

**DETERMINANTS OF LOAN VOLUMES AMONG
COMMERCIAL BANKS IN KENYA**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF
NAIROBI**

2019

DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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This research project has been submitted for examination with my approval as the University Supervisor.

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ACKNOWLEDGEMENTS

To begin with, I thank the almighty God for his grace and providence which has enabled me to undertake this project that was involving in terms of time and resources.

I express my sincere gratitude to my family for their encouragement and support while undertaking the project.

Special thanks go to my supervisor, Prof. Mirie Mwangi for his tireless efforts, guidance, dedication, motivation and valuable critique to this work which was critical to ensure the success of this project.

And to my fellow MBA colleagues, to whom I am deeply indebted for your valuable support and suggestions throughout the study period. You greatly contributed to positively changing my way of thinking and analysis of situations as well as making my academic journey possible.

DEDICATION

This project is dedicated to my dear husband, Eric and our sons Eddy, Ian and Alvin for their encouragement, financial and moral support throughout this project. May the Almighty God bless you abundantly.

TABLE OF CONTENTS

DECLARATION.....	ii
ACKNOWLEDGEMENTS	iii
DEDICATION.....	iv
LIST OF TABLES	vii
ABBREVIATIONS AND ACRONYMS.....	viii
ABSTRACT	ix
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study	1
1.1.1 Determinants of Loan Volumes	2
1.1.2 Loan Volumes	3
1.1.3 Loan Volumes and Its Determinants.....	4
1.1.4 Commercial Banks in Kenya	5
1.2 Research Problem.....	7
1.3 Research Objective.....	9
1.4 Value of the Study	9
CHAPTER TWO: LITERATURE REVIEW.....	10
2.1 Introduction	10
2.2 Theoretical Framework.....	10
2.2.1 Loanable Funds Theory of Interest Rates	10
2.2.2 Adverse Selection Theory.....	11
2.2.3 Liquidity Preference Theory	12
2.3 Determinants of Loan Volumes.....	13
2.3.1 Interest Rates.....	13
2.3.2 Bank Size	14
2.3.3 Credit Risk	15
2.3.4 Bank Liquidity	15
2.3.5 Volume of Deposits	16
2.4 Empirical Review	17
2.4.1 Global Studies	17
2.4.2 Local Studies.....	18
2.5 Conceptual Framework.....	20
2.6 Summary of the Literature Review	21
CHAPTER THREE: RESEARCH METHODOLOGY	23
3.1 Introduction	23
3.2 Research Design.....	23

3.3 Population	23
3.4 Data Collection.....	23
3.5 Diagnostic Tests.....	24
3.6 Data Analysis.....	24
3.6.1 Analytical Model	25
3.6.2 Tests of Significance.....	25
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION	26
4.1 Introduction	26
4.2 Descriptive Analysis	26
4.3 Diagnostic Tests.....	27
4.3.1 Multicollinearity Test.....	27
4.3.2 Normality Test	28
4.3.3 Autocorrelation Test	28
4.4 Correlation Analysis	29
4.5 Regression Analysis.....	30
4.6 Discussion of Research Findings	34
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	36
5.1 Introduction	36
5.2 Summary of Findings	36
5.3 Conclusion	38
5.4 Recommendations of the Study.....	39
5.5 Limitations of the Study	40
5.6 Suggestions for Further Research	41
REFERENCES.....	42
APPENDICES	47
Appendix I: Commercial Banks in Kenya.....	47
Appendix II: Research Data.....	49

LIST OF TABLES

Table 4.1: Descriptive Statistics	26
Table 4.2: Multicollinearity Test	27
Table 4.3: Normality Test	28
Table 4.4: Autocorrelation Test	29
Table 4.5: Correlation Analysis	30
Table 4.6: Model Summary	31
Table 4.7: ANOVA	32
Table 4.8: Model Coefficients	32

ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
CBK	Central Bank of Kenya
FASB	Financial Accounting Standards Board
FDI	Foreign Direct Investments
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
IRC	Interest Rate Capping
MFI	Micro Finance Institutions
MSE	Micro and Small Enterprises
NSE	Nairobi Securities Exchange
SEC	Securities and Exchange Commission
SME	Small and Micro Enterprises
VIF	Variance Inflation Factors

ABSTRACT

Various factors, theoretically, influence the loan volumes among banks. These factors include interest rates, bank size, credit risk, liquidity and volume of deposits. Other factors are borrower's characteristics such as gender, age, wealth, experience and credit history, risk profile, earnings and business experience, and finally loan characteristics, such as loan amount, maturity, interest rate and collateral offered. This study sought to establish determinants of loan volumes among commercial banks in Kenya. 43 commercial banks in operation in Kenya as at 31st December 2018 were the population of the study. Data from 38 banks was availed for the study which was 88.37% response rate. The predictor variables were interest rates, bank size, credit risk, liquidity and volume of deposits. Loan volume was the dependent variable. Secondary data was acquired for 5 years (January 2014 to December 2018) on an annual basis. Research design was descriptive cross-sectional design whereas association between variables was determined by multiple linear regression model. SPSS version 22 was used in data analysis. An R-square value of 0.830 that can be translated to mean 83% of the variations in loan volumes among banks in Kenya can be related to the five chosen predictor variables whereas 17% in the changes of loan volumes among banks was linked to other variables that did not form part of this study. From the study it was further revealed that the predictor variables strongly correlated with loan volumes ($R=0.911$). ANOVA revealed that the F statistic showed significance at 5% level with a $p=0.000$. Henceforth, the model was appropriate in providing an explanation of the relationship between the variables. Additionally, results demonstrated that bank size, liquidity and volume of deposits were positively and statistically substantial values in the study. Credit risk was found to have a negative but not statistically significant influence on loan volumes. The study further found that interest rates have a statistically insignificant influence on loan volumes among banks. The recommendation is that measures should be set up to increase bank size, liquidity and volume of deposits as these three have a significant influence on loan volumes.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Total loans and advances are perceived to be the assets for the bank. As such the rise in lending to the public by banks directly implies the growth in the balance sheet for the bank and ultimately improved financial performance via increased interest income on the loans and advances by the bank. On the other hand, increased bank lending to the public implies welfare to the public via increased access to loans and advance that in turn increases their personal household consumption (Loderer, 2009). Theoretically, various factors influence the loan volumes among banks. These factors include interest rates, bank size, credit risk, liquidity and volume of deposits (Mole & Namusonge, 2016).

Three theories formed the basis of this study and they include; liquidity preference theory, the adverse selection theory as well as the loanable funds theory. Liquidity preference theory determines the combination of assets and liabilities that an entity can hold. Therefore, a bank's decision problem will therefore be on how to balance returns and liquidity, consequently growing its returns (Dafermos, 2009). The theory of adverse selection describes the scenario of a bank which is unable to isolate the risky borrowers from safe borrowers. The bank which is lends in this theory has inadequate information about the loan customers (Pagano & Jappelli, 1993). Loanable funds theory supports that interest rates spread determination is founded on the market forces of demand and supply of loanable funds. Equilibrium rate of interest is recognized as level that equalizes supply and demand for loanable funds (Oost, 2002).

Provision of credit is the main role of commercial banks across the world; however it has been proven historically that commercial banks ration credit even to creditworthy

borrowers. In Kenya, only 2.5 percent of Micro and Small Enterprises (MSEs) get loans from commercial banks (International Centre for Economic Growth, 2017). Commercial banks act as financial intermediaries dominating the financial institutions sector by fulfilling various significant roles. One key function is acting as a broker and through this role all the parties involved enjoy reduced costs. Another role they perform is funds transformation through enticing funds from the government, business and designing them as financial products like loans, to fit the various borrower's needs. Banks also lend to their peers and clients, thus being able to diversify and as a result, reduce their risks and that of their clients. Banks are the primary means of doing payments (Mcmenamin, 2017).

1.1.1 Determinants of Loan Volumes

Determinants of loan volumes refer to those factors that influence bank's lending levels (Sill, 1996). Lapar and Graham (1988) classified these factors to observable characteristics such as gender, age, wealth, experience and credit history, firm's characteristics such as risk profile, earning and business experience, and finally characteristics of loans such as collateral, amount demanded, collateral placed and rate of interest. The willingness of banks to advance loans is mostly influenced by the level of risk of a firm (Hoff & Stiglitz, 1990).

Stiglitz and Weiss (2001) posit that loan pricing or interest rate is a key factor that is put into consideration in the process of lending decision by the lender and the borrower. Banks cannot levy loan charges that are too low which will not be adequate to cover for the general expenses, the interest paid on customers' deposits and the loss of revenue from non-performing loan book. Likewise, they cannot levy too high charges that will disallow any meaningful relationship with their clients. The pricing model should factor the adverse selection and a moral hazard incidence from setting in since it is extremely

difficult to gauge the behavior of individuals and firms from the onset of the relationship.

Murerwa (2015) asserts that a positive correlation is in existence between the adequate level of bank liquidity and lending levels. Liquid asset protect firms against deposits that might require on demand payment and thus firm liquidity minimizes risk. However, liquid assets reduce the amount of funds for lending which in turn reduces bank profitability and in essence growth indicating negative relationship liquidity and lending levels. Magweva and Marime (2016) posit that credit risk significantly influences the loan volumes of the banks by affecting the interest income they generate. Credit risk negatively affects the lending levels both in short and long run by reducing available funds for lending.

