

**THE EFFECTS OF CREDIT RISK MANAGEMENT ON FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

BY

CHENANE JOAN KISAKA

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DECLARATION


I declare that this research project is my original work and has not been submitted for the award of any degree in any other university

Sign.......... Date.....21/11/2022.....

Chenane Joan Kisaka

D63/36362/2020

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

Sign.......... Date.....21/11/2022.....

DR. Angela Kithinji

Senior Lecturer, Department of Finance and Accounting.

Faculty of Business and Management Sciences,

University of Nairobi.

DEDICATION

I dedicate this project to my parents for their selflessness in raising us. You instilled in us the importance of love, stoicism, perseverance, and honesty. You send us to school in order for us to, in your words, "not be like you." God's blessings on you.

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TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
LISTS OF TABLES	viii
LISTS OF FIGURES	ix
ABBREVIATIONS	x
ABSTRACT	xi
CHAPTER ONE: INTRODUCTION	1
1.1 The Research's Background	1
1.1.1 Management of risk related to credit	3
1.1.2 Performance from a financial perspective	5
1.1.3 Management of Risk related to Credit and Firm's Performance from a Financial Perspective	7
1.1.4 Commercial Banks registered in Kenya	9
1.2 Problem Statement	9
1.3 Objective of the Research in General	11
1.4 Research Value	12
CHAPTER TWO: REVIEW OF THEORIES AND EMPIRICAL RESOURCES	13
2.1 Introduction	13
2.2 Review of various Theories	13
2.2.1 Theory of Credit risk	13
2.2.2 Theory of Moral Hazard	13
2.2.3 Theory of Information Asymmetry	14
2.3 Determinants of Credit risk management	14
2.3.1 Non- Performing Loans	14
2.3.2 Ratio of Adequacy of Capital	15
2.3.3 Loan-Deposit Ratio (LDR)	15
2.3.4 Bank Size	16
2.4 Empirical Review	16
2.5 Literature Review Synopsis	20

2.6 Conceptual Framework	21
CHAPTER THREE: METHODOLOGY INCORPORATED DURING THE RESEARCH	22
3.1 Introduction	22
3.2 Research Design	22
3.3 Population selected for research	22
3.4 Data Collection	22
3.5 Analysis of the collected data	22
3.6 Diagnostic tests	22
3.6.1 Normality Tests	22
3.6.2 Linearity Test	23
3.6.3 Testing Homoscedasticity in the data	23
3.6.4 Testing Multicollinearity in the data	23
3.6.5 Testing Stationarity in the data	23
3.7 Analytical Model The regression equation generated thus;	24
CHAPTER FOUR: OUTPUT ESTABLISHED, INTERPRETATION AND DISCUSSING OUTCOMES	25
4.1 Introduction	25
4.2 Descriptive Statistics	25
4.3 Time Series	27
4.3.1 Time series for Non-Performing Loans/Total Loans for 2011 to 2021	27
4.3.2 Time series for (CAR) ratio for 2011 to 2021	28
4.3.3 Time series for Loans to Deposits (LDR) ratio for 2011 to 2021	28
4.3.4 Time series of Banks with Commercial features registered in Kenya size commencing 2011 to 2021	29
4.3.5 Time series for Return on Equity (ROE) for 2011 to 2021	30
4.4 Diagnostic tests	31
4.4.1 Multicollinearity Tests	31
4.4.2 Linearity	32
4.4.3 Homoscedasticity	33
4.4.4 Normality tests	35
4.5.2 Anova	37

4.5.3 Regression Coefficient Table	37
4.5.4 Model fitting Equation	39
CHAPTER FIVE	40
SYNOPSIS, CONCLUSIONS AND RECOMMENDATIONS	40
5.1 Introduction	40
5.2 Summary of the Discoveries	40
5.3 Conclusion	42
5.4 Study Recommendations	43
5.5 Ideas for Additional Research	44
REFERENCES	44
Appendix I: Secondary data	49
Questionnaire Data Calculations	50

LISTS OF TABLES

Table 4. 1: Descriptive Statistics	25
Table 4. 2: Multicollinearity	31
Table 4. 3: ANOVA for testing linearity between ROE and NPLR.....	32
Table 4. 4: ANOVA for testing linearity between ROE and Capital Adequacy ratio	32
Table 4. 5: ANOVA for testing linearity between ROE and Loans to deposits ratio.....	33
Table 4. 6: Testing for Stationarity using Augmented Dickey-Fuller Statistic	34
Table 4. 7: Normality Tests	35
Table 4. 8: Model Summary	36
Table 4. 9: ANOVA demonstrating Regression model fitness.....	37
Table 4. 10: Regression coefficient Table	37

LISTS OF FIGURES

Figure 1: Conceptual Framework	21
Figure 2: Time series for Non-Performing Loans/ Total Loans for 2011 to 2021	27
Figure 3: Time series for Capital Adequacy (CAR) ratio for 2011 to 2021	28
Figure 4: Time series for Loans to Deposits (LDR) ratio for 2011 to 2021	29
Figure 5: Time series for Bank Size for 2011 to 2021.....	30
Figure 6: Time series for Return on Equity (ROE) for 2011 to 2021	31
Figure 7: Scatter graph between ROE and NPLR	34
Figure 8: Showing ROE population has normal distribution	36

ABBREVIATIONS

CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
IMF	International Monetary Fund
KYC	Know your Customer
LA/TD	Total Loans to Total Deposits
LDR	Loans to Deposit Ratio
NPL	Non- Performing Loans
PAR	Portfolio at Risk
ROA	Return on Assets
ROE	Return on Equity

ABSTRACT

The research's intention was to determine how management procedures of risk linked with credit affected Kenyan commercial banks' performance from a financial viewpoint, by the use of panel data from 2010 to 2021. Specifically, the study was after determining how the non-performing loans, ratio related to capital adequacy, bank size, total deposit to total loans ration related with commercial banks located in Kenya performance financially. On the website of the Central Bank of Kenya, secondary data was gathered. Various diagnostics were run which proved the suitability of the data to run inferential tests statistics like multiple linear regression. The findings demonstrated that how profitable the Kenya's commercial banks were, as measured using Return of Equity, was significantly impacted negatively by the non-performing loans ratio. One unit increase in NPLR decreased profitability by 54% (significant $p=0.013$). This is because nonperforming loans represent the opportunity cost of interest income and, as a provision for nonperforming loans, form part of a bank's expenses which reduces the objective of being profitable by commercial banks. Also, the research discovered that capital adequacy related positively and had a substantial connection with how profitable Kenya commercial banks were. A one-unit increase in capital adequacy ratio (CAR) boosted Kenya's commercial bank profitability by a significant level of 11.7%. Thirdly, the research found that a unit rise in LDR increased the profitability objective by 13.4%. However, this finding was non-significant. Finally, the research looked at how size of the bank as measured by the total assets' logarithm which was natural in nature affected the way commercial banks behaved from a profitability point of view. The findings established that as bank size rose by a single unit, the outcome was a 12.2 % significant rise in Returns on Equity. The study also found that the greatest contribution to changes in the way Kenyan commercial banks performed financially were commercial bank size and loans that were non-performing in nature, therefore the study recommended financial institutions in Kenya to put proper controls around loan processes and small banks to merge to increase their size to generate more returns to shareholders. The findings established that as size of the bank rose by a single unit, a 12.2 % significant rise in Returns on Equity resulted.

