit risk is an expense to commercial banks as the amount in bad loans represents a tradeoff. NPLs are not a good indicator for the overall banking sector and the entire economy as a whole. Failure to address the rise in trend in credit of the commercial may in turn lead to a possible financial crisis.

Loan characteristics play an instrumental role as far as credit risk among commercial banks is concerned. In particular, loan size and loan interest rate are positive predictors and drivers of credit risk among commercial banks. The implication of this positive nexus is an increase in awareness of the loan characteristics by borrowers would improve the management of credit risk by commercial banks. It also implies that commercial banks can effectively manage their exposure to credit risk by careful design of the loan characteristics. This positive link also implies that the higher the amount of loan that a borrower borrows, the greater the probability of default and hence the higher the credit risk. Similarly, the higher the interest rates on loans those commercial banks can charge borrowers, the greater is the probability of default on loan

repayment thus an increase in credit risk. This conclusion is in sharp contrast with theoretical foundation of moral hazard and the adverse selection theory.

The role played by economic growth and stock market performance on credit risk of the commercial banks cannot be ignored. While economic growth had a negative beta, stock market performance had positive beta coefficient. This means while an improvement in economic growth rate contributes towards reduction in credit risk among commercial, a boom in stock market would on the contrary increase credit risk. When the economy grows, borrowers will have more net disposable income thus an increased repayment of loans which would lower credit risk among commercial banks.

#### **5.4 Recommendations of the Study**

The credit managers and loan managers working in commercial banks in Kenya should review their loan characteristics including the interest rate to allow customers repay their loans thus reducing exposure to credit risk. There is need for commercial banks to adopt modern lending practices involving in-depth quantitative appraisal of borrowers before a loan is advanced.

The policy makers at the CBK should have in place checks and balances to monitor compliance of commercial with credit risk guidelines. The policy makers at the Capital Market Authority (CMA) should put in place relevant policies to enhance performance of stock markets.

#### **5.5 Limitations of the Study**

This study was limited to three broad variables, the independent being loan characteristics, the control being economic growth and stock market performance and credit risk as the dependent variable. The study was limited to information from second hand sources over the period 2017-2021. The study was limited to 39 commercial banks with operations in Kenya.

## **5.6 Suggestions for Further Research**

The study suggests that aside from loan characteristics, the focus of future studies should be on other constructs like lending practices or attributes of the borrowers or lenders and their implication on credit risk. The focus of future studies should be on other financial institutions like deposit taking SACCOs or microfinance institutions. There is need to incorporate information from first hand and auxiliary sources to permit comparison of the findings.



## REFERENCES

- Blazy, R., & Weill, L. (2013). Why do banks ask for collateral in SME lending?. *Applied Financial Economics*, 23(13), 1109-1122.
- Boot, A. W., & Thakor, A. V. (1994). Moral hazard and secured lending in an infinitely repeated credit market game. *International economic review*, 899-920.
- Daoud, J. I. (2017, December). Multicollinearity and regression analysis. In *Journal of Physics: Conference Series* (Vol. 949, No. 1, p. 012009). IOP Publishing.
- Felix, S. S., & Wachira, K. (2018). Lender characteristics influencing loan default by SMEs in Kitui Central Sub-County. *Journal of Business Management and Economic Research (IJBMER)*, 9(6), 1501-1509.
- Ghulam, Y., Dhruva, K., Naseem, S., & Hill, S. (2018). The interaction of borrower and loan characteristics in predicting risks of subprime automobile loans. *Risks*, 6(3), 101.
- Glejser, H. (1969). A new test for heteroskedasticity. *Journal of the American Statistical Association*, 64(325), 316-323.
- Haitovsky, Y. (1969). Multicollinearity in regression analysis: Comment. *The Review of economics and statistics*, 486-489.
- Haldane, A., & Scheibe, J. (2004). IMF lending and creditor moral hazard.
- Hansen, B. (1999). Testing for linearity. *Journal of economic surveys*, 13(5), 551-576.
- Jagongo, A. (2019). Loan Characteristic and Loan Performance at Higher Education Loans Board in Kenya. *International Journal of Business and Social Science*, 10(11).
- Jianchun, M. (2009). The impact of loan characteristics on credit risk of Chinese listed firms under the new Banking Regulatory System.
- Jiménez, G., & Saurina, J. (2002). Loan characteristics and credit risk. *Bank of Spain*, 1-34.