1.1.2 Loan Volumes

Loan volumes represent combined loan amounts possessed in a financial entity (Barnor, 2014). It may also be loans owed to lenders, mostly labelled as assets on the statement of financial position (Khan & Sattar, 2014). Credits generate considerable resources, and banks could incorporate this into their reports as some of the best sources of income. In light of this, banks may face risks of liquidity as any progress on assets depends on clients (Kithinji, 2010). Hamisu (2011) notes how generating credit without is potentially risky to both lenders and creditors. One of this risks is one party failing to adhere to the agreement on the required period will greatly jeopardize bank's businesses, hindering it from smooth operations. On one hand, operating accounts of high credit standing and corresponding chance with high liquidation risk places contributors' assets in great risk.

Total loans and advances are perceived to be the assets for the bank. As such the rise in lending to the public by banks directly implies the growth in the balance sheet for the bank and ultimately improved financial performance via increased interest income on the loans and advances by the bank. On the other hand, increased bank lending to the public implies welfare to the public via increased access to loans and advance that in turn increases their personal household consumption. As such the size of the bank, amount of demand deposits, credit risk and the level of the bank's capitalization all have a bearing in influencing resources available for lending to the public (Loderer, 2009).

There are no specific measures of a bank's loan levels. However, going by the changes that occurs in the financial statements these are the financial position statement and comprehensive income statement, one can determine whether the firm bank loan levels are increasing or not. The key indicators to establish the growth of credit level is increase in total assets which is given by increase in loans, advances and interest income (Loderer, 2009). This study will measure loan volume using loan book value in a given period.

1.1.3 Loan Volumes and Its Determinants

Various factors, theoretically, influence the loan volumes among banks. These factors include interest rates, bank size, credit risk, liquidity and volume of deposits. Other factors are borrower's characteristics such as gender, age, wealth, experience and credit history, risk profile, earning and business experience, and finally loan characteristics, such as loan amount, maturity, interest rate and collateral offered. Lapar and Graham (1988) categorized the loan volumes of banks against the demand for loans by firm into three stages which include the screening, evaluation and quantity rationing stage. Based on the information obtained, a decision is made by the loan officer on whether to grant

the loan or decline depending on the profitability to the bank. The bank, at the quantity rationing stage, determines the best loan size at a certain interest rate.

Diamond and Rajan (2006) holds that the cost of borrowing is reduced by low interest rate, which in turn drives the investment activities and high consumer durables purchase. Banks may also ease lending policy given an expectation that economic activities will strengthen, thereby boosting spending power by businesses and households. Low interest rate may trigger investing into stocks, raising households' financial assets. The impact of this may be increased consumer spending, making firms' investment projects more attractive. The main concern for the empirical analysis arises from the fact that banks heterogeneously react to changes in monetary policy. These varied responses by commercial banks emanate from their diverse balance sheet dynamics. There are therefore other mechanisms that play an important role in influencing bank's lending activities despite change of policy on interest rate such as liquidity levels and bank size (Bolton & Freixas, 2006).

According to Kamande (2017) the level of capital adequacy directly affects bank's lending levels by determining its ability to expand to risky areas. The higher the CAR, the lower the risk and the higher the profitability due to ability to absorb losses and minimize risk exposure. However, over reliance on the CAR might reduce bank profitability by reducing the need for deposits and other cheaper sources of capital leading to slowed lending levels. Banks therefore need to ensure they maintain a quality portfolio of these assets as it determines their lending levels (Dang, 2011).

1.1.4 Commercial Banks in Kenya

Central Bank of Kenya (CBK) defines a bank as a business which carries out, or intends to conduct banking activities in Kenya. Commercial banking business involves

accepting deposits, giving credit, money remittances and any other financial services. The industry performs one of the very important role in the financial sector with a lot of emphasizes on mobilizing of savings and credit provision in the economy. According to the Bank Supervision Yearly Report (2018), the banking industry comprises of the CBK as the legislative authority. The industry also has 1 mortgage finance, 43 commercial banks and 13 microfinance banks. Among the 43 commercial banks in the country, 30 have local ownership while 13 have foreign ownership. 11 of the 42 are listed at the NSE.

All commercial banks are expected to adhere to specific regulations like loan to deposit ratio, lowest cash reserves and liquidity ratios with the central bank. The controller has the obligation to make sure that commercial banks uphold the necessary liquidity parameters, remains solvent and function efficiently and effectively so as to benefit all stakeholders. The checks and licensing of commercial banks is provided by the Act of Banking containing the rules and regulations to be followed and observed. The industry of banking has been reserved as a main pillar to the accomplishment of vision 2030 through improved savings, encouragement of FDI which will conserve the economy and boost Kenya as a country financially as one of the best in Africa (The National Treasury, 2016).

Kenyan financial sector being liberal means that imperfect information exists in the credit markets and this may assist banks to maximize their profits by explaining their lending behavior. Instances when the demand for loans exceed the supply and the borrowers do to receive loans or receive an amount less than what they applied for at the current market interest rates, credit rationing is said to have occurred (Hoff & Stiglitz, 1990). This limited access to credit pose an adverse implication of stunted growth in SMEs sector, which can consequently lead to poverty and unemployment

(Morewagae et al., 1995). Some of the common characteristics of informal sector credit include small loans, charged high interest rates and with short period of maturity that are unfavorable for long-term development of enterprises (Okurut, 2006).

1.2 Research Problem

Theoretically, a number of factors influence the loan volumes among banks. These factors include interest rates, bank size, credit risk, liquidity and volume of deposits. Others are age, credit history, size of the firm, collateral offered and risk profile (Mole & Namusonge, 2016). Athanasoglou, Brissimis and Delis (2005) classify factors that influence a bank's loan volumes as either emanating from inside or outside the bank. Factors found within the organization vary according to each bank and each determines the level of its lending. These factors accrue due to managerial decisions and they include liquidity, capital adequacy, volume of deposits, asset quality among others. Those extraneous to the bank include; interest rates, volatility of the exchange rates, inflation, economic growth, money supply among others.

The expectation of Kenyan financial sector is to be efficient in financial intermediations through making loanable funds easily accessible to borrowers and as result boosting investments, increasing productivity within all units of the economy and leading to jobs creation. Some part of the diamond wealth has been used by the government in creation a variety of credit development programmes. The government has recently made development of the financial institutions through providing subsidized credits, which comes coupled with monitoring, mentoring training and business advisory to selected entrepreneurs. Notwithstanding the initiatives, evidence shows that lenders are not operating at their maximum loan volumes, despite the main role played by the credit market in the fight against poverty through job opportunity creation. This denotes that

banks do not lend to all borrowers that can pay for the price of credit (Okurut & Bothole, 2005).

Several research studies have been done in this area on the international context. Abdirashid (2017) established that quality of management affect loan volumes of banks in Tunisia. This was centered on only one variable leaving a gap on other determinants of banks loan volumes. Agbeja, Adelokun and Olufemi (2015) who studied capital adequacy and loan volumes of commercial banks in Nigeria found a positive association between bank loan volumes and capital adequacy. Findings showed that higher levels of equity increased the chances of the banks to report higher loan volumes. This study did not address other firm specific factors that can influence performance.

Locally, most studies conducted have focused on individual determinants of loan volumes. Ngure (2018) focused on the influence of Interest Rate Capping (IRC) on loan volumes among microfinance banks in Kenya and concluded that IRC reduced loan volumes. Kimutai and Jagongo (2013) sought to examine the factors influencing credit rationing by banks in Kenya. It was determined from the study that three factors namely loan characteristics, observable characteristics and firm characteristics influence credit rationing. This study though related with the current study did not focus on loan volumes. The lack of consensus among previous researchers is reason enough to conduct further study. In addition, there are not many studies done in Kenya on determinants of loan volumes. This study's intent was to leverage on this gap by answering the research question; what are the determinants of loan volumes among commercial banks in Kenya?

1.3 Research Objective

The objective of this study was to establish the determinants of loan volumes among commercial banks in Kenya.

1.4 Value of the Study

The results of the research are critical to the future researchers, since it can be a point of reference. The findings might also be significant to scholars and researchers, in identifying the research gaps on the related topics of the study as well as reviewing of the empirical literature to institute further areas of research.

The stakeholders of the banking industry will find this research very useful as this study will generate vital information in management of the industry. These stakeholders include researchers, managers in the sector and the legislative authorities in the sector. The management of banks will derive the most out of this since it illuminates ways in which they can utilize determinants of loan volumes as a channel to improve performance in their banks.

To the government and other policy makers, the study will also be of importance as they may use its findings to generate effective policies to mitigate the impacts of determinants of loan volumes on performance of the banking sector.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A review of theories forming the foundation of this study will be presented in this section. In addition, previous researches carried out before on this research topic and related areas are also discussed. The other sections of this chapter include determinants of loan volumes, conceptual framework showing the relationship between variables of the study and a literature review summary.

2.2 Theoretical Framework

This presents review of the relevant theories that explains determinants of loan volumes. Theoretical reviews covered are loanable funds theory of interest rates, the theory adverse selection and the liquidity preference theory.

2.2.1 Loanable Funds Theory of Interest Rates

This theory was developed by Fry (1995) and it posits that in the loanable funds theory, there is an assumption that two market forces that is the demand for credit and supply of loanable funds are the determining factor for the interest to be charged. The concentration of this theory majorly is on how interest rates are determined and also focusses on explaining the interest rates in the long-term.

Loanable funds refer to the money invested or saved by both individual and organizations intending to lend it to the prospective borrowers. Using market forces of demand and supply, it explains rates of interest of existing loans. The supply of the loanable funds originates from various sources that instead of spending they opt to put the money as saving so that they invest it, the sources could be the government, other economic entities and individuals. Investors lending at a rate here one way of capitalizing. Demand for the loanable monies arises from business entities and

individuals that need funds to finance their business operations and also to invest in acquisition of assets that will appreciate in value for example buying land. As a result, borrower's choice to finance their investments through acquiring the credit facilities creates the demand for the loanable fund (Rocha, 1986).