CHAPTER ONE: INTRODUCTION

1.1 The Research's Background

Bank that are commercial in nature majorly make profits out of the interests they charge customers from the loans they give out. However, not always do customers pay promptly the principal and interest due from them at the end of every loan repayment term. As a result, that portion of principal and interest unpaid is classified as non-performing loans (NPL). Central Bank of Kenya (2013) provides a definition of non-performing loans as those on default for a period exceeding 90 days. Wherever this occurs commercial banks are expected degrade the loan and begin recovery effort to secure the bank from making losses. Credit risk occurs when a greater portion of a bank's portfolio remains unpaid when expected mostly on monthly basis. Historically, NPLs impair commercial banks' balance sheet, stops the issuance of loans to deserving customers, and ultimately result in reduced liability and assets (IMF, 2016). IMF also found a strong correlation between bank crises and higher non-performing loans for the collapsed financial institutions across the world. This means therefore NPLs is a great risk to financial institution which require close monitoring and effective control procedures put in place to mitigate their impact in effecting banks performance and resulting to banks collapse.

Past studies have associated non-performing loans with increased unemployment, economic growth decline, as well as an upsurge in rates of interest (Soyemi,Ogunleye, &Ashogbon,2014). This therefore means that financial institutions need to understand their customer's reasons for struggling payment and appropriately look for ways to help their clients by restructuring the repayment period or giving moratorium period to allow for stabilization of economy. Other elements contributing to more non-performing loans include poor appraisal process by the lending officers, ineffective recovery system, and dishonesty of credit officers colluding with customers (Li & Zou, 2014).

When the greater portion of the banks that are commercial nature's credit portfolio of a comprises non-performing loans, this scenario can impair the way the bank performs from a financial viewpoint and significantly jeopardize the continuity of bank operations. This is because loan processing to deserving cases will be impaired, and provision for bad debts

will consume the profits level of the bank hence negatively affecting performance. Credit risk over the past has been measured using capital adequacy (Soyemi, Ogunleye & Ashogbon, 2014) Capital adequacy is a credit risk measurement indicator used to protect depositors and at the same time promote the efficiency of the financial system and its stability. The level of capital adequacy provides some level of assurance of the extent commercial can sustain losses before finally becoming insolvent (Afriyie & Akotey, 2012).

Increased capital therefore means protection from commercial bank failures, and funds belonging to depositors are usually given priority in resolutions. Under Basel II, the agreed minimum risk-weighted asset ratio for banks is 8%, and under Basel III it is 10.5%. Therefore, higher capital levels protect depositors' money. In this study, a bank's total capital divided by risk-weighted assets aided in providing the capital adequacy's measurement. In Jordan, Moh'd Al-Tamimi and his Obeidat (2013) sought to verify whether there are substantial variations between adequacy of bank's capital and how banks perform from a profitable point of view. The outcome revealed that capital adequacy, liquidity risk and return on capital related inversely.

The loan-to-deposit ratio compares total loans and total deposits over a given duration to determine how liquid the bank is. Division of the total loans by deposits for the same duration helps to derive the ratio. A ratio of less than 1 indicates that banks did not need to borrow money to fulfill their lending responsibilities and instead provided credit to their customers purely from internal deposits. However, a fairly low ratio means the bank is not generating an optimal rate of return, and a highly high ratio could indicate that the bank lacks the liquidity to cover unforeseen funding requirements (Bhatterai, 2016). Previous studies have had mixed reactions to the way LDR affected how commercial banks

performed from a profitable point of view. However, because banks that are commercial in nature today have multiple sources of revenue, LDR alone is not a sufficient parameter to measure a bank's liquidity. Bank size and its impact have been incorporated in several studies to measure risk linked with lending financial resources. Bank size refers to a bank's ownership of the number of customers and assets it relies on to generate revenue. Jordan Aladwan (2015) used panel data from 2007 to his 2012 to scrutinize how size impacts the way banks behaved profitably. The results show that there is a considerable difference between bank size and how profitable a firm is, as quantitatively assessed by return on equity. In this research, we used natural logarithm of total assets over the last 10 years to measure bank size.

1.1.1 Management of risk related to credit

The probability that a financial firm may lose money on loans it has given to customers is known as credit risk. Therefore, every commercial bank is expected by Central bank to establish credit risk division including credit risk control unit, credit risk analysis unit, portfolio management unit, recovery unit to support effective credit risk management of banks credit portfolio (Li& Zou, 2014). According to the Central bank mitigating credit risks require every lending institution to anticipate the number of loan losses that may arise from its credit portfolio every year from its net profit, create provision for bad debts and maintain appropriate capital reserves to cushion the bank and protect the depositor's savings used for lending transactions.

Kalui and Kiawa (2015) looked at credit risk management as risk control, conducting thorough credit appraisal, and efficient management of credit portfolio which includes such actions as making customer visits, conducting callbacks, and including guarantees and maintaining proper documentation. In instances where commercial banks are uncertain about the proportion of their loan customers who may default is dangerous since they cannot be sure of their earning potential and earnings estimates may be unrealistic. Every

loan issuing sector to some extent experiences loan losses thus exposing the institution's risk to the variability of profits. Therefore, there is a chance of losing money if interest and principal aren't paid back for longer than 90 days (CBK, 2013).

For commercial banks, a number of initiatives have been made to lower credit risk. Every bank is required to follow the Basel committee's "know your customer" (KYC) procedures, which is the first crucial strategy. Banks need to know and understand the nature of the business the customer does. The bank must conduct due diligence and perform references to establish credit customer character in other places they have taken the loan, and examine the credit reference bureau to evaluate how credit worthy the customer is. Hence, the customer will require the bank to not only go beyond data-related facts but look at other qualitative aspects like their attitude towards money and past dealing with others.

The aim of putting in place practices for managing credit risk is to reduce Non-Performing Loans (NPLs) which is the yardstick used to measure credit risk management practices. The central bank has recommended several practices to help commercial banks have quality loans book which include, the creation of a credit risk control unit, portfolio management of loans, quality appraisal, risk analysis, assets aging, loan loss classification and provisioning (Tanui, Wanyoike&Ngahu, 2015).

Generally, credit risk management involves several steps commercial banks take which include among others; quality loan appraisals, risk identifications, measuring the likelihood of customers' default position, loan monitoring, and developing mitigation strategies to reduce the exposure levels to an acceptable position. This is accurate given the considerable risk that non-performing loans (NPLs) represent to commercial banks' ability to continue operating. First investors check the quality of the loan book before they make a purchase of shares in commercial banks and a higher percentage of NPLs weakens the share price in the stock market (Raad, 2015). Secondly, it is a central bank requires that all commercial banks must provide from their net profit a certain amount on bad debts, this has a detrimental effect on how well commercial banks perform and hence it derails the fulfillment of strategic objectives of the banks (Gakure, Ngugi, Ndwiga&Waithaka, 2012).

Kimotho and Gekara, (2016) noted that every commercial bank can effectively manage risk by first having an elaborate system for risk identification. In this first step, the authors stated that commercial banks review, test the likelihood of the risks, and anticipate possible risks in their lending decisions. Moreover, identification of risks, by and large, entails a thorough analysis of both the present inherent risks in its processes as well as analysis of its future risks. In this manner, commercial banks can plan for how to mitigate the present risks and combat future risks as they emerge in the enterprises. Mutua (2015) supported this approach by arguing that performing comprehensive risk analysis is vital since you cannot manage what you don't know. After highlighting all the possible risks combination likely to affect the business enterprise, the second step is to perform credit risk analysis which involves looking at the credit worthiness of each bank borrower. Credit appraisal or credit risk analysis, according to Lagat, Mugo, and Otuya (2013), places a lot of emphasis on client screening. Such screening methods include looking at the borrower's past credit history and cross-checking the possibility of multiple borrowing by checking each client's credit scoring in the credit reference bureau. This is because according to Lagat, Mugo, and Otuya(2013) past credit bad experiences are likely to recur and therefore borrowers with poor credit scores must justify the fact that they will not default before taking loans. This can be done by increasing security, providing additional guarantors, and putting in place corporate guarantees in case they run companies with assets.