- Kwang'a, M. A. (2020). *Loan Characteristics And Repayment Performance At The Higher Education Loans Board In Kenya* (Doctoral Dissertation, Kenyatta University).
- Laffont, J. J., & Rey, P. (2003). Moral hazard, collusion and group lending.
- Lux, N., & Tsolacos, S. (2021). Loan Characteristics as Predictors of Default in Commercial Mortgage Portfolios. *International Journal of Economics and Financial Research*, (71).
- Mehrteab, H. T. (2005). *Adverse selection and moral hazard in group-based lending: Evidence from eritrea* (Doctoral dissertation, Centre for Development Studies, University of Groningen).
- Muhammad, I. B., Bambale, A. J. A., Ibrahim, M. A., & Sulaiman, S. A. (2019). Loan characteristics, loan repayment and performance of small and medium enterprises in Kano metropolitan: A mediating model. *Journal of Finance, Accounting and Management*, 10(1), 43-56.
- Muthoni, M. P., Mutuku, L., & Riro, G. K. (2017). Influence of loan characteristics on Microcredit Default in Kenya: A comparative analysis of Microfinance Institutions and Financial Intermediaries.
- Mwangi, B. W. & Muturi, W. (2016). Effects of credit risk management on loan repayment performance of commercial banks in Kenya. *International Academic Journal of Economics and Finance*, 2 (2), 1-24
- Nyasaka, F. O. (2017). *The relationship between credit risk management practices and non-performing loans in Kenyan commercial banks: A case study of KCB group limited* (Doctoral dissertation, United States International University-Africa).
- Pagan, A. R., & Hall, A. D. (1983). Diagnostic tests as residual analysis. *Econometric Reviews*, 2(2), 159-218.

- Rosen, R. J. (2011). Competition in mortgage markets: The effect of lender type on loan characteristics. *Economic Perspectives*, 35(1).
- Simtowe, F., Zeller, M., & Phiri, A. (2006). Determinants of moral hazard in microfinance: Empirical evidence from joint liability lending programs in Malawi. *African review of money finance and banking*, 5-38.
- Villar Burke, J. (2015). Impact of loan contract characteristics on monetary transmission and consumer rent. *Available at SSRN 2535571*.
- White, K. J. (1992). The Durbin-Watson test for autocorrelation in nonlinear models. *The Review of Economics and Statistics*, 370-373.
- Yazici, B., & Yolacan, S. (2007). A comparison of various tests of normality. *Journal of Statistical Computation and Simulation*, 77(2), 175-183.
- Zeileis, A., & Hothorn, T. (2002). Diagnostic checking in regression relationships.

## APPENDICES

### Appendix I: Data Collection Sheet

<b>Indicator</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Average interest rate on lending (%)					
Total loans (Kshs)					
GDP (Kshs)					
GDP growth rate (%)					
Returns on NSE-20 Share index (Kshs)					
NPLs (Kshs)					

## **Appendix II: List of Commercial Banks in Nairobi**

1. KCB Bank Kenya Ltd
2. Co-operative Bank of Kenya Ltd
3. Equity Bank Kenya Ltd
4. I & M Bank Ltd
5. Absa Bank Kenya Plc
6. Standard Chartered Bank Kenya Ltd
7. NCBA Bank Kenya PLC
8. Stanbic Bank Kenya Ltd
9. Bank of Baroda (Kenya) Limited
10. Citibank N.A. Kenya
11. Diamond Trust Bank Kenya Limited
12. Bank of India
13. Prime Bank Ltd
14. Family Bank Ltd.
15. SBM Bank Kenya Ltd
16. Gulf African Bank Ltd
17. Guaranty Trust Bank Ltd
18. Victoria Commercial Bank Limited
19. Habib Bank AG Zurich
20. National Bank of Kenya Ltd
21. First Community Bank Ltd
22. African Banking Corporation Ltd