As per the theory, determination of the spread of interest rates is founded on market forces of demand and supply of the loanable funds. Rates of interest are based on a level at which demand and supply for loanable equal. As per a study by Claeys and Vander (2008), loanable funds theory gives an explanation on the determining factors of the spread in interest rates since failure of individual to make saving with the lending institutions will consequently lead to inadequate loanable funds supply hence the lending institution will be unable to lend or advance the credit services to the prospecting borrowers. Consequently, the credit demands will rise to high levels above the loanable funds supply. The repercussion is that high demand for credit translates to banks charging more interest rates. This has a resultant effect of widened spread of interest rate spread. The assumption of this theory is that the loanable funds market has perfect competition in way that neither the borrowers nor the lender have the ability of determining the securities prices. Also, it has the assumption that there exist free mobility of the funds in the marketplace. The importance of the theory to this study as it explains how the prevailing interest rates in the market are determined and in essence how they relate to loan volumes.

2.2.2 Adverse Selection Theory

This theory was pioneered by Pagano and Jappelli (1993) who suggested that the first means of mitigating the agency problem is regulation by the law, IASs, IFRS and Securities Exchange rules requiring managers to fully disclose private information. The SEC and FASB outline the guidelines that need to be followed in the process of

mandatory disclosures. However, full disclosure is not guaranteed even with these regulations owing to the conflict between managers and shareholders. They argue that, corporate reporting directions are hence expected to furnish financial specialists with the base amount of data that aids in basic leadership (Auronen, 2003).

In addition, principals have to incur agency costs in order to mitigate on the conflict. These include; costs monitoring (borne by shareholders to follow up on managers and minimize the agents' divergent activities), connection costs (paid by managers for optimal contracts to warranty that there will be no detriment to the principal's interests culminating from their actions) and outstanding loss costs (stemming from the divergence of judgments of agents from judgments that would lead to maximization of the principal's wellbeing). Thus, the price of agency is the summary of these three costs (Bester, 1994; Bofondi & Gobbi, 2003). This hypothesis is applicable to the study since it relates to how highly a firm can charge interest rates that are non-favorable to borrowers concealed as lending risk. This contributes to reduced loan volumes since it triggers high interest rates. The theory also explains how credit risk can influence loan volumes.

2.2.3 Liquidity Preference Theory

This theory was formulated by Keynes (1936) and it laid a foundation for cash holding. In this theory, Keynes argues that holding all other factors constant, investors will have a preference for liquid investments as opposed to long-term investments and will seek a higher return for investments that will take more time to mature. Liquidity is the expediency of holding cash. An individual or firm will hold money for various reasons at a given time (Bitrus, 2011). Based on the theory, firms hold cash to enable them meet their transaction, precaution, speculative and compensation motives.

Bibow (2005) suggests that liquidity preference establishes the balance of assets and liabilities that an entity can hold. Therefore, a bank's decision problem will therefore be on how to balance returns and liquidity, consequently growing profitability (Dafermos, 2009). The importance of this theory is that it will enable the bank to balance holding short term loans and long term loans and hold more of short term securities that are more liquid. Since short term investments are more liquid, a bank can easily convert them into cash, which can then be used to cushion the bank against operational risk that can arise. This also explains the theoretically expected relationship between liquidity and loan volumes.

2.3 Determinants of Loan Volumes

Theoretically, several factors influence bank loan volumes. These factors include interest rates, bank size, credit risk, liquidity as well as volume of deposits. Other factors include characteristics of a firm such as risk profile, earnings and business experience and loan characteristics like loan maturity, amount demanded, interest rate and collateral offered (Lapar & Graham, 1988). This section reviews some of these determinants.

2.3.1 Interest Rates

This is considered as an outlay of funds and an upward or downward movement in interest rate could influence the savings choice of the financiers (Olweny & Omondi, 2010). According to Rehman, Sidek and Fauziah (2009), the use of an interest cap causes banks to decrease loans. This in turn will lead to slowed growth of the banks. The banks can mitigate this situation by skyrocketing fees and other levies to arrest the situation. Barnor (2014) stated that unexpected variations in interest rates has an impact in investment decisions; hence investors tend to adjust their savings arrangements from capital market to fixed profits securities.

According to Khan and Sattar (2014), interest rate affects performance either positively or negatively depending on its movement. A decrease in interest rate to the depositors and an increase in spread discourage savings. An increasing interest rate to the investor adversely affects the investment. The banking sector is the most sensitive to movements in interest rates in comparison to other sectors because the largest proportion of banks' revenue comes from the differences in the interest rates that banks charge and pay to depositors. Diaz Alejandro and Carlos, (1984) observes that banks will not lend funds to all the customers that borrow at the prevailing interest rates because as much as the borrowers promise to make repayments in the future, they might not be truthful or wholly sincere. They state that lenders will always end up lending less even though borrowers might be willing to pay higher interest rates, as there exists no possible way of coming up with a system that can ascertain the real intentions of borrowers.

2.3.2 Bank Size

Bank size determines the extent to which a firm is affected by legal and financial factors. The size of the bank is also closely linked with the capital adequacy because large banks raise less expensive capital and thus generate huge profits. Bank size is positively correlated to returns on assets indicating that large banks can achieve economies of scales that reduce operational costs and hence help banks to increase loan volumes (Amato & Burson, 2007). Magweva and Marime (2016) link bank size to loan volumes claiming that they are positively related to each other suggesting that as the size increases, loan volumes increases.

According to Amato and Burson (2007), the size of an organization is primarily determined by the amount of assets it owns. An argument can be made that the larger the assets a firm owns, the more its ability to undertake a large number of projects with greater returns in comparison with small firms with a smaller amount of assets.

Additionally, the bigger the firm, the larger the amount of collateral that can be pledged in a move to access credit facilities in comparison to their smaller competitors (Njoroge, 2014). Lee (2009) concluded that the amount of assets in control by a bank has an influence on the level of loan volumes by the bank.

2.3.3 Credit Risk

This is the risk that firms face when customers fail to honor the debt obligations at maturity or due date. Banks are highly exposed to credit risk because the main purpose of bank existence is to grant credit facilities (Kapaya & Raphael, 2016). Thus credit management remains critical to lending and survival of banks and failure to manage it may lead to financial distress. Magweva and Marime (2016) proposed that credit risk negatively affects the loan volumes both in short and long run by reducing available funds for lending. SME's provide no or less collateral hence they are considered riskier. Thus, banks may resort to reduce credit availed to them to reduce the risk (Malede, 2014).

According to Laidroo (2012) liquidity and funding activity measures are highly correlated as included in the model. Banks are likely to increase credit to a borrower at better terms and favorable interest rates when solid collateral is provided, which reduces the risk of non-performing loans (Wisdom, 1997). Rationally, excess credit demand would make banks increase the requirement of collateral, resulting to more liability of the borrowers in case of project failure. Consequently, the risk for losses and demand for funds to the bank reduces, making the returns for the bank to rise.

2.3.4 Bank Liquidity

Liquidity is defined as the degree in which an entity is able to honor debt obligations falling due in the next twelve months through cash or cash equivalents for example

assets that are short term can be quickly converted into cash. Liquidity results from the managers' ability to fulfill their commitments that fall due to creditors without having to liquidate financial assets (Adam & Buckle, 2003).

According to Liargovas and Skandalis (2008), liquid assets can be used by firms for purposes of financing their activities and investments in instances where the external finance is not forthcoming. Firms with higher liquidity are able to handle unexpected or unforeseen contingencies as well as cope with its obligations that fall. Almajali et al. (2012) noted that bank's liquidity may have high impact on the amount of credit they extend to customers; therefore banks should aim at increasing their liquid assets while decreasing their short term obligations as per his recommendation. However, Jovanovic (1982) noted that an abundance of liquidity among banks may at times result to more harm.

2.3.5 Volume of Deposits

According to Kamande (2017), the volume of deposits directly affects bank's loan volume decision by determining its ability to expand to risky areas. The higher the volume of deposits, the lower the risk and the higher the profitability due to ability to absorb losses and minimize risk exposure. However, over reliance on the volume of deposits might reduce bank profitability by reducing the need for other cheaper sources of capital, leading to slowed lending levels.

Banks therefore need to ensure they maintain a quality portfolio of these assets as it determines their loan volumes (Dang, 2011). According to Athanasoglou et al. (2005), volume of deposits is a significant variable in determining bank loan volumes as banks are only able to lend out of what they have and therefore a bank with more deposits have more ability to lend compared to a bank with less deposits.

2.4 Empirical Review

Several local and international studies support the relationship between loan volumes and its determinants. Some of these studies are discussed in this section.

2.4.1 Global Studies

Ahiawodzi and Sackey (2013) investigated some commercial banks in Ghana loan volumes. The study looked at the effect of selected variables on the loan amount realized during the time of liberal interest rates. Random dependent variable was the loan amount realized and the exogenous variables were collateral value, net profits, business experience, age, gender, credit purpose and interest rates. All the exogenous variables are important in explaining the dependent variable. The findings suggested that despite having liberal interest rates as a method of allocating credit, credit will still be rationed. This is because; the other factors mentioned above are key determinants of allocation of credit as there exists moral hazard risk and adverse selection.