1.1.2 Performance from a financial perspective

Performance from a financial angle is defined as the capability of commercial banks to use their internal assets efficiently and effectively to generate sustainable returns for business growth (Warsame, 2016). Banks therefore make multiple decisions aimed at maximizing profits and minimizing costs. Such decisions may include reviewing the value chain and eliminating processes that add cost as opposed to revenue and this call for lean processes (Fujo & Ali, 2016). Performance from a financial viewpoint therefore is the entire evaluation of an assessment of assets, equity, revenue, expenses, profitability and liabilities of a company. To measure performance from a financial viewpoint bank managers, use

financial formula and ratios which after computation is compared with industry standards or historical performance to assess improvement or decline (Bititci, Garengo, Dörfler & Nudurupati, 2012). Commonly used ratios include gross profit margin. This ratio measures the total revenue left after subtracting costs of sales. The ratio indicates as a percentage the proportion of each sale in shillings which can cover operating expenses (Kolapo, Ayeni & Oke, 2012).

Working capital measurement is also widely used in commercial banks to determine liquidity position to fund day to day operations. Generally working capital show to bank stakeholders, the nature and composition of liquid assets banks keeps which can be converted to cash. It is determined by current assets – current liabilities (Teker, Teker & Kent, 2011). Current ratio is another ratio linked with assessing liquidity which is instrumental to businesses to establish whether the commercial banks owns enough current assets adequate to pay its current liabilities. Inventory turnover ratio is an efficiency measurement ratio which determines how fast commercial banks sell their average inventory within a given financial year. This ratio show whether the inventory is on high demand, obsolete and whether the company has too much inventory. To calculate inventory turnover is costs of sales divided by beginning inventory plus ending inventory divide by two. Leverage measurement is the fourth performance from a financial viewpoint discussed in this paper. Leverage in simple terms can be said to be equity multiplier which commercial banks calculate to determine how much debt they use to acquire assets. It is calculated by formula total assets over total equity. This ratio increases as more and more assets are used to acquire assets. Returns on assets is a performance measurement yardstick

commonly used by commercial banks to determine how the organization is using its assets to make profits. Low returns on assets simply mean the commercial bank is not using its assets well (Gavurova, Belas, Kocisova & Kliestik, 2017). The calculate returns on assets, net profit divide by beginning assets plus ending assets divide by two. However, in this study we shall use return on equity which measures how effective equity utilized by commercial banks to earn investors profits. To calculate return on equity, net profit divide by beginning equity plus ending equity divide by two (Kimocho & Gekara, 2016).

1.1.3 Management of Risk related to Credit and Firm's Performance from a Financial Perspective

Past research studies have shown management of risk related to credit and how commercial banks performed financially being strongly correlated. One such study was performed by Isanzu (2017) in China. To inspect how management of credit risk and performance financially are connected, he employed panel regression models. His independent variables were bad debts to total loans (NPL), Capital Adequacy Ratio (CAR), Impaired Loans, and Allowance for Loan Losses. The variable that was dependent in this research was quantitatively assessed with the aid of Return on Assets (ROA). This research established an association that significant between NPL capital adequacy ratios and performance financially from a statistical point of view. However, there was no association between NPL accrual and NPL cost with performance from a financial perspective that was substantial statistically. Because risk associated with lending of financial resources had an effect on performance financially, the research advised that all Chinese banks undertake stringent control methods to reduce credit risk.

Another study by Ekinc and Poyraz (2019) used his 2017 panel data from 2005 to 2017 to examine the impact of risk linked with credit on how all Turkish depository banks performed financially. In this investigation, secondary data were employed. Return on Assets (ROA) and Return on Equity (ROE) was used and NPL (Non-performing loans (NPL)) was used as the key performance indicators. As a result, a negative relationship was established between NPL and ROE. According to the survey, Turkish commercial banks should focus more on managing credit risk management strategies in order to boost bank profitability. A similar study was conducted and the results were consistent with those of Ekinc and Ekincand Poyraz (2019) agrees, noting that non-performing loans, non-performing loan reserves, and capital adequacy ratios have a statistically significant impact on the Ethiopian commercial banks' performance from a financial viewpoint. Corapo, Nigeria, Ayeni & Oke (2012) used a panel regression model covering the period 2000-2010 to scrutinize the way risk linked with lending of financial resources impacted how commercial banks performed financially. Non-performing loan utilization on gross loans (NPL/LA), gross loans on deposit (LA/TD), and loan loss reserve utilization on classified loans (LLP/CL) were measured. All of these determinants were estimated as a function of commercial bank profitability. Rising non-performing loans have been found to significantly reduce the return on investment (ROA) and have an important outcome on the how profitable in Nigerian commercial banks are. However, the study found that it was growth in gross lending that had a statistically positive outcome on how profitable commercial banks in Nigeria performed. Therefore, the research recommends all Nigerian banks improve credit risk analysis of their loan proposals and create a working credit risk department unit to control credit management.

1.1.4 Commercial Banks registered in Kenya

Kenya has 42 registered banks that are commercial in business perspective serving both individual and corporate clients. Most of these banks serve the function of supporting national savings and lending and facilitating international trade. The banks are regulated by the apex bank which is Central bank of Kenya (CBK) established under an Act of Parliament in March 24th in the year 1966 and began operation in September 14th in the year 1966. The Central Bank mandate operations and functions are now guided by Kenya new constitution in Article 231. The CBK main role is to help the nation formulate and implement monetary policy which promotes price stability in the country. The CBK reports to the Ministry of Finance of Kenya and manages the formulation of the country's monetary policy (Central Bank of Kenya, 2015). CBK highlights various rules and procedures that affect how commercial banks handle their risks linked with credit in a well elaborated document called prudential guidelines to improve bank operations. This category of banks collects deposits from the public and give out loans. The process of giving loans require a well-structured unit to support credit appraisal, credit risk analysis, loans grading as per CBK guidelines and recovery unit to handle delinquent cases.

1.2 Problem Statement

Commercial banks are predominately lending money as a main source of revenue. This lending business is very sensitive and any small change on key determinants of credit risks have far reaching implication to the bank itself and the overall economy. Commercial banks generally get 85 percent of their liability from depositors and use such deposits to support lending operations. In Kenya due to Covid 19 which began late 2019, several customers lost their jobs and business operations experienced downturn which resulted in

increased nonperforming loans. The period 2020 to 2021 saw a rise in bad loans from 12 percent to 14.3 percent. This occasioned several lenders to restructure the loans, pay more attention to customer visits as way of showing better relationships and remain tighter in new loans that were being advanced to prevent escalating incidences of persistent increase in NPLs which saw some banks report over 24 percent as non-performing portfolio (CBK News release March, 2022). Demographics on Kenya bad loans by Central bank over the past years have revealed that majorly three sectors account for over 54 percent of bad loans that is trade, manufacturing and real estate. By the close of 2021, the three sectors cumulatively were owing banks kes 514 billion. The period also saw a big shift where manufacturing companies borrowing overtook real estate bad loans portfolio to kes 89.4 billion, agriculture and real estate construction businesses also had an increase in bad loans (CBK, 2021). To counteract these effects banks were advised by CBK to tighten their credit control, improve credit procedures and processes.

Agang and Njoka (2020) analyzed the impact of risk linked with credit on how profitable a firm is. Previous research has shown a strong correlation between commercial banks' handling of risk related with credit and how they performed financially. His one such research was conducted by Isanzu (2017) in China. He used panel regression models to test the relationship between handling of risk related with credit and how the firms performed financially. Main variable in this study. Bad debt vs. Total Loans (NPL), Capital Adequacy Ratio (CAR), Impaired Loans and Allowance for Loan Losses. He used it to measure independent variables. However, the research's variable that was dependent in nature was quantitatively assessed with the help of return on Assets. The research discovered a connection between NPL, capital adequacy ratios and performance financially that was

significant as seen from a statistical perspective. The study provided a recommendation that all Chinese banks implement strict control measures to mitigate credit risk. This is because it has a direct effect on performance from a financial viewpoint. A study by Ekin and Poyraz (2019) however used a panel regression model to determine factor influencing commercial banks performance from a financial viewpoint in Turkish depository banks. ROA and ROE were used as the dependent variables whereas NPL was incorporated as the key performance from a financial viewpoint indicator. The findings established a negative relationship between NPL and ROE.