23. Middle East Bank (K) Ltd
24. Sidian Bank Ltd
25. Paramount Bank Ltd
26. Guardian Bank Limited
27. UBA Kenya Bank Ltd
28. M-Oriental Commercial Bank Ltd
29. Development Bank of Kenya Ltd
30. Credit Bank Ltd
31. Ecobank Kenya Ltd
32. Kingdom Bank Ltd
33. Consolidated Bank of Kenya Limited
34. Mayfair CIB Bank Ltd
35. Bank of Africa (K) Ltd
36. DIB Bank Kenya Ltd
37. HFC Ltd
38. Spire Bank Limited
39. Access Bank Plc
40. Imperial Bank Ltd\*
41. Chase Bank (K) Ltd\*\*
42. Charterhouse Bank Ltd\*\*

\*Bank in Receivership

\*\*Banks in Liquidation

Source: CBK (2021)

### Appendix III: Raw Data Collected

<b>Bank</b>	<b>Year</b>	<b>Loan Interest Rate</b>	<b>Loan size</b>	<b>Economic growth</b>	<b>Stock market performance</b>	<b>Credit risk</b>
KCB Bank Kenya Ltd	2017	13.668	0.052	3.800	3.111	0.083
Co-operative Bank of Kenya Ltd	2017	13.668	0.033	3.800	3.111	0.071
Equity Bank Kenya Ltd	2017	13.668	0.028	3.800	3.111	0.067
I & M Bank Ltd	2017	13.668	0.016	3.800	3.111	0.139
Absa Bank Kenya Plc	2017	13.668	0.022	3.800	3.111	0.071
Standard Chartered Bank Kenya Ltd	2017	13.668	0.018	3.800	3.111	0.126
NCBA Bank Kenya PLC	2017	13.668	0.014	3.800	3.111	0.073
Stanbic Bank Kenya Ltd	2017	13.668	0.017	3.800	3.111	0.076
Bank of Baroda (Kenya) Limited	2017	13.668	0.006	3.800	3.111	0.061
Citibank N.A. Kenya	2017	13.668	0.005	3.800	3.111	0.045
Diamond Trust Bank Kenya Limited	2017	13.668	0.020	3.800	3.111	0.076
Bank of India	2017	13.668	0.003	3.800	3.111	0.021
Prime Bank Ltd	2017	13.668	0.005	3.800	3.111	0.057
Family Bank Ltd.	2017	13.668	0.006	3.800	3.111	0.202
SBM Bank Kenya Ltd	2017	13.668	0.001	3.800	3.111	0.586
Gulf African Bank Ltd	2017	13.668	0.003	3.800	3.111	0.097
Guaranty Trust Bank Ltd	2017	13.668	0.002	3.800	3.111	0.103