Kanwal and Nadeem (2013) also in a research study sought to establish the existing relationship between macroeconomic variables (GDP, inflation rate, interest rate) and lending levels of public commercial banks in Pakistan. The study covered a period 2001-2011 (ten years). Population comprised thirty-eight banks; a sample of twenty three listed banks was studied. Data was sourced from secondary sources and analysed using correlation analysis, descriptive statistics as well as pooled ordinary least squares regression analysis. The researchers find a strong positive association between lending levels and interest rate, an insignificant positive association between GDP and lending levels and a weak negative relationship between inflation rate and bank lending levels. In summary the study concludes that there exists a weak association between macroeconomic variables and commercial banks' lending levels.

Agbeja, Adedokun and Olufemi (2015) studied how capital adequacy and loan volumes of banks in Nigeria relate. The study used a descriptive design and a multiple regression model was used in analysis. The study revealed a positive association between bank loan volumes and capital adequacy. The results showed that a larger equity increased the chances of the banks to report better loan volumes. This study did not address other firm specific factors that can influence loan volumes.

Chaabouni and Selmi (2016) aimed at explaining the determinants of credit rationing in Tunisia. The study focus was on the information factor between firms and banks, given limitation of lenders and borrowers contracts despite existence of legal rules and proper application. The study was restricted to the case of SMEs because of their role in industrial network. A survey was used to analyze the behavior of the credit managers who dealt with the loan applications of SMEs. The conclusion of the findings revealed that credit managers in Tunisia are risk averse, and that makes them ration credit. It was also found that inefficient recovery procedures, accounting documents reliability and the risk of adverse selection are some of the determinants of this rationing.

Mazlan, Ahmad and Jaafar (2016) examined factors affecting credit levels and profitability for Indian banks. The study employed panel data method of analysis between 1997 and 2009 and the research findings revealed an inference contrary to the established and expected outcome. The study found out that interest rates had no significant influence on credit levels of commercial banks and further that asset size of the bank has insignificant effect on level of commercial banks profitability.

2.4.2 Local Studies

Kimutai and Jagongo (2013) sought to examine why commercial banks in Kenya practice credit rationing. Commercial banks located within Nairobi were the population

targeted and where the sample was derived. Primary data and secondary data were used and descriptive research design was employed for the study. The findings revealed three main factors that influenced credit rationing and they include loan, firm and observable characteristics. The study recommended that banks should ration credit but with a level of professionalism to avoid being biased. Thorough evaluation should be done by the person in charge of credit before rationing and finally recommended banks to investigate on how credit rationing contributes to their business growth.

Auma and Muturi (2017) examined factors hindering the effectiveness of bank credit in enhancing the performance of SMEs in Kenya in terms of terms of credit, utilization of loan and managerial competencies. Descriptive survey design was used. The study targeted 1527 SMEs within Kisumu city from which 316 were sampled using proportionate sampling. Findings revealed that the three factors cumulatively accounted for 24% of the variance in SME performance. Credit terms was the most significant accounting for 31.1% of the variance, Loan utilization challenges 28.8% while managerial competence contributed 24.4% of the variance in performance for a majority of SMES.

Chirchir and Maina (2017) undertook a research study on the role played by credit rationing on financial accessibility by SMEs. The target population was SMEs located in Eldama Ravine Sub-County, in Baringo County. The research design used was cross-sectional survey and stratified random sampling method was applied to derive a sample of respondents from the accessible population. This study used a self-administered semi-structured questionnaire to collect data. Conclusions from the findings were that firms with good credit history, older and large enterprises are not denied loans. The respondents further agreed that risky ventures are credit rationed by banks. In most cases firms that offer highly valued collaterals are not credit rationed. The results

indicated with reduced credit rationing, financial institutions will ensure financial services are accessible to SME's.

Ngure (2018) studied how interest rate capping influenced credit growth among micro finance banks in Kenya. The selected population was 11 microfinance institutions allowed to engage in deposit taking by the CBK. Analysis of data was made using descriptive analysis, correlation analysis and logit regression analysis. Logit results showed that there existed a significant difference on the effect of asset quality on credit growth of MFI banks in Kenya resulting from interest rate capping. Logit results also indicated a strong correlation between credit growth and liquidity. The result further showed that a substantial difference exists on the effect of liquidity on credit growth of microfinance banks resulting from interest rate capping. The model results also showed that there is a significant difference on how capital adequacy influences credit growth of microfinance banks resulting from interest rate capping.

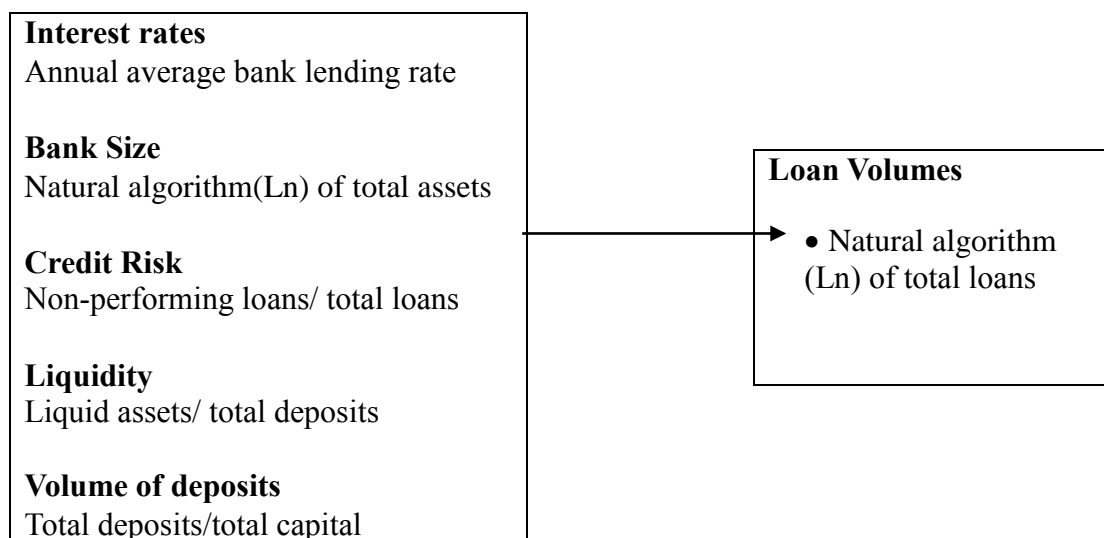
2.5 Conceptual Framework

The conceptual model developed below portrays the expected association existing between the variables. The independent variables are interest rates, bank size, credit risk, liquidity and volume of deposits. Loan volume was the dependent variable that formed the scope of the study and it was given by the natural logarithm of total loans granted in a given year.

Figure 2.1: The Conceptual Model

Predictor variables

Response variable



Source: Researcher (2019)

2.6 Summary of the Literature Review

A number of theories have explained the theoretically expected relationship between loan volumes and its determinants. Theories covered in this review are; loanable funds theory, adverse selection theory and liquidity preference theory. Some of primary influencers of loan volumes have also been explored in this chapter. A number of local and international empirical studies exist on determinants of loan volumes. The findings of these studies have also been explored in this section.

Kimutai and Jagongo (2013) sought to examine why commercial banks in Kenya practice credit rationing. The main factors influencing credit rationing were established and they include loan characteristics, firm characteristics and observable characteristics. Chirchir and Maina (2017) undertook a research study on the role played by credit rationing on financial accessibility by SMEs. The study concluded that: firms with good credit history, older and larger enterprises are not denied loans.

Although the local studies conducted are related to the current study, they have not specifically focused on determinants of loan volumes among commercial banks in Kenya. The current study sought to leverage on this research gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

To ascertain determinants of loan volumes by commercial banks in Kenya, a research methodology was necessary to outline how the research was carried out. This chapter has five sections which explain the research design adopted, the population of the study, data collection method, the diagnostic test and the test of significance.

3.2 Research Design

Descriptive cross sectional research design was embraced in this study. The design was utilized as the researcher is interested in finding out the state of affairs as they exist (Khan, 2008). The fact that the researcher of this study has insight on the area under examination but seeks more knowledge regarding the relationship between the variable being studied make this research design suitable. In addition, a descriptive research aims at providing a valid and accurate representation of the study variables and this helps in responding to the research question (Cooper & Schindler, 2008).

3.3 Population

A population is the totality of observations of interest from a collection such as persons or events as specified by a research investigator (Burns & Burns, 2008). Population for this study included all the 43 commercial banks that are in operation during the study period (See Appendix I). Since the study is relatively small, sampling was not conducted.

3.4 Data Collection

This study relied on secondary data. The source of the secondary data was the published annual financial reports published by banks operating in Kenya between January 2014 and December 2018 and captured in a data collection form. The end result was annual

information on the predictor variables and the response variable for the 43 commercial banks in Kenya.

3.5 Diagnostic Tests

The assumption of linearity states that an association between two variables X and Y can be illustrated using an equation $Y=Bx$ with c as a constant factor. The linearity test was obtained through the scatterplot testing or F-statistic in ANOVA. Stationarity test is a process where the statistical properties such as mean, variance and autocorrelation structure do not change with time. Stationarity was obtained from the run sequence plot. Normality tests the presumption that the residual of the response variable has a normal distribution around the mean. The test for normality was done by the Shapiro-wilk test or Kolmogorov-Smirnov test. Autocorrelation measures how similar a certain time series is in comparison to a lagged value of the same time series in between successive intervals of time. This was measured by the Durbin-Watson statistic (Khan, 2008).

Multicollinearity occurs when an exact or near exact relation that is linear is observed between two or several predictor variables. The determinant of correlation matrices were used as a test for Multicollinearity which ranges from zero to one. Orthogonal predictor variable indicates that for a complete linear dependence to be ascertained between the variables, the determinant should remain one while it is at zero and Multicollinearity increases as it moves closer to zero. Variance Inflation Factors (VIF) and the levels of tolerance were determined to show how strong Multicollinearity was (Burns & Burns, 2008).