Corapo, Ayeni and Oke (2012) used a panel regression model covering 2000-2010 to examine the impact of risk linked with lending financial resources on the performance from a financial viewpoint of commercial banks. Non-performing loan utilization on gross loans (NPL/LA), gross loans on deposit (LA/TD), and loan loss reserve utilization on classified loans (LLP/CL) were measured. All of these determinants were estimated as a function of commercial bank profits. Rising non-performing loans have been found to significantly reduce return on investment (ROA) and have a substantial effect on how Nigerian commercial banks performed from a profitability assessment. However, the analysis identified that it was growth in gross lending that had a positive effect on how Nigerian commercial banks performed from a profitability assessment. Therefore, the research recommends all Nigerian banks to improve credit risk analysis of their loan proposals and establish a functional unit of credit risk department to oversee credit risk management.

1.3 Objective of the Research in General

The overall objective of this study was to determine the effect of credit risk management on the performance from a financial viewpoint of commercial banks in Kenya.

1.4 Research Value

The main conclusions of this study will help policy makers to make decisions about bad debts that will influence the lending decisions of commercial banks in the long run. Of particular interest is to examine how different changes in macroeconomic indicators affect non-performing loans (NPLs). Banking executives and the Central Bank of Kenya will use the research report to understand how best to support Kenya's commercial banks in reducing their bad debt rates. Likewise, the study will also help researchers build a broader theoretical understanding of the technical content of bad debt management in order to increase how Kenyan commercial banks performed from a profitability assessment.

CHAPTER TWO: REVIEW OF THEORIES AND EMPIRICAL RESOURCES

2.1 Introduction

The theoretical validation of this research incorporated pre-selection theory, moral hazard theory, and credit risk theory. The chapter also includes an empirical review, a summary of literature review and a conceptual framework.

2.2 Review of various Theories

2.2.1 Theory of Credit risk

As proposed by Woolcock in 2000, it argues that lenders main aim of giving out credit is to make interest income and therefore they price loan products higher to cater for the costs of defaults on loans, expenses and profit margins they plan to receive. The borrowers normally provided with loan terms in the letter of offer which they are supposed to agree to the same terms. When interest rates rise, borrowers tend to be reluctant to borrow, and when interest rates fall, demand for credit increases. Commercial banks keep varying the terms of credit based on close monitoring of its Non- Performing loans (NPLs) indicators, higher NPL disallows commercial banks to increase its lending practices and therefore a bank may decide to tighten its lending and improves lending when NPL is at manageable level. Credit theory therefore explains the behaviors of commercial banks towards credit based on Non- Performance Loans rates.

2.2.2 Theory of Moral Hazard

Zeckhauser (1970) advanced the above theory. This theory states that borrowers will tend to be rather careless on the use of credit they get from commercial banks so long as they are aware they can refuse to pay the loans and such facilities can be written off. Applying this theory, borrowers often look for ways to compromise the loan officers and stop paying the debt then the loan officers encourage the bank to write off the loan facility. Such situations can simply discourage good paying customers to transform as bad borrowers defaulting paying their facilities given to them by commercial banks. In order to prevent moral hazards credibility of credit officers before hiring anyone to work in credit department is very important. Character assessment must be given due consideration.

2.2.3 Theory of Information Asymmetry

As suggested by Akerlof in 1970, it states that in the market, both borrowers and lenders rely on market statistics to set prices. According to Akerlof, the information asymmetry gives sellers everything they need to price loans relatively cheaply and generate high demand. This is because borrowers are often attracted to low interest rates. “Therefore, the availability of information influences credit decisions (Parrenas, 2005). This theory describes a situation in which both lenders and borrowers are unaware of credit behaviors of each other and therefore banks make decisions based on guidelines on credit appraisal which includes factors such as ability to repay based on customers turnover but ordinarily paying loans well is influenced with other factors which may not be at the privacy to the lenders. Application of this theory developed banks credit sharing platform through credit bureaus where customers with good repayment history may get lower interest rates as opposed to risky customers with poor credit history.

2.3 Determinants of Credit risk management

2.3.1 Non- Performing Loans

Non-performing loans (NPLs) are defined by the Central Bank of Kenya as loans that are overdue because the borrower has not made his payments for more than 90 days. Wanjira (2010) found bad loans can accrue in commercial banks due to poor appraisal systems, dishonest employees and tough business environment facing customers. Her recommendations were the need for customer relationship management, restructuring of bad loans and proper credit appraisals as ideal in reducing non-performing loans in commercial banks. Bad debt is costly for commercial banks. First, banks will not be able to increase their interest income on non-performing loans. Second, commercial banks have to set aside a portion of their profits as provisions for bad debts, which reduces profitability. It also reduces the number of borrowable funds that can generate interest income for banks (Hossain, 2017). Previous analyses depict that non-performing loans adversely affect how commercial banks performed from a profitability assessment and that an increase in non-performing loans threatens the viability of commercial banks and can drive them into bankruptcy (Eze & Ogbulu, 2016).

2.3.2 Ratio of Adequacy of Capital

It is the amount that banks deduct from loans and other assets (Basel III, 1988). This directly affects the stability of banks to continue to operate in the future (Wen, 2012). Bank investors often struggle with the concept of capital adequacy and its determinants in financial markets (Ongore, 2012). The new capital framework for commercial banks is to follow the Basel Accord. A bank's performance measurement is often related to its efficiency. Researchers and industry practitioners use the cost/income ratio. Equity capital affects the level of profitability. Capital in the context of banking can be defined as the amount of own funds that can be used, sometimes acting as a buffer in adverse circumstances. Capital generally creates a liquidity position in commercial banks because bank deposits are often unreliable and can be withdrawn by depositors at any time. Therefore, it is capital that eases the bank's financial difficulties. Previous researchers who examined the impact of capital adequacy on performance from a financial viewpoint of commercial banks used the capital adequacy ratio (CAR). In fact, CAR is a measure of a commercial bank's internal strength to absorb losses during a crisis (Dang, 2011). Before the last major financial crisis of 2007-2009, the CBK raised the minimum capital requirements for all banks that were on the basis of commercial in Kenya. All commercial banks which are Tier 1 Banks are supposed to maintain Kenyan shillings 1 billion to cushion depositors in case of losses. The central banks in proposing the new rule recommended to small banks to merge to increase their capital margins.

2.3.3 Loan-Deposit Ratio (LDR)

The above is a very imperative parameter for measuring the efficiency of banking operations to generate higher profits. It is often cheaper to keep the loan-to-deposit ratio below 1. A value greater than 1 means that the bank relies on loans to lend money, as this is costly and reduces the bank's overall profit margins. LDR determines the financial strength of a bank's liquidity position. For example, more deposits in the financial sector means more money to lend, which can lead to a corresponding increase in revenue (earnings). This ratio is meaningful because it indicates whether a financial institution is being prudently managed and therefore doing well for investors. With fewer deposits,

banks may struggle to raise enough funds to meet loan demand. A bank that borrows money and lends it to customers has lower profit margins than a financial institution that mobilizes deposits and lends to customers. Banks are advised not to have loan-to-deposit ratios too low or too high, but often have to maintain the right delicate balance to maximize yields.

2.3.4 Bank Size

Shamukhi (2016) conducted a study to establish how bank size and performance from a financial viewpoint of commercial banks in Jordanian banks are interrelated. The outcomes show that bank size is not significantly linked to commercial bank profitability as quantitatively assessed with the assistance of return on assets (ROA). However, Abel as well as Le Roux (2016) conducted a similar study in Zimbabwe and found opposite results, finding an inverse relationship between bank size and how commercial banks performed from a profitability evaluation. The study found that larger banks are less profitable in the financial sector, while smaller banks are more profitable. Shehzad (2013) investigated whether there is a significant relationship between bank size and how commercial banks performed from a profitability evaluation. They found no significant relationship between bank size and Return on Equity (ROE). Sufian and Kamarudin (2012), on the other hand, analyzed whether there was a significant association between banks size and performance from a financial viewpoint of commercial banks by the use of panel data between 2000 and 2010. Bank size was found to have a direct and statistically significant positive influence on how commercial banks performed from a profitability evaluation in Bangladesh.