Victoria Commercial Bank Limited	2017	13.668	0.002	3.800	3.111	0.001
Habib Bank AG Zurich	2017	13.668	0.001	3.800	3.111	0.104
National Bank of Kenya Ltd	2017	13.668	0.009	3.800	3.111	0.406
First Community Bank Ltd	2017	13.668	0.001	3.800	3.111	0.400
African Banking Corporation Ltd	2017	13.668	0.002	3.800	3.111	0.216
Middle East Bank (K) Ltd	2017	13.668	0.000	3.800	3.111	0.444
Sidian Bank Ltd	2017	13.668	0.002	3.800	3.111	0.211
Paramount Bank Ltd	2017	13.668	0.001	3.800	3.111	0.123
Guardian Bank Limited	2017	13.668	0.001	3.800	3.111	0.109
UBA Kenya Bank Ltd	2017	13.668	0.000	3.800	3.111	0.046
M-Oriental Commercial Bank Ltd	2017	13.668	0.001	3.800	3.111	0.105
Development Bank of Kenya Ltd	2017	13.668	0.001	3.800	3.111	0.216
Credit Bank Ltd	2017	13.668	0.001	3.800	3.111	0.086
Ecobank Kenya Ltd	2017	13.668	0.003	3.800	3.111	0.386
Kingdom Bank Ltd	2017	13.668	0.001	3.800	3.111	0.212
Consolidated Bank of Kenya Limited	2017	13.668	0.001	3.800	3.111	0.251
Mayfair CIB Bank Ltd	2017	13.668	0.000	3.800	3.111	0.047
Bank of Africa (K) Ltd	2017	13.668	0.004	3.800	3.111	0.315
DIB Bank Kenya Ltd	2017	13.668	0.000	3.800	3.111	0.306
HFC Ltd	2017	13.668	0.007	3.800	3.111	0.156
Spire Bank Limited	2017	13.668	0.001	3.800	3.111	0.342



Access Bank Plc	2017	13.668	0.001	3.800	3.111	0.217
KCB Bank Kenya Ltd	2018	13.061	0.052	5.600	3.061	0.069
Co-operative Bank of Kenya Ltd	2018	13.061	0.031	5.600	3.061	0.112
Equity Bank Kenya Ltd	2018	13.061	0.028	5.600	3.061	0.074
I & M Bank Ltd	2018	13.061	0.017	5.600	3.061	0.146
Absa Bank Kenya Plc	2018	13.061	0.022	5.600	3.061	0.074
Standard Chartered Bank Kenya Ltd	2018	13.061	0.016	5.600	3.061	0.163
NCBA Bank Kenya PLC	2018	13.061	0.014	5.600	3.061	0.078
Stanbic Bank Kenya Ltd	2018	13.061	0.019	5.600	3.061	0.107
Bank of Baroda (Kenya) Limited	2018	13.061	0.005	5.600	3.061	0.090
Citibank N.A. Kenya	2018	13.061	0.003	5.600	3.061	0.030
Diamond Trust Bank Kenya Limited	2018	13.061	0.018	5.600	3.061	0.072
Bank of India	2018	13.061	0.002	5.600	3.061	0.070
Prime Bank Ltd	2018	13.061	0.005	5.600	3.061	0.074
Family Bank Ltd.	2018	13.061	0.006	5.600	3.061	0.173
SBM Bank Kenya Ltd	2018	13.061	0.003	5.600	3.061	0.691
Gulf African Bank Ltd	2018	13.061	0.003	5.600	3.061	0.109
Guaranty Trust Bank Ltd	2018	13.061	0.002	5.600	3.061	0.189
Victoria Commercial Bank Limited	2018	13.061	0.003	5.600	3.061	0.031
Habib Bank AG Zurich	2018	13.061	0.001	5.600	3.061	0.090