3.6 Data Analysis

The SPSS software version 22 was used in the analysis of the data. The researcher quantitatively presented the findings using graphs and tables. Descriptive statistics were

employed for summarizing and explaining the study variables observed in banks. The results were presented by use of percentages, frequencies, measures of central tendencies and dispersion displayed in tables. Inferential statistics included Pearson correlation, multiple regressions, ANOVA and coefficient of determination.

3.6.1 Analytical Model

The regression model below was used:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon.$$

Where: Y = Loan volumes measured as natural logarithm of total loans in a given year

β_0 = Constant

β_1 - β_5 = Regression coefficients

X_1 = Interest rate-annual average bank lending rate

X_2 = Bank size measured using natural algorithm of total assets

X_3 = Credit risk= $\frac{\text{Non-performing loans}}{\text{Total Loans}}$

X_4 = Liquidity ratio= $\frac{\text{Liquid Assets}}{\text{Total deposits}}$

X_5 = Volume of deposits= $\frac{\text{Total deposits}}{\text{Total capital}}$

ε =error term

3.6.2 Tests of Significance

Parametric tests were carried out by the researcher to establish the statistical significance of both the overall model and individual parameters. The F-test was used in the determination of the significance of the overall model and it was obtained from Analysis of Variance (ANOVA) while a t-test established statistical significance of individual variables.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section details the analysis, findings and elucidation of the secondary data obtained from the CBK and individual banks websites. The aim of the study was establishing the determinants of loan volumes among commercial banks in Kenya. The independent variables for the study were interest rates, bank size, credit risk, liquidity and volume of deposits while the dependent variable was loan volumes measured by the natural logarithm of total loans in a given year. Regression analysis was adopted to determine the effect between the variables of study in relation to the study's objectives. In ascertaining the suitability of the analytical model, ANOVA was applied. The results were presented in tables.

4.2 Descriptive Analysis

The statistics produces a representation of the mean, minimum and maximum values of variables presented including the standard deviations. Table 4.1 displays the qualities of each variable. An output of each variable was extracted using SPSS software for a five-year time frame (2014 to 2018) on an annual basis.

Table 4.1: Descriptive Statistics

	Units	N	Minimum	Maximum	Mean	Std. Deviation
Loan volumes	Ln	190	12.565	19.938	16.97408	1.504822
Interest rate	%	190	8.500	10.750	9.74160	.768728
Bank size	Ln	190	14.775	20.387	17.68218	1.355060
Credit risk	Ratio	190	.000	.720	.10973	.109624
Liquidity	Ratio	190	.045	1.743	.82468	.248846
Volume of deposits	Ratio	190	.419	28.804	4.94026	3.380352
Valid N (listwise)		190				

Source: Research Findings (2019)

4.3 Diagnostic Tests

The data collected was subjected to diagnostic tests. The study presumed a significance level of 5% or 95% confidence interval so as to make variable deductions on the data adopted. Diagnostic tests were useful for ascertaining the falsity or truth of the data. Therefore, the nearer to 100% the confidence interval, the more accurate the data used is presumed to be. In this case, the tests conducted were Multicollinearity test, normality test and autocorrelation tests.

4.3.1 Multicollinearity Test

This can be defined as a statistical state where more than one predictor variables are highly correlated in a multiple regression model. It is an unwanted situation for independent variables to have a strong correlation. A combination of variables is said to exhibit high Multicollinearity in case there is one or more exact linear correlation among the study variables as shown in Table 4.2.

Table 4.2: Multicollinearity Test

Variable	Collinearity Statistics	
	Tolerance	VIF
Interest rates	0.366	2.732
Bank size	0.398	2.513
Liquidity	0.388	2.577
Credit risk	0.368	2.717
Volume of deposits	0.376	2.659

Source: Research Findings (2019)

From Table 4.2, it is clear that VIF value and Tolerance of the variable were utilized where the values below 10 for VIF and values more than 0.2 for Tolerance imply no Multicollinearity. From the results, all the variables had a VIF values <10 and tolerance values >0.2 as illustrated in table 4.2 suggesting that no Multicollinearity.

4.3.2 Normality Test

Shapiro-wilk test and Kolmogorov-Smirnov test was utilized for normality testing. The level of significance in the study was 5%. The outputs of the test are depicted in Table 4.3. The null hypothesis is that the data is distributed normally. If the Shapiro-wilk test and Kolmogorov-Smirnov tests contradict, the later test is picked over the former because it is more statistically sound. Since the p value in both tests of all the variables is greater than the α (0.05), then the null hypothesis is not rejected. Hence the data series of all the variables is normally distributed as shown in Table 4.3.

Table 4.3: Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Loan volumes						
Interest rate	.173	190	.264	.918	190	.822
Bank size	.180	190	.264	.894	190	.790
Liquidity	.176	190	.264	.892	190	.784
Credit risk	.178	190	.264	.893	190	.787
Volume of deposit	.181	190	.264	.896	190	.792

a. Lilliefors Significance Correction

Source: Research Findings (2019)

4.3.3 Autocorrelation Test

To test for autocorrelation, Durbin-Watson statistic was applied which gave an output of 1.924 as displayed in Table 4.4. The Durbin-Watson statistic ranges from point 0 and point 4. If there exists no correlation between variables, a value of 2 is shown. If the values fall under point 0 up to a point less than 2, this is an indication of an autocorrelation and on the contrast a negative autocorrelation exist if the value falls under point more than 2 up to 4. As a common rule in statistics, value falling under the range 1.5 to 2.5 are considered relatively normal whereas values that fall out of the range raise a concern. Field (2009) however, opines that values above 3 and less than 1 are a sure reason for concern. Therefore, the data used in this panel is not serially auto correlated since it meets this threshold as shown in Table 4.4.

Table 4.4: Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.911 ^a	.830	.826	.628279	1.924

a. Predictors: (Constant), Bank size, Interest rate , Volume of deposits, Liquidity, Credit risk
b. Dependent Variable: Loan volumes

Source: Research Findings (2019)

4.4 Correlation Analysis

This analysis establishes whether there exists an association among two variables. The association falls between a perfect positive and a strong negative correlation. This study utilized Pearson correlation to analyze the level of association between loan volumes and its determinants. The study employed a confidence interval of 95%, as it is the most utilized in social sciences. A two tailed test was utilized. Table 4.5 shows the correlation analysis outcome.

Existence of a positive and statistically substantial correlation ($r = .889$, $p = .000$) between bank size and loan volumes was revealed. Credit risk was also noted to have a negative and significant association with loan volumes as evidenced by ($r = -.266$, $p = .000$). Interest rates, liquidity and volume of exhibited a positive relationship with loan volumes but the association was not statistically significant as evidenced by p values above 0.05. The study further found that although there was an association between the independent variables, it was not strong enough to result to Multicollinearity. In statistics, Multicollinearity is a situation where there is existence of a perfect relationship between the predictor variables. Existence of an exact or a perfect among the predictor variables makes it challenging to derive dependable estimations of individual coefficients. Thus, it leads to improper conclusions of the relationships among the independent and the dependent variables as shown in Table 4.5.

Table 4.5: Correlation Analysis

		Loan volumes	Interest rate	Bank size	Credit risk	Liquidity	Volume of deposits
Loan volumes	Pearson Correlation	1					
	Sig. (2-tailed)						
Interest rate	Pearson Correlation	.032	1				
	Sig. (2-tailed)	.665					
Bank size	Pearson Correlation	.889**	.025	1			
	Sig. (2-tailed)	.000	.732				
Credit risk	Pearson Correlation	-.266**	.037	-.289**	1		
	Sig. (2-tailed)	.000	.615	.000			
Liquidity	Pearson Correlation	.096	.163*	-.080	-.059	1	
	Sig. (2-tailed)	.189	.025	.272	.422		
Volume of deposits	Pearson Correlation	.133	-.066	.066	.280**	-.187**	1
	Sig. (2-tailed)	.068	.363	.367	.000	.010	

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).
c. Listwise N=190

Source: Research Findings (2019)

4.5 Regression Analysis

At significance level of 5% a regression analysis was accomplished between loan volumes and the five predictor variables selected for this study. The F critical value was compared against the F calculated.

Table 4.6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.911 ^a	.830	.826	.628279	1.924

a. Predictors: (Constant), Bank size, Interest rate , Volume of deposits, Liquidity, Credit risk
b. Dependent Variable: Loan volumes

Source: Research Findings (2019)

From table 4.6, it is clear that the R-square value was 0.830, implying that 83 % of the deviations in loan volumes among commercial banks is caused by changes in interest rates, bank size, credit risk, liquidity and volume of deposits. Other factors not incorporated in the model are attributed 17% of the changes in loan volumes. The correlation coefficient (R) value of 0.911 shows there exist a strong relationship between the independent variables included in the study and loan volumes as shown in Table 4.6.

Table 4.7 provides the outcomes of the ANOVA; the essence of F-test was to establish how significant the model was. The formulae for calculating the critical value for the F test is;

$$F = (SSE_1 - SSE_2 / m) / SSE_2 / n-k$$

Where;

SSE = Residual sum of squares,

m = Number of restrictions

k = Number of independent variables.

Table 4.7: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	355.358	5	71.072	180.049	.000 ^b
	Residual	72.631	184	.395		
	Total	427.989	189			

a. Dependent Variable: Loan volumes

b. Predictors: (Constant), Bank size, Interest rate , Volume of deposits, Liquidity, Credit risk

Source: Research Findings (2019)

A critical value of 2.46 was obtained from the F-Test tables. The F statistic indicated in the study findings is more than the critical value, thus the whole model is significant to predict loan volumes.