2.4 Empirical Review

Poudel (2012) used an 11-year panel regression model from 2001 to 2011 to analyze the impact of credit risk on how commercial banks performed from a profitability evaluation. The credit risk variables examined included capital adequacy ratio (CAR), cost per borrowed asset, and non-performing loan ratio (bad debt). The study found that an increase in non-performing loans significantly reduces performance from a financial viewpoint, while an increase in capital adequacy ratio has a marginally significant association with performance from a monetary viewpoint. The study also found that lowering the cost per

loan asset significantly improved how commercial banks performed from a profitability evaluation. However, in terms of strength, bad debt was the best predictor of performance. Alshatti (2015) investigated whether there is a link between credit risk management and the performance from a financial viewpoint of Jordanian commercial banks. In this study, he used his 10-year panel regression model from 2005 to 2013. The results show that an rise in NPLs significantly reduces the performance from a financial viewpoint of commercial banks. The results showed that an appropriate risk management framework needs to be put in place and rigorously reviewed to address emerging business risk areas. The study recommends implementing customer relationship management as part of managing risk linked with lending financial resources to improve credit efficiency. Kolapo, Ayeni, and Oke (2012) investigated the impact of credit risk on how Nigerian commercial banks performed using 11 years of secondary data. Performance from a financial viewpoint is quantitatively assessed with the help of ROA as a function of independent variables such as the ratio of non-performing loans (NPL) to total loans, total loans to total deposits (LA/TD), and loss rate.

In this study, all independent variables were used to measure credit risk. As a result, it became clear that the non-performing loans and performing from a financial viewpoint are inversely associated. Rising bad debt has been found to reduce the size of commercial banks' profit margins. Similarly, the study found the reserve ratio (LLP/CL) and gross lending to deposit with return on assets (ROA) as being directly connected. LLP/CL and LA/TD unit changes proportionally increased return on assets (ROA) ratios. A 1 unit increase in NPL resulted in a 6.2% increase in Return on Assets (ROA), a one unit change in loan loss reserves resulted in a minimal change in Return on Assets (ROA) of 0.65%, while at the same time, total loans and advances increased profitability by 43%. Similarly, a study conducted in Nigeria by Ogboi and Unuafe (2013) inspected the way adequacy of capital related with performing from a financial viewpoint for a panel dataset from 2004 to 2009 in Nigeria Commercial Banks. The study found a statistically significant negative association between risk provisioning and ROE. Mendoza and Rivera (2017) investigated the impact of credit risk on the profitability of local banks in the Philippines. Results showed that capital adequacy was not significantly related to commercial banks. However, bad debts were significantly negatively related to return on assets (ROA). However,

Bhatterai (2016) examined the impact of credit risk management practices in Nepal and how they affected the performance from a financial viewpoint of commercial banks. The survey design adopted a descriptive design and in the six years from 2010 to 2015 he collected data from 14 commercial banks. The study found no statistically significant relationship between bank size and commercial bank performance from a financial viewpoint, but found a negative relationship between NPL and performance from a financial viewpoint. However, the loan-to-deposit ratio has been found to have a positive impact on return on assets (ROA). On the other hand, Kalui and Kiawa (2015) investigated the impact of credit risk management on the performance of microfinance institutions. The findings were that credit scoring, risk management and compliance, risk identification, and good credit customer relationship management are common credit risk management practices in microfinance institutions. Kibor, Ngahu, and Kwasira (2015) scrutinized how practices associated with handling risk linked with lending of financial resources affected performing from a monetary viewpoint. There was a statistically significant association between credit performance and credit criteria. However, the study did not consider variables such as customer relationship management that are related to performance from a financial viewpoint. Ndero, Wepukhulu, and Bogonko (2019) conducted a study on the relationship between credit ratings and credit performance in commercial banks in Uasin Gishu County. The target group was microfinance personnel. As a result, it was found that 78.1% conduct credit checks using the 5 Cs of credit checks, including credit checks by credit bureaus. The results also showed a significant positive association ($r = 0.206$ and $p = 0.035$) between credit rating and credit performance. Varathan, Kalyanasundaram, and Tamilenthî (2012) used ratio analysis to study credit policy and credit ratings. Credit checks have proven to be very important and determine whether to reject or accept a loan offer. Credit management practices such as risk management can prevent microfinance companies from incurring losses, as microfinance companies use bogus procedures and processes such as issuing offer letters without proper legal documentation.

Mugenda, Momanyi, and Naibei (2012) investigated the impact of risk management practices on the performance from a financial viewpoint of sugar producers in Kenya. This study used structured questionnaires and interviews to collect data. The results showed that Kenyan sugar companies' risk management practices were important to their performance

from a financial viewpoint ($r=0.67$). The study's recommendations included integrating risk management to reduce losses and increase business profitability. Soyemi, Ogunleye, and Ashogbon (2014) conducted a research study on the risk management practices of Nigerian deposit-taking commercial banks for a period between 2007 to 2012. Results show a strong correlation between non-performing loans, capital adequacy and operating costs. Olamide, Uwaromwa, and Ranti (2015) however, identified the effects of effective risk management on the performance from a financial viewpoint for commercial banks listed in stock market. The result established that a non-significant negative association exists between risk management practices and the performance from a financial viewpoint of commercial banks in Nigeria. Halim, Mustika, Sari, Anugerah, and Mohd-Sanusi (2017) examined the impact of the intermediation effect of risk management boards on the relationship between corporate governance and firms' performance from a financial viewpoint. Data came from 299 selected companies and only secondary data were used in the study. The results show that the risk management committee has a significant impact on firm performance, and the risk committee is an intervening variable between corporate governance, performance from a financial viewpoint, and firm size. However, Gisemba (2010) examined the impact of credit risk management on performance as measured by the return on investment (ROA) of 41 Sacco's in Kenya. The research established a direct and noteworthy connection between SACCO's performing from a monetary viewpoint and its use of effective practices associated with handling risk linked with lending of financial resources. However, Omasete (2014) examined the relationship between techniques associated with handling risk linked with lending of financial resources affected performing from a monetary viewpoint of insurance organizations. Research results found a positive relationship between techniques associated with handling risk linked with lending of financial resources and the performance from a financial viewpoint of savings and credit institutions. However, research has shown that risk identification contributes more to return on investment (ROA) than other aspects such as monitoring and control, risk analysis, credit evaluation and portfolio management, and credit ratings. The study recommends considering different approaches when analyzing credit risk management. Koir (2012) investigated the impact of Kenya's practices associated with handling risk linked with lending of financial resources on the performing from a financial viewpoint of deposit-taking microfinance

institutions. This study design was a descriptive survey of data collected using interviews and questionnaires from 36 employees. The results showed that collateral used in microfinance, borrower characteristics, and cash flow analysis were the main screening methods used to manage credit risk. The study found a connection between the approach used by microfinance institutions associated with handling risk linked with lending of financial resources and their performance from a financial viewpoint being substantial and positive in nature.

2.5 Literature Review Synopsis

The literature reviewed has found that non-performing loans is a noteworthy aspect in influencing how commercial banks perform across the globe. Therefore, most of commercial banks put measures in order to control escalating non-performing loans by establishing credit risk control, giving out quality loans and proper training of credit officers to be keener in eliminating bad loans at the appraisal stage. The literature however found mixed effects between capital adequacy and performing from a financial viewpoint of commercial banks. Some studies found negative association between adequacy of capital and performance from a financial viewpoint while others found a positive association between capital adequacy and performing from a financial viewpoint (Poudel,2012; Kolapo, Ayeni, & Oke,2012). Most of the studies reviewed never found any significant association between bank size and performance from a financial viewpoint of commercial banks (Shamukhi,2016; Sufian&Kamarudin,2012; Shehzad, 2013).