National Bank of Kenya Ltd	2018	13.061	0.008	5.600	3.061	0.476
First Community Bank Ltd	2018	13.061	0.001	5.600	3.061	0.462
African Banking Corporation Ltd	2018	13.061	0.001	5.600	3.061	0.401
Middle East Bank (K) Ltd	2018	13.061	0.000	5.600	3.061	0.400
Sidian Bank Ltd	2018	13.061	0.002	5.600	3.061	0.209
Paramount Bank Ltd	2018	13.061	0.001	5.600	3.061	0.173
Guardian Bank Limited	2018	13.061	0.001	5.600	3.061	0.099
UBA Kenya Bank Ltd	2018	13.061	0.000	5.600	3.061	0.128
M-Oriental Commercial Bank Ltd	2018	13.061	0.001	5.600	3.061	0.096
Development Bank of Kenya Ltd	2018	13.061	0.001	5.600	3.061	0.287
Credit Bank Ltd	2018	13.061	0.002	5.600	3.061	0.083
Ecobank Kenya Ltd	2018	13.061	0.002	5.600	3.061	0.217
Kingdom Bank Ltd	2018	13.061	0.001	5.600	3.061	0.696
Consolidated Bank of Kenya Limited	2018	13.061	0.001	5.600	3.061	0.253
Mayfair CIB Bank Ltd	2018	13.061	0.000	5.600	3.061	0.306
Bank of Africa (K) Ltd	2018	13.061	0.003	5.600	3.061	0.362
DIB Bank Kenya Ltd	2018	13.061	0.000	5.600	3.061	0.466
HFC Ltd	2018	13.061	0.006	5.600	3.061	0.271
Spire Bank Limited	2018	13.061	0.001	5.600	3.061	0.440
Access Bank Plc	2018	13.061	0.001	5.600	3.061	0.242
KCB Bank Kenya Ltd	2019	12.441	0.054	5.000	3.256	0.074
Co-operative Bank of Kenya Ltd	2019	12.441	0.032	5.000	3.256	0.111

Equity Bank Kenya Ltd	2019	12.441	0.033	5.000	3.256	0.090
I & M Bank Ltd	2019	12.441	0.017	5.000	3.256	0.123
Absa Bank Kenya Plc	2019	12.441	0.023	5.000	3.256	0.066
Standard Chartered Bank Kenya Ltd	2019	12.441	0.017	5.000	3.256	0.139
NCBA Bank Kenya PLC	2019	12.441	0.028	5.000	3.256	0.125
Stanbic Bank Kenya Ltd	2019	12.441	0.019	5.000	3.256	0.118
Bank of Baroda (Kenya) Limited	2019	12.441	0.006	5.000	3.256	0.084
Citibank N.A. Kenya	2019	12.441	0.003	5.000	3.256	0.041
Diamond Trust Bank Kenya Limited	2019	12.441	0.018	5.000	3.256	0.083
Bank of India	2019	12.441	0.002	5.000	3.256	0.089
Prime Bank Ltd	2019	12.441	0.004	5.000	3.256	0.117
Family Bank Ltd.	2019	12.441	0.006	5.000	3.256	0.152
SBM Bank Kenya Ltd	2019	12.441	0.003	5.000	3.256	0.550
Gulf African Bank Ltd	2019	12.441	0.003	5.000	3.256	0.147
Guaranty Trust Bank Ltd	2019	12.441	0.002	5.000	3.256	0.185
Victoria Commercial Bank Limited	2019	12.441	0.003	5.000	3.256	0.049
Habib Bank AG Zurich	2019	12.441	0.001	5.000	3.256	0.112
National Bank of Kenya Ltd	2019	12.441	0.007	5.000	3.256	0.415
First Community Bank Ltd	2019	12.441	0.001	5.000	3.256	0.397
African Banking Corporation Ltd	2019	12.441	0.002	5.000	3.256	0.177