So as to ascertain the significance of each variable individually variable in this research as a predictor of the loan volumes among banks it was important for t-test to be employed. P-value was utilized to indicate how significant the relationship between the response and the predictor variables was. Confidence level at 95% and value of p below 0.05 was understood as an index of statistical significance of the concepts. Therefore, a p-value more than 0.05 depicts an insignificant variable. The outcomes are demonstrated in table 4.8.

Table 4.8: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.378	.857		-1.608	.109
	Interest rate	.025	.061	.013	.405	.686
	Credit risk	-.410	.460	-.030	-.891	.374
	Liquidity	1.144	.190	.189	6.025	.000
	Volume of deposits	.052	.014	.117	3.602	.000
	Bank size	.986	.036	.888	27.491	.000

a. Dependent Variable: Loan volumes

Source: Research Findings (2019)

The coefficients are used as an indicator of the magnitude and direction of the relation between the predictors and the response variable. The T values were applied to establish the significance of the relationship of the predictor variable to the response variable. The values obtained are contrasted to the critical values. A confidence interval of 95% and a two tailed T test critical value of ± 2.04523 was obtained from the T test tables. A T test value that lies out of this range is significant.

The results revealed that bank size, liquidity and volume of deposits have positive and significant influence on loan volumes. Implication of this is that a unit increment in bank size, liquidity or volume of deposits will result to an increase in the loan volumes by 0.986, 1.144 and 0.052 respectively. Credit risk exhibited a negative but not statistically significant influence on loan volumes implying that an increase in credit risk would not significantly decrease loan volumes. The findings further revealed that although interest rates had a positive influence on loan volumes, the influence was not statistically significant. The constant coefficient -1.378 implies that when the five selected independent variable have a zero value, loan volumes among banks would be equal to the figure.

The regression equation below was thus estimated:

$$Y_i = -1.378 + 0.986X_1 + 1.144X_2 + 0.052X_3$$

Where;

Y_i = Loan volumes

X_1 = Bank size

X_2 = Liquidity

X_3 = Volume of deposits

4.6 Discussion of Research Findings

The researcher was seeking to assess the determinants of loan volumes among commercial banks in Kenya. Interest rates, bank size, credit risk, liquidity and volume of deposits were the predictor variables in this study while loan volumes measured by natural logarithm of total loans in a given year was the dependent variable. The adequacy of the overall model in predicting loan volumes was examined. The influence of each predictor variable on the dependent variable was also examined with respect to strength and direction.

From the results of Pearson correlation, a positive and statistically notable correlation between bank size and loan volumes was observed. Credit risk was noted to have a negative and significant association with loan volumes. Interest rate, liquidity and volume of deposits were however found to have a positive but insignificant link with loan volumes.

The independent variables from the model summary revealed that: interest rates, bank size, credit risk, liquidity and volume of deposits explains 83% of variations in the response variable as shown by R square which derives an implication that other factors not considered in the model explain the 13% of variations in loan volumes. The model was fit at 95% confidence level because the F-value is 180.049. This signifies that the model adopted is appropriate for predicting and explaining how the independent variables affect commercial banks' loan volumes. This implies that interest rates, bank size, credit risk, liquidity and volume of deposits are good predictors of loan volumes.

This study agrees with Mazlan, Ahmad and Jaafar (2016) who examined factors affecting credit levels and profitability for Indian banks. The study employed panel data method of analysis between 1997 and 2009 and the research findings revealed an

inference contrary to the established and expected outcome. The study found out that interest rates had no significant influence on credit levels of commercial banks and further that asset size of the bank has insignificant effect on level of commercial banks profitability.

The study findings differ with that conducted by Ahiawodzi and Sackey (2013) who investigated some commercial banks in Ghana loan volumes behavior. The study looked at the effect of selected variables on the loan amount realized during the time of liberal interest rates. Random dependent variable was the loan amount realized and the exogenous variables were collateral value, net profits, business experience, age, gender, credit purpose and interest rates. All the exogenous variables are important in explaining the dependent variable. The findings suggested that despite having liberal interest rates as a method of allocating credit, credit will still be rationed. This is because; the other factors mentioned above are key determinants of allocation of credit as there exists moral hazard risk and adverse selection.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main goal of the study was establishing determinants of loan volumes among commercial banks in Kenya. This chapter gives an overview of the results from the previous chapter, conclusion, limitations encountered during the study. Moreover, it recommends policies that policy makers can use. Additionally, the chapter gives recommendations for future researchers.

5.2 Summary of Findings

The aim of the research was to ascertain factors influencing loan volumes among commercial banks in Kenya. To conduct the study, interest rates was given by the annual average bank lending rate, credit risk given by ratio of non-performing loans to total loans in an year, liquidity as measured liquid assets divided by customer deposits, bank size given as the natural log of total assets and volume of deposits measured as the quotient of total deposits and total capital. Loan volumes was the response variable that formed the scope of the study and it was be given by the natural logarithm of total loans. The researcher reviewed available theoretical foundations and empirical reviews to get an understanding on the generally accepted relationship among the selected dependent and independent variables. From this review, a conceptual framework was developed that hypothesized the expected association between the study variables.

Descriptive research design was employed. All the 43 commercial banks as at December 2018-year end comprised the population of this study and from this, data was obtained from 38 banks giving a response rate of 88.37%. Data secondary in nature was acquired from CBK and individual banks financial reports for a time frame 5 years

spanning 2014 to 2018 was used. The researcher carried out descriptive, correlation analysis as well as regression analysis. So as to confirm that the data is fit for analysis the researcher transformed the data and conducted diagnostic tests to make sure that the data has the required characteristics before conducting inferential statistics. Regression analysis was applied in testing the strength of the association between the study variables and to test both the significance of the overall model and individual parameters. SPSS software version 22 was used to carry out the analysis.

Pearson correlation showed that a positive and statistically notable correlation between bank size and loan volumes exists. Further, credit risk was noted to have a negative and significant association with loan volumes. Interest rate, liquidity and volume of deposits were however found to have a positive but insignificant link with loan volumes.

The coefficient of determination also called R square shows the disparities in the response variable triggered by variations from the predictor variable. From the results, R square was found to be 0.830, a revelation that 83% of the changes in loan volumes stems from variations in interest rates, bank size, credit risk, liquidity and volume of deposits. Alternative factors beyond those in the model justify for 17% of these changes in loan volumes. The findings showed a strong correlation between the chosen variables and the loan volumes of banks ($R=0.911$). Results from the ANOVA test showed that the F statistic was at significance level of 5% and a $p=0.000$ rendering the model appropriate for providing an explanation of the relation between the variables studied.

The study further found that bank size, liquidity and volume of deposits have positive and significant influence on loan volumes. Implication of this is that a unit increment in bank size, liquidity or volume of deposits will result to an increase in the loan volumes by 0.986, 1.144 and 0.052 respectively. Credit risk exhibited a negative but

not statistically significant influence on loan volumes implying that an increase in credit risk would not significantly decrease loan volumes. The findings further revealed that although interest rates had a positive influence on loan volumes, the influence was not statistically significant. The constant coefficient -1.378 implies that when the five selected independent variable have a zero value, loan volumes among banks would be equal to the figure.

5.3 Conclusion

The findings of this study show that the loan volumes among Kenyan banks are notably impacted by bank size, liquidity and volume of deposits. This research shows that an increment in a unit in these variables significantly increases the loans granted by commercial banks in Kenya. The study further revealed that credit risk has a negative non-significant effect on loan volumes among banks. This study therefore concludes that banks with high credit risk do not on average grant less credit compared to banks with less credit risk. The study also showed that interest rates were statistically insignificant in determining loan volumes and hence the study concluded that interest rates do not have a profound effect on loan volumes.

The conclusion of this study is that the independent variables selected for this study (interest rates, bank size, credit risk, liquidity and volume of deposits) to a larger extent have a notable influence on loan volumes among banks in Kenya. The conclusion is that these variables have a notable impact on the loan volumes among banks given the p value in anova summary. The finding that 83% of the variations in the response variable are from the five factors listed implies that the 17% variations result from other factors outside the model.

This study agrees with Mazlan, Ahmad and Jaafar (2016) who examined factors affecting credit levels and profitability for Indian banks. The study employed panel data method of analysis between 1997 and 2009 and the research findings revealed an inference contrary to the established and expected outcome. The study found out that interest rates had no significant influence on credit levels of commercial banks and further that asset size of the bank has insignificant effect on level of commercial banks profitability.

The study findings differ with that conducted by Ahiawodzi and Sackey (2013) who investigated some commercial banks in Ghana loan volumes behavior. The study looked at the effect of selected variables on the loan amount realized during the time of liberal interest rates. Random dependent variable was the loan amount realized and the exogenous variables were collateral value, net profits, business experience, age, gender, credit purpose and interest rates. All the exogenous variables are important in explaining the dependent variable. The findings suggested that despite having liberal interest rates as a method of allocating credit, credit will still be rationed. This is because; the other factors mentioned above are key determinants of allocation of credit as there exists moral hazard risk and adverse selection.

5.4 Recommendations of the Study

Leveraging on the study findings, below recommendations has been drawn. The study recognized that there exists a positive and significant influence of liquidity on loan volumes among banks. Thus, the study findings were that an increase in a bank's liquidity will significantly influence loan volumes. This study therefore recommends that a comprehensive assessment of banks' immediate liquidity position should be

undertaken to ensure the banks are operating at sufficient levels of liquidity that will lead to improved loan provision by commercial banks.