2.6 Conceptual Framework

Theoretical Review

Independent Variable

Dependent Variable

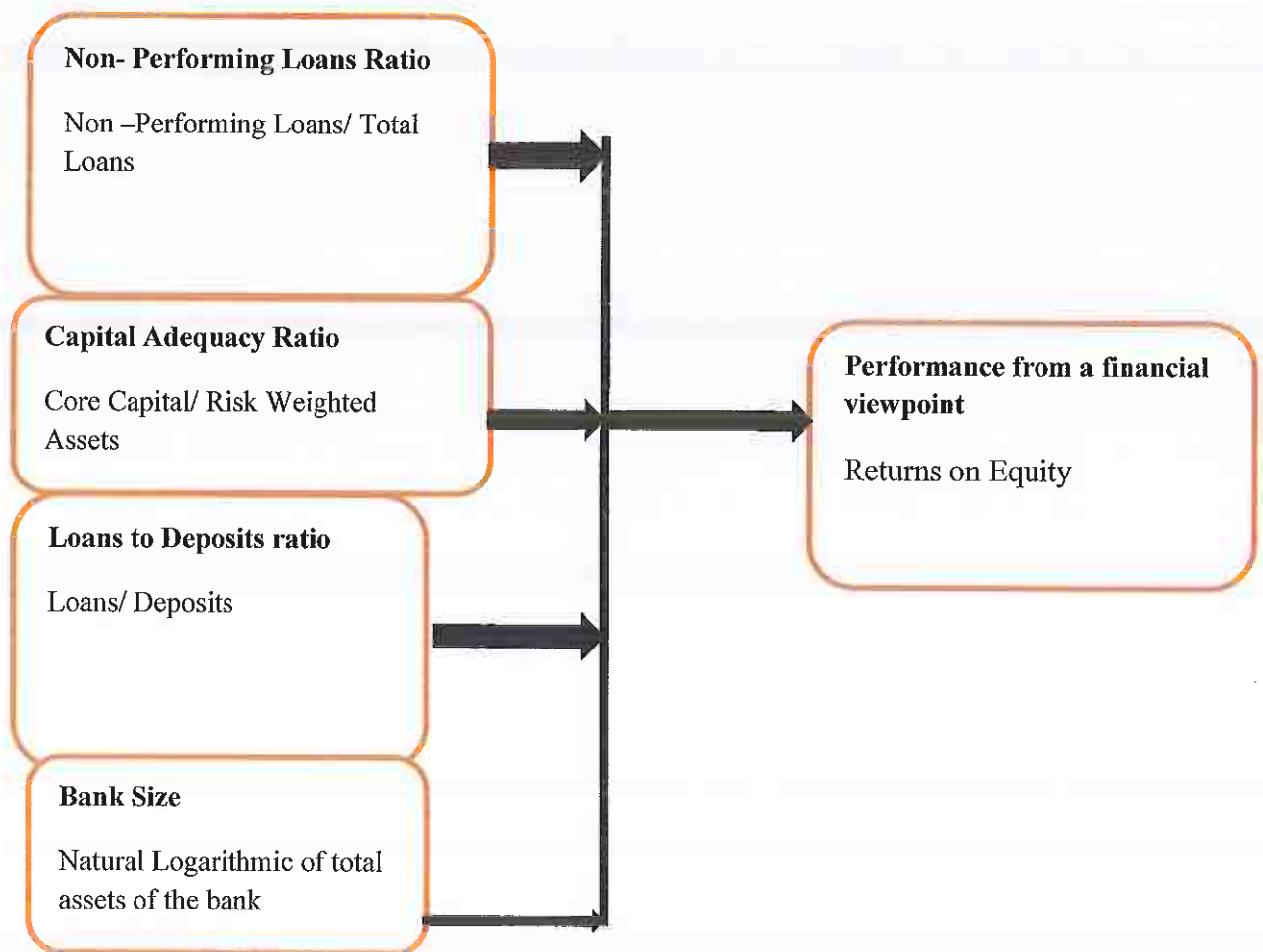


Figure 1:Conceptual Framework

CHAPTER THREE: METHODOLOGY INCORPORATED DURING THE RESEARCH

3.1 Introduction

This chapter covered the following key areas, the design used during the study, the target population, sample technique chosen, how data will be collected, and eventually analysed.

3.2 Research Design

The above was defined in this study as a framework the researcher used to conduct a study (Mugenda & Mugenda, 2003). This study applied descriptive research design since it was the most suitable design type to answer questions on relationship between capital adequacy, non-performing loans, bank size with performance from a financial viewpoint of the banks. The research design was able to define fully the features of each of the variables in the study and answer patient questions such as explaining the general trends of capital adequacy over the last 10 years and the likely trend in the near future.

3.3 Population selected for research

According to Zikmund et al (2011) population comprised all elements with same characteristics. In this study all 42 registered banks were considered as the target population and the data was derived for 10 years. The period under review was from 2011 to 2020. The study was specifically interested to investigate how changing variables affected performance from a financial viewpoint as measured using returns on equity. The dataset in appendix 1.

3.4 Data Collection

Extraction of required data was from Central Bank database for 10 years period on variables on Returns on Equity, CAR, Loans/ deposits, Bank Size and NPLR for commercial banks in Kenya. Data on net income, total assets, owners' equity, total loans, non-performing loans and total deposits will be obtained from the banks' financial statements for the years 2011 to 2020.

3.5 Analysis of the collected data

The data upon its collection was cleaned through removing outliers, and checking for various preliminary data analysis procedures such as tests on stationery, normality tests, multicollinearity and homoscedasticity assumption. Consequently, the researcher will run panel regression model

3.6 Diagnostic tests

3.6.1 Normality Tests

Normality tests is one of the parametric tests' statistics. In this study normality will be tested using Shapiro wilk tests. In testing for normality tests, the research hypothesis that was null emphasized that the population has a distribution that has a normal characteristic. Therefore, if we shall find non-significant where p value $p > 0.05$ we shall conclude that the original dataset used in the study the dependent variable is from a population with normal distribution and therefore the data is suitable for performing inferential tests statistics like running panel data regression model, and correlations. The same tests was checked through the use of graph by the help of the use of histogram fitted with normal curve.

3.6.2 Linearity Test

Tests on linear relationship between dependent variable and any of the predictors are important tests before running any parametric tests statistics. In this study, linearity tests were run by the use of scatter graph and use of p-value tests. In using P-value, the hypothesis to use is the null hypothesis tests data have linear connection between independent and criterion variable.

3.6.3 Testing Homoscedasticity in the data

Tests on whether the variance is the same across the plots, the study used scatter graph. Initial these tests was achieved by stating the null hypothesis that variance was equally distributed and alternative hypothesis that variance was not normally distributed.

3.6.4 Testing Multicollinearity in the data

These tests will be done with the assistance of Variance inflation factor (VIF). If the results exceeding ten this simply meant that the independent variable had a strong relationship and therefore cannot be used in the regression modeling.

3.6.5 Testing Stationarity in the data

This test was done using STATA which was capable for testing whether there were changes of the value of the variable with time. Finally, the researcher was interested to establish if fixed effects were more appropriate than the random effects OLS to detect the absence of no serial correlation among the variables.

3.7 Analytical Model

The regression equation generated thus;

$$ROE = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \mu$$

Where: ROE = Return on Equity

α = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients to regression model

X_1 = NPLR (Non- Performing Loans / Total Loans)

X_2 = CAR (Capital adequacy ratio- core capital / risk weighted assets)

X_3 = LDR (Loans to deposits ratio)

X_4 = Bank size (Natural logarithm of total assets)

μ = error term

3.8 Tests of Significance

In order to perform statistical comparison between the dataset and hypothesis, test of significance was performed. The minimum threshold was 5% for any values less than 5% p-values it was considered significance and anything more than 5% was considered as insignificant.