Middle East Bank (K) Ltd	2019	12.441	0.001	5.000	3.256	0.141
Sidian Bank Ltd	2019	12.441	0.002	5.000	3.256	0.206
Paramount Bank Ltd	2019	12.441	0.001	5.000	3.256	0.176
Guardian Bank Limited	2019	12.441	0.001	5.000	3.256	0.095
UBA Kenya Bank Ltd	2019	12.441	0.000	5.000	3.256	0.230
M-Oriental Commercial Bank Ltd	2019	12.441	0.001	5.000	3.256	0.189
Development Bank of Kenya Ltd	2019	12.441	0.001	5.000	3.256	0.341
Credit Bank Ltd	2019	12.441	0.002	5.000	3.256	0.101
Ecobank Kenya Ltd	2019	12.441	0.003	5.000	3.256	0.198
Kingdom Bank Ltd	2019	12.441	0.001	5.000	3.256	0.565
Consolidated Bank of Kenya Limited	2019	12.441	0.001	5.000	3.256	0.295
Mayfair CIB Bank Ltd	2019	12.441	0.001	5.000	3.256	0.015
Bank of Africa (K) Ltd	2019	12.441	0.003	5.000	3.256	0.399
DIB Bank Kenya Ltd	2019	12.441	0.001	5.000	3.256	0.010
HFC Ltd	2019	12.441	0.005	5.000	3.256	0.269
Spire Bank Limited	2019	12.441	0.001	5.000	3.256	0.515
Access Bank Plc	2019	12.441	0.001	5.000	3.256	0.176
KCB Bank Kenya Ltd	2020	11.996	0.063	-0.300	3.200	0.123
Co-operative Bank of Kenya Ltd	2020	11.996	0.035	-0.300	3.200	0.168
Equity Bank Kenya Ltd	2020	11.996	0.041	-0.300	3.200	0.120
I & M Bank Ltd	2020	11.996	0.018	-0.300	3.200	0.126
Absa Bank Kenya Plc	2020	11.996	0.026	-0.300	3.200	0.074

Standard Chartered Bank Kenya Ltd	2020	11.996	0.018	-0.300	3.200	0.146
NCBA Bank Kenya PLC	2020	11.996	0.030	-0.300	3.200	0.139
Stanbic Bank Kenya Ltd	2020	11.996	0.020	-0.300	3.200	0.142
Bank of Baroda (Kenya) Limited	2020	11.996	0.006	-0.300	3.200	0.124
Citibank N.A. Kenya	2020	11.996	0.005	-0.300	3.200	0.028
Diamond Trust Bank Kenya Limited	2020	11.996	0.019	-0.300	3.200	0.119
Bank of India	2020	11.996	0.002	-0.300	3.200	0.047
Prime Bank Ltd	2020	11.996	0.005	-0.300	3.200	0.109
Family Bank Ltd.	2020	11.996	0.007	-0.300	3.200	0.149
SBM Bank Kenya Ltd	2020	11.996	0.004	-0.300	3.200	0.441
Gulf African Bank Ltd	2020	11.996	0.003	-0.300	3.200	0.176
Guaranty Trust Bank Ltd	2020	11.996	0.002	-0.300	3.200	0.208
Victoria Commercial Bank Limited	2020	11.996	0.003	-0.300	3.200	0.066
Habib Bank AG Zurich	2020	11.996	0.001	-0.300	3.200	0.122
National Bank of Kenya Ltd	2020	11.996	0.009	-0.300	3.200	0.354
First Community Bank Ltd	2020	11.996	0.002	-0.300	3.200	0.361
African Banking Corporation Ltd	2020	11.996	0.003	-0.300	3.200	0.156
Middle East Bank (K) Ltd	2020	11.996	0.001	-0.300	3.200	0.103
Sidian Bank Ltd	2020	11.996	0.002	-0.300	3.200	0.115
Paramount Bank Ltd	2020	11.996	0.001	-0.300	3.200	0.171