The study showed that volume of deposits has a positive influence on loan volumes. This implies that a bank with higher volume of deposits is likely to extend more credit compared to a bank with less volume of deposits. A recommendation is that banks' management and directors should focus on increasing their volume of deposits by formulating measures and policies centered on enlarging the banks' deposits since this has a direct impact on how they avail credit to borrowers.

The study showed that loan volumes showed a positive and significant response with the size of the bank. A recommendation is that banks' management and directors should focus on increasing their asset base by formulating measures and policies centered on enlarging the banks' assets since this has a direct impact on how they issue loans. The results of the study show that the larger the bank (in terms of asset base), the higher the expectation of higher loan volumes in comparison to smaller banks and hence more focus should be on growing their asset base.

5.5 Limitations of the Study

The study was confronted with limitations including; the data used was secondary in nature and the researcher is not aware of its authenticity and reliability based on its collection and storage and alterations that might have been done on it.

The study adopted the analytical approach which is highly scientific. The research also disregarded qualitative information which could explain other factors that influence loan volumes among commercial banks. The study should have rather considered utilizing focus group discussions, open ended questionnaires or interviews so as to come up with more concrete results.

The research concentrated on 5 years (2014 to 2018). It is not certain whether the findings would hold for a longer time frame. It is also unclear as to whether similar outcomes would be obtained beyond 2019. The study should have been executed over a longer time frame in order to incorporate major forces such as booms and recession.

5.6 Suggestions for Further Research

A suggestion is given that more research ought to include a qualitative analysis on determinants of loan volumes among commercial banks in Kenya. That study would deal with interviewing of vital respondents in the banks and this would reveal concealed insights into the fine detailed relationship between loan volumes and its determinants.

The study did not exhaust all the independent variables influencing loan volumes among Kenyan commercial banks and a recommendation is given that more studies be carried out to constitute other variables for instance borrower characteristics, regulatory framework, information asymmetry, age of the bank among others. Determining the impact of each variable on loan volumes shall enable the policy makers to understand the tools that can be used to control credit supply.

The research only focused on the commercial banks. The study's recommendations are that further studies be carried out on other financial institutions in Kenya. Finally, as a result of regression models' limitations, other models including the VECM model may be applied in explanation of the various relationships among variables.

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APPENDICES

Appendix I: Commercial Banks in Kenya

1. Africa Banking Corporation Ltd
2. Bank of Africa Kenya
3. Bank of Baroda(K) Ltd
4. Bank of India
5. Barclays Bank of Kenya Ltd
6. Citibank N.A. Kenya
7. Commercial Bank of Africa Ltd
8. Consolidated Bank of Kenya Ltd
9. Co-operative Bank of Kenya
10. Credit Bank Ltd
11. Development Bank of Kenya Ltd
12. Diamond Trust Bank Kenya Ltd
13. DIB Bank Kenya Ltd
14. Ecobank Kenya Ltd
15. Equity Bank Ltd
16. Family Bank Ltd
17. First Community Bank Limited
18. Guaranty Trust Bank Limited
19. Guardian Bank Limited
20. Gulf African Bank Limited
21. Habib Bank A.G Zurich
22. Housing Finance Company Ltd
23. I& M Bank Limited
24. Jamii Bora Bank
25. Kenya Commercial Bank Ltd
26. Middle East Bank (K) Ltd
27. Mayfair Bank Ltd
28. M- Oriental Bank Limited
29. National Bank of Kenya Ltd
30. NIC Bank PLC
31. Paramount Bank Ltd

32. Prime Bank Limited
33. SBM Bank
34. Sidian Bank Ltd
35. Stanbic Bank Kenya Ltd
36. Standard Chartered Bank (K) Ltd
37. Spire Bank Ltd
38. Transnational Bank Ltd
39. UBA Bank Kenya Ltd
40. Victoria Commercial Bank Ltd
41. Chase Bank Kenya Ltd **
42. Charterhouse Bank Ltd **
43. Imperial Bank Ltd **

Source: CBK (2019)

Appendix II: Research Data

Bank	Year	Loan volume s	Interest rate	Credit risk	Liquidity	Volume of deposits	Bank size
Units		Ln	%	Ratio	Ratio	Ratio	Ln
ABC Bank	2014	16.431	8.500	0.051	0.851	5.456	16.910
	2015	16.543	10.125	0.143	0.968	5.247	16.934
	2016	16.499	10.750	0.157	0.875	5.909	16.945
	2017	16.582	10.000	0.183	0.764	6.941	17.058
	2018	16.694	9.333	0.199	0.786	6.328	17.145
Bank of Africa	2014	17.652	8.500	0.047	0.878	6.409	18.160
	2015	17.448	10.125	0.232	0.796	5.489	18.054
	2016	17.267	10.750	0.261	0.915	4.513	17.841
	2017	17.126	10.000	0.282	0.868	4.519	17.808
	2018	16.869	9.333	0.338	0.703	6.074	17.709
Bank of Baroda	2014	16.884	8.500	0.044	0.442	5.028	17.942
	2015	17.161	10.125	0.075	0.536	4.584	18.038
	2016	17.410	10.750	0.085	1.000	2.602	18.233
	2017	17.558	10.000	0.059	1.000	2.496	18.381
	2018	17.431	9.333	0.099	0.894	2.058	18.628
Barclays Bank	2014	18.647	8.500	0.036	0.762	4.977	19.235
	2015	18.798	10.125	0.005	0.883	4.003	19.300
	2016	18.943	10.750	0.009	0.946	4.168	19.375
	2017	18.942	10.000	0.011	0.906	4.233	19.420
	2018	18.994	9.333	0.018	0.855	4.836	19.600
Bank of India	2014	16.331	8.500	0.006	0.502	4.086	17.353
	2015	16.698	10.125	0.020	0.726	3.445	17.557
	2016	16.773	10.750	0.014	0.720	2.979	17.683
	2017	16.843	10.000	0.021	0.660	2.827	17.852
	2018	14.418	9.333	0.720	0.045	3.214	17.954
Citibank	2014	16.994	8.500	0.024	0.469	2.833	18.190
	2015	17.097	10.125	0.058	0.429	3.247	18.295
	2016	17.127	10.750	0.019	0.439	3.255	18.453
	2017	17.431	10.000	0.037	0.578	3.257	18.403
	2018	17.090	9.333	0.016	0.483	2.912	18.266
Commercial Bank of Africa	2014	18.308	8.500	0.071	0.645	6.384	19.101
	2015	18.455	10.125	0.106	0.629	6.526	19.189
	2016	18.531	10.750	0.075	0.631	6.863	19.251

Bank	Year	Loan volume s	Interest rate	Credit risk	Liquidity	Volume of deposits	Bank size
Units		Ln	%	Ratio	Ratio	Ratio	Ln
	2017	18.549	10.000	0.083	0.587	7.415	19.320
	2018	18.615	9.333	0.080	0.618	7.121	19.317
Consolidated bank	2014	16.036	8.500	0.120	0.866	7.372	16.529
	2015	16.037	10.125	0.055	0.923	7.619	16.464
	2016	16.031	10.750	0.118	0.965	9.480	16.449
	2017	15.946	10.000	0.153	0.974	14.537	16.415
	2018	15.947	9.333	0.153	0.982	27.522	16.372
Credit bank	2014	15.525	8.500	0.082	0.766	6.194	15.998
	2015	15.774	10.125	0.064	0.975	5.226	16.146
	2016	15.882	10.750	0.072	0.865	3.702	16.320
	2017	16.087	10.000	0.075	0.887	4.440	16.490
	2018	16.383	9.333	0.072	0.993	4.821	16.701
Co-operative bank of Kenya	2014	19.006	8.500	0.019	0.825	3.920	19.469
	2015	19.156	10.125	0.016	0.786	0.419	19.652
	2016	19.377	10.750	0.022	1.003	3.566	19.679
	2017	19.476	10.000	0.035	1.006	3.523	19.774
	2018	19.318	9.333	0.041	0.802	5.150	19.841
Developmen t Bank of Kenya	2014	16.000	8.500	0.270	1.334	2.988	16.245
	2015	15.983	10.125	0.263	1.448	2.875	16.185
	2016	15.983	10.750	0.260	1.514	2.858	16.613
	2017	16.035	10.000	0.210	1.477	3.281	16.607
	2018	16.045	9.333	0.208	1.743	3.550	16.805
Diamond Trust Bank	2014	18.740	8.500	0.012	0.855	5.312	19.170
	2015	18.995	10.125	0.024	0.915	7.742	19.420
	2016	19.043	10.750	0.032	0.782	7.023	19.609
	2017	19.094	10.000	0.067	0.736	6.864	19.711
	2018	19.079	9.333	0.063	0.683	6.272	19.750
Dubai bank	2014	12.565	8.500	0.003	0.726	0.988	17.557
	2015	12.606	10.125	0.008	0.720	0.936	17.683
	2016	12.604	10.750	0.005	0.660	0.949	17.852
	2017	12.580	10.000	0.000	0.246	0.931	14.775
	2018	14.572	9.333	0.004	0.667	2.720	15.474
Ecobank	2014	16.950	8.500	0.087	0.709	3.088	17.643
	2015	17.204	10.125	0.062	0.859	3.481	17.775