CHAPTER FOUR: OUTPUT ESTABLISHED, INTERPRETATION AND DISCUSSING OUTCOMES

4.1 Introduction

The chapter covered descriptive examination, time series analysis, diagnostics tests, correlation and multiple linear regression analysis. Major variables in the study included; Non-Performing loans ratio which was quantitatively examined with the aid of non-performing loans and total loans, capital adequacy ratio was quantitatively examined with the aid of core capital/ risk weighted assets, Loans to deposit ratio and Bank Size which was quantitatively examined with the aid of logarithm of total assets.

4.2 Descriptive Statistics

The above was used to analyze the study key variables in order to understand their general characteristics. The study used mean, standard deviation, maximum and minimum to describe each variable and taking note of the sample size in each case where $n = 40$.

Table 4. 1: Statistics linked with Descriptives

Statistics linked with Descriptives					
	N value	Smallest Figures	Largest Figures	Average values	Std. Deviation from the Mean
NPLR	40	.050	.240	.11645	.056602
CAR	40	.190	.220	.20425	.010099
LOANSDEPOSITS	40	.670	.950	.80250	.073441
BANKSIZE	40	9.400	15.200	11.65325	1.890629
ROE	40	.176	.260	.21117	.020196

Source: CBK database (2022)

The results established that non-performing ratio loans out of ($n = 40$, Min = .050, Max = .24, Mean = .11645 and Standard deviation 0.056602). According to Central Bank of Kenya each financial institution is expected to maintain portfolio at risk of below 5 %. This finding simply indicates that for the past 10 years period in analysis Kenya bank average NPL was slightly above the average expected thresholds with average NPL of 11.645 percent and maximum PAR (Portfolio at Risk) of 24 percent.

Capital adequacy in this study was considered as an important variable which determines commercial bank insolvency. The findings established that out of $n = 40$, (Maximum capital

adequacy for commercial banks in Kenya 22 percent and Minimum of 19 percent with, Mean 20.4 percent and standard deviation of 0.02196. This suggests that commercial banks in Kenya for the past 10 years were able to withstand financial downturn. The higher the losses above 19 percent the better the commercial banks able to handle losses before being at risk of insolvency.

The third variable in this survey was the loan-to-deposit ratio (LDR). This ratio is highly meaningful as it was used to assess a bank's liquidity by simply comparing the average total loan amount borrowed by Kenya's commercial banks to the total deposit amount received from customers. If this ratio is too high, it means commercial banks may not have enough liquidity to cover unexpected liabilities. On the other hand, if the ratio is low, it means that commercial banks may not be earning as much as they should. This is a state where assets are not optimized to generate sufficient income for shareholders. However, in this study, the average LDR was 80.25%, the minimum LDR was 67%, and the maximum LDR was 95%. According to the Central Bank of Kenya, the recommended LDR for commercial banks should be in the range of 70-80%. The results therefore show that the trading company has very high liquidity to meet its financial obligations, with an average LDR of 80.25%. Bank size was also considered an important variable in this study. It was measured as the natural logarithm of the total asset value of all commercial banks registered in Kenya. The results reveal that (maximum = 15.2, minimum = 9.4, average bank size = 11.65, standard deviation 1.89). In general, it has been observed that the total assets of Kenyan commercial banks have increased overall over the past decade. The study also examined trends in ROE (return on equity), which is used to measure the performance of commercial banks in Kenya. The result was a minimum

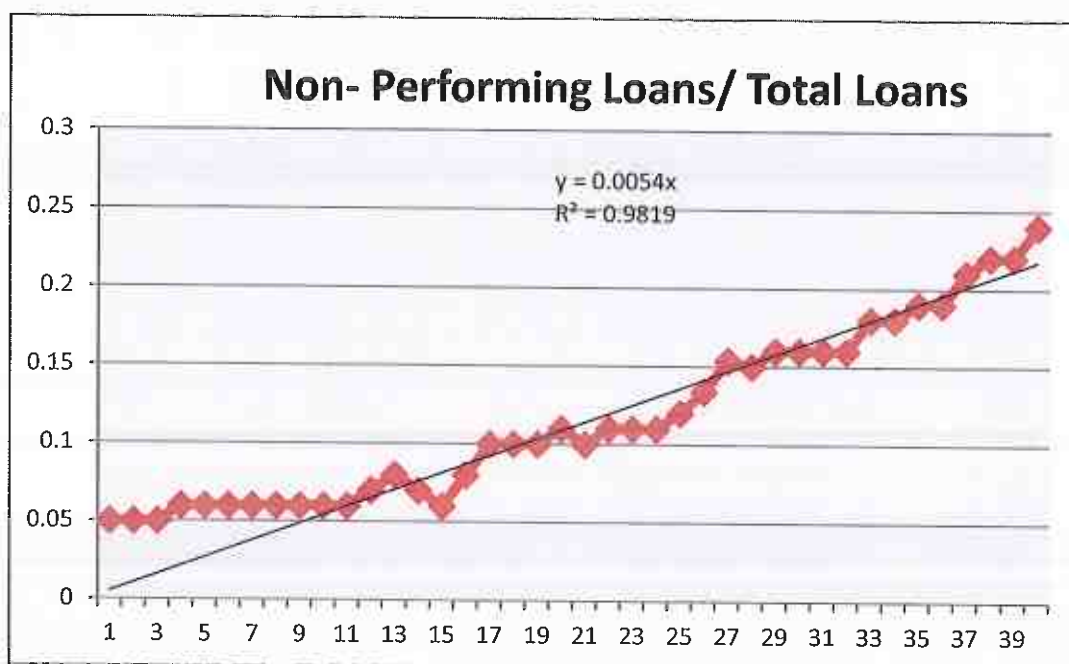
ROE of 0.176, a maximum ROE of 0.26, an average of 0.2112, and a standard deviation of 0.020196.

4.3 Time Series

Time series was used in this study to examine the trends over time for each of the variables in the study this was to support analysis of trend and projection on how each variable expected to move in the future by examining at the estimation equation line and the curve movements over time using the quarterly reports.

4.3.1 Time series for Non-Performing Loans/Total Loans for 2011 to 2021

The study looked at the average industry trends from 2011 to 2021 with regard to non-performing loans over the total loans. In this study portfolio at risk (PAR) was considered as an important credit risk management practice since it affects overall profit for a commercial bank in two perspectives; it reduced net profit by forcing banks to provide for loan losses and it is an expense which subtract directly from profit of commercial banks. The trend presented in figure 2.



Source: CBK database (2022)

Figure 2: Time series for Non-Performing Loans/ Total Loans for 2011 to 2021

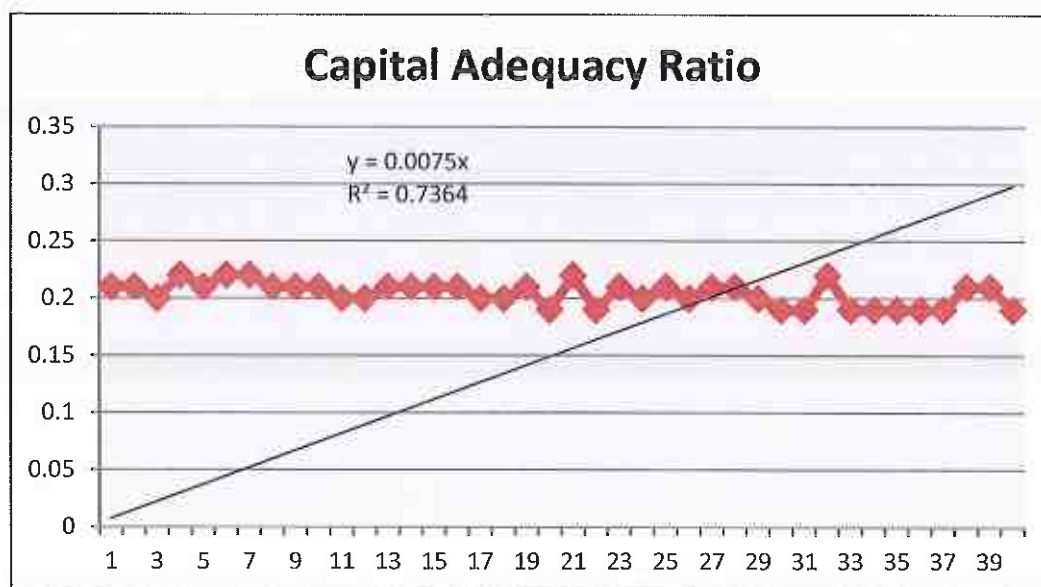
The results showed that from 2011 the trend of non-performing loans has been rising with minimum being slightly above the Central bank mark of 5 percent. In this case the minimum