Guardian Bank Limited	2020	11.996	0.001	-0.300	3.200	0.128
UBA Kenya Bank Ltd	2020	11.996	0.000	-0.300	3.200	0.407
M-Oriental Commercial Bank Ltd	2020	11.996	0.001	-0.300	3.200	0.234
Development Bank of Kenya Ltd	2020	11.996	0.001	-0.300	3.200	0.337
Credit Bank Ltd	2020	11.996	0.002	-0.300	3.200	0.115
Ecobank Kenya Ltd	2020	11.996	0.003	-0.300	3.200	0.163
Kingdom Bank Ltd	2020	11.996	0.001	-0.300	3.200	0.762
Consolidated Bank of Kenya Limited	2020	11.996	0.001	-0.300	3.200	0.240
Mayfair CIB Bank Ltd	2020	11.996	0.001	-0.300	3.200	0.026
Bank of Africa (K) Ltd	2020	11.996	0.003	-0.300	3.200	0.398
DIB Bank Kenya Ltd	2020	11.996	0.001	-0.300	3.200	0.014
HFC Ltd	2020	11.996	0.005	-0.300	3.200	0.258
Spire Bank Limited	2020	11.996	0.000	-0.300	3.200	0.708
Access Bank Plc	2020	11.996	0.000	-0.300	3.200	0.046
KCB Bank Kenya Ltd	2021	12.080	0.045	7.500	3.111	0.219
Co-operative Bank of Kenya Ltd	2021	12.080	0.036	7.500	3.111	0.130
Equity Bank Kenya Ltd	2021	12.080	0.045	7.500	3.111	0.084
I & M Bank Ltd	2021	12.080	0.018	7.500	3.111	0.108
Absa Bank Kenya Plc	2021	12.080	0.027	7.500	3.111	0.077
Standard Chartered Bank Kenya Ltd	2021	12.080	0.016	7.500	3.111	0.157
NCBA Bank Kenya PLC	2021	12.080	0.027	7.500	3.111	0.160

Stanbic Bank Kenya Ltd	2021	12.080	0.021	7.500	3.111	0.112
Bank of Baroda (Kenya) Limited	2021	12.080	0.006	7.500	3.111	0.105
Citibank N.A. Kenya	2021	12.080	0.006	7.500	3.111	0.019
Diamond Trust Bank Kenya Limited	2021	12.080	0.018	7.500	3.111	0.158
Bank of India	2021	12.080	0.002	7.500	3.111	0.028
Prime Bank Ltd	2021	12.080	0.005	7.500	3.111	0.109
Family Bank Ltd.	2021	12.080	0.008	7.500	3.111	0.150
SBM Bank Kenya Ltd	2021	12.080	0.004	7.500	3.111	0.344
Gulf African Bank Ltd	2021	12.080	0.002	7.500	3.111	0.161
Guaranty Trust Bank Ltd	2021	12.080	0.002	7.500	3.111	0.138
Victoria Commercial Bank Limited	2021	12.080	0.003	7.500	3.111	0.139
Habib Bank AG Zurich	2021	12.080	0.001	7.500	3.111	0.116
National Bank of Kenya Ltd	2021	12.080	0.008	7.500	3.111	0.335
First Community Bank Ltd	2021	12.080	0.002	7.500	3.111	0.288
African Banking Corporation Ltd	2021	12.080	0.003	7.500	3.111	0.197
Middle East Bank (K) Ltd	2021	12.080	0.001	7.500	3.111	0.079
Sidian Bank Ltd	2021	12.080	0.003	7.500	3.111	0.118
Paramount Bank Ltd	2021	12.080	0.001	7.500	3.111	0.191
Guardian Bank Limited	2021	12.080	0.001	7.500	3.111	0.164
UBA Kenya Bank Ltd	2021	12.080	0.000	7.500	3.111	0.478
M-Oriental Commercial Bank Ltd	2021	12.080	0.001	7.500	3.111	0.268

Development Bank of Kenya Ltd	2021	12.080	0.001	7.500	3.111	0.293
Credit Bank Ltd	2021	12.080	0.002	7.500	3.111	0.282
Ecobank Kenya Ltd	2021	12.080	0.003	7.500	3.111	0.161
Kingdom Bank Ltd	2021	12.080	0.001	7.500	3.111	0.745
Consolidated Bank of Kenya Limited	2021	12.080	0.001	7.500	3.111	0.275
Mayfair CIB Bank Ltd	2021	12.080	0.001	7.500	3.111	0.038
Bank of Africa (K) Ltd	2021	12.080	0.003	7.500	3.111	0.317
DIB Bank Kenya Ltd	2021	12.080	0.001	7.500	3.111	0.150
HFC Ltd	2021	12.080	0.004	7.500	3.111	0.220
Spire Bank Limited	2021	12.080	0.000	7.500	3.111	0.760
Access Bank Plc	2021	12.080	0.000	7.500	3.111	0.065