Bank	Year	Loan volume s	Interest rate	Credit risk	Liquidity	Volume of deposits	Bank size
Units		Ln	%	Ratio	Ratio	Ratio	Ln
	2016	17.013	10.750	0.163	0.759	4.239	17.668
	2017	16.611	10.000	0.377	0.375	7.287	17.794
	2018	16.382	9.333	0.174	0.291	7.799	17.813
Equity Bank	2014	19.182	8.500	0.034	0.873	3.826	19.658
	2015	19.414	10.125	0.027	0.893	3.989	19.875
	2016	19.399	10.750	0.063	0.789	4.075	19.976
	2017	19.447	10.000	0.055	0.748	4.117	20.078
	2018	19.510	9.333	0.049	0.703	4.665	20.167
Family bank	2014	17.838	8.500	0.020	1.185	3.365	17.940
	2015	17.451	10.125	0.037	0.605	5.899	18.213
	2016	17.731	10.750	0.120	1.212	2.865	18.057
	2017	17.588	10.000	0.192	0.918	3.603	18.052
	2018	17.602	9.333	0.162	0.910	3.810	18.020
First Community Bank	2014	16.094	8.500	0.151	0.732	9.371	16.542
	2015	16.208	10.125	0.235	0.886	8.140	16.494
	2016	16.208	10.750	0.320	0.864	6.428	16.521
	2017	16.090	10.000	0.408	0.658	7.312	16.670
	2018	16.016	9.333	0.488	0.618	13.559	16.699
Guaranty Trust Bank	2014	16.778	8.500	0.130	0.657	4.093	17.634
	2015	16.791	10.125	0.092	0.744	3.345	17.528
	2016	16.783	10.750	0.111	0.715	3.316	17.286
	2017	16.838	10.000	0.109	0.744	3.289	17.277
	2018	16.795	9.333	0.147	0.686	3.424	17.452
Guardian Bank	2014	16.060	8.500	0.013	0.746	7.203	16.495
	2015	16.039	10.125	0.030	0.740	6.296	16.497
	2016	16.010	10.750	0.017	0.729	5.728	16.504
	2017	16.079	10.000	0.045	0.733	5.524	16.576
	2018	16.016	9.333	0.049	0.677	5.214	16.600
Gulf African Bank	2014	16.440	8.500	0.065	0.873	5.018	16.799
	2015	16.552	10.125	0.084	0.811	4.904	17.023
	2016	16.600	10.750	0.092	0.744	5.100	17.117
	2017	16.780	10.000	0.093	0.743	5.391	17.260
	2018	16.934	9.333	0.000	0.847	4.356	17.322
Habib Bank Ltd	2014	15.148	8.500	0.075	0.733	3.988	16.576

Bank	Year	Loan volume s	Interest rate	Credit risk	Liquidity	Volume of deposits	Bank size
Units		Ln	%	Ratio	Ratio	Ratio	Ln
	2015	15.188	10.125	0.079	0.575	3.697	16.141
	2016	15.154	10.750	0.187	0.464	3.842	16.342
	2017	17.406	10.000	0.180	1.351	3.877	18.028
	2018	17.368	9.333	0.178	1.251	3.855	17.919
Housing finance Company ltd	2014	17.628	8.500	0.061	1.253	2.122	17.926
	2015	17.786	10.125	0.044	1.273	4.364	18.087
	2016	17.813	10.750	0.069	1.407	4.040	18.091
	2017	17.720	10.000	0.108	1.351	4.034	18.028
	2018	17.587	9.333	0.249	1.251	4.337	17.919
I&M Bank	2014	18.538	8.500	0.010	0.985	4.995	18.989
	2015	18.666	10.125	0.025	0.961	4.763	19.072
	2016	18.718	10.750	0.029	0.919	5.440	19.165
	2017	18.846	10.000	0.087	0.904	5.253	19.297
	2018	18.932	9.333	0.077	0.782	6.039	19.480
Jamii Bora Bank Ltd	2014	15.638	8.500	0.083	0.730	3.732	16.389
	2015	16.134	10.125	0.052	0.928	4.760	16.636
	2016	16.052	10.750	0.172	1.159	2.894	16.574
	2017	15.933	10.000	0.133	1.555	2.274	16.371
	2018	15.929	9.333	0.134	1.554	2.369	16.258
KCB Bank	2014	19.464	8.500	0.031	0.752	5.298	20.011
	2015	19.662	10.125	0.045	0.815	6.949	20.140
	2016	19.771	10.750	0.071	0.861	4.850	20.204
	2017	19.862	10.000	0.077	0.846	5.420	20.287
	2018	19.938	9.333	0.063	0.848	4.524	20.387
Middle East Bank (K) Ltd	2014	15.100	8.500	0.158	0.786	3.380	15.356
	2015	15.073	10.125	0.155	0.880	3.376	15.287
	2016	15.101	10.750	0.159	0.905	3.369	15.471
	2017	14.834	10.000	0.181	0.709	3.378	15.449
	2018	14.756	9.333	0.382	0.618	3.728	15.495
M-Oriental bank ltd	2014	15.692	8.500	0.088	0.458	2.388	16.128
	2015	15.701	10.125	0.082	0.957	2.278	17.234
	2016	15.708	10.750	0.082	0.957	2.488	16.110
	2017	15.800	10.000	0.072	0.975	2.583	16.174
	2018	15.831	9.333	0.094	1.013	2.759	16.168

Bank	Year	Loan volume s	Interest rate	Credit risk	Liquidity	Volume of deposits	Bank size
Units		Ln	%	Ratio	Ratio	Ratio	Ln
National Bank of Kenya	2014	18.000	8.500	0.119	0.627	9.346	18.628
	2015	18.032	10.125	0.112	0.613	10.504	18.647
	2016	17.823	10.750	0.175	0.586	15.080	18.535
	2017	17.774	10.000	0.300	0.555	19.755	18.515
	2018	17.682	9.333	0.391	0.483	28.804	18.559
NIC Plc bank	2014	18.426	8.500	0.013	1.001	3.422	18.798
	2015	18.557	10.125	0.091	1.020	3.476	18.926
	2016	18.556	10.750	0.113	1.024	3.130	18.948
	2017	18.601	10.000	0.109	0.862	3.578	19.144
	2018	18.576	9.333	0.122	0.809	4.683	19.155
Paramount Bank Ltd	2014	15.308	8.500	0.066	0.553	5.851	16.158
	2015	15.586	10.125	0.052	0.728	5.267	16.169
	2016	15.573	10.750	0.083	0.757	4.680	16.059
	2017	15.591	10.000	0.106	0.764	4.460	16.071
	2018	15.546	9.333	0.132	0.695	5.158	16.107
Prime Bank	2014	17.356	8.500	0.013	0.767	6.685	17.821
	2015	17.530	10.125	0.017	0.808	6.084	17.990
	2016	17.488	10.750	0.036	0.798	4.581	17.995
	2017	17.478	10.000	0.049	0.680	4.856	18.172
	2018	17.420	9.333	0.061	0.517	3.541	18.422
Sidian Bank	2014	16.162	8.500	0.074	0.866	5.072	16.576
	2015	16.343	10.125	0.128	0.936	3.534	16.766
	2016	16.413	10.750	0.238	0.982	3.585	16.854
	2017	16.250	10.000	0.278	0.894	3.805	16.776
	2018	16.391	9.333	0.204	0.775	4.353	17.047
Stanbic Bank Kenya Ltd	2014	18.460	8.500	0.038	0.765	3.490	19.487
	2015	18.469	10.125	0.023	0.988	3.501	19.155
	2016	18.566	10.750	0.027	0.969	3.663	19.185
	2017	18.687	10.000	0.021	0.844	4.433	19.332
	2018	18.803	9.333	0.014	0.765	4.843	19.487
Standard Chartered Bank	2014	18.626	8.500	0.072	0.797	4.246	19.220
	2015	18.562	10.125	0.101	0.669	4.285	19.271
	2016	18.625	10.750	0.083	0.658	4.432	19.339

Bank	Year	Loan volume s	Interest rate	Credit risk	Liquidity	Volume of deposits	Bank size
Units		Ln	%	Ratio	Ratio	Ratio	Ln
	2017	18.654	10.000	0.090	0.592	5.051	19.471
	2018	18.592	9.333	0.117	0.529	5.369	19.469
Spire Bank Ltd	2014	16.125	8.500	0.251	0.704	9.922	16.624
	2015	15.934	10.125	0.333	0.802	5.104	16.488
	2016	15.822	10.750	0.168	0.870	4.509	16.440
	2017	15.472	10.000	0.427	0.769	5.650	16.227
	2018	15.307	9.333	0.560	0.667	4.268	16.037
Transnationa l Bank	2014	15.609	8.500	0.088	0.785	4.000	16.142
	2015	15.710	10.125	0.110	0.877	3.730	16.162
	2016	15.667	10.750	0.116	0.796	3.843	16.155
	2017	15.703	10.000	0.242	0.836	2.652	16.142
	2018	15.706	9.333	0.270	0.826	4.158	16.141
UBA Kenya Bank Ltd	2014	13.506	8.500	0.063	0.205	3.140	15.375
	2015	14.821	10.125	0.018	0.661	3.697	15.867
	2016	14.933	10.750	0.019	1.570	0.909	15.539
	2017	15.000	10.000	0.044	1.093	1.385	15.688
	2018	15.053	9.333	0.128	0.571	2.778	16.545
Victoria Commercial Bank	2014	16.487	8.500	0.000	0.836	3.179	16.142
	2015	16.531	10.125	0.028	0.765	3.188	19.487
	2016	16.543	10.750	0.000	0.974	3.147	16.925
	2017	16.753	10.000	0.001	1.010	3.385	17.073
	2018	16.933	9.333	0.031	0.950	3.829	17.292

Source: Annual Financial Reports of Commercial Banks in Kenya (2019)