was 5% witnessed during first quarter in 2011. There was quite variability in PAR especially during 9th quarter and 11th quarter. The trend came downwards. However, the bad macroeconomic variable pushed it further to an increasing trend throughout the period and the peak period began during 2020 impact of Covid 19 which show average Non-Performing loans above 24 percent.

4.3.2 Time series for (CAR) ratio for 2011 to 2021

Capital adequacy reflects the amount of capital a financial institution has kept in store to meet it day to day obligations before it can be declared insolvent. It shows the ability to

Withstand financial downturn, the higher the CAR the better and the lower the CAR the worse off the commercial bank in meeting its financial requirements. Time series graph presented in figure 3 below.



Source: CBK database (2022)

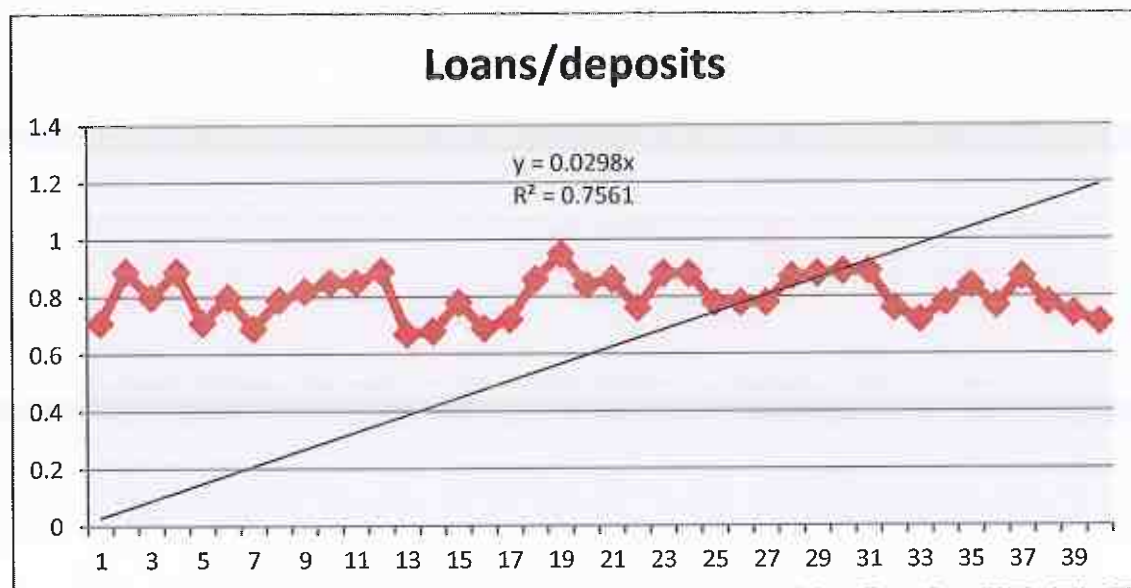
Figure 3: Time series for Capital Adequacy (CAR) ratio for 2011 to 2021

The result showed a time series graph which is rather oscillating between 19 percent to 22 percent but average value being near 19 percent. The trend line for the 10 years period was rather stagnant with minimum changes throughout the year.

4.3.3 Time series for Loans to Deposits (LDR) ratio for 2011 to 2021

A loan to deposit ratio reflects the liquidity position of a financial sector. Assessing the seasonal variation of loans and deposits in this study was considered important since LDR is an indicator of sound management of the financial sector for investors. Sound credit policy

require that financial system have put in place mechanism to raise cheap money from deposits to support its lending decisions as opposed to borrowing money to lend at a higher interest rate. In this study time series was used to analyze the variation of Loans to deposits ratio from 2011 to 2021 in order to understand whether our financial sector is prudently managed and able to raise more revenue for its shareholders. The results presented in figure 4 below.



Source: CBK database (2022)

Figure 4: Time series for Loans to Deposits (LDR) ratio for 2011 to 2021

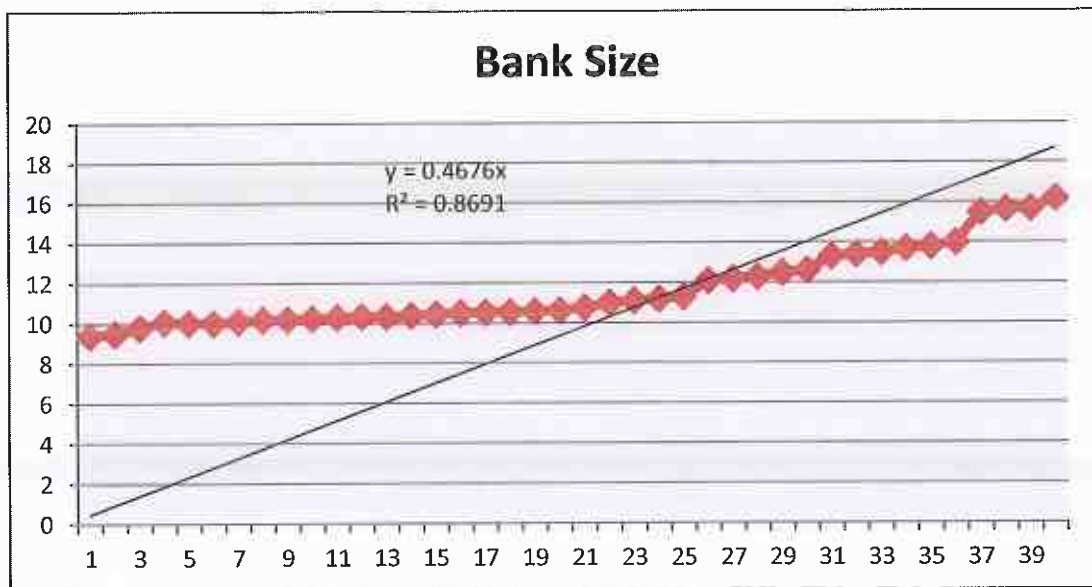
Throughout the 40 quarterly data shows that commercial banks in Kenya have maintained a consistent Loans to deposits ratio between 70% to 95% throughout the 10 years period. The best ideal LDR is supposed to be between 70% to 80%. However, during 2015 on the 3rd quarter the ratio went to 95% recorded as the worst while best moment were towards the close of the year 2020 and 2011. However as can be seen from seasonal variation the changes were consistent and not erratic reflecting a stable operation for commercial banks in Kenya during the 2011 to 2021.

4.3.4 Time series of Banks with Commercial features registered in Kenya size commencing 2011 to 2021

The research looked at seasonal variation over the span of 10 years on bank size. Bank size was measured using natural logarithm of total bank assets in commercial banks in Kenya. The

results presented in figure 5. The result showed that a steady growth of bank size from 2011 to 2021 with values ranging from 9.4 to 15.2 over the period. The banks expanded in branch numbers and hence acquiring greater assets in terms of loans which could generate more revenues.

4.3.4 Time series for Bank Size for 2011 to 2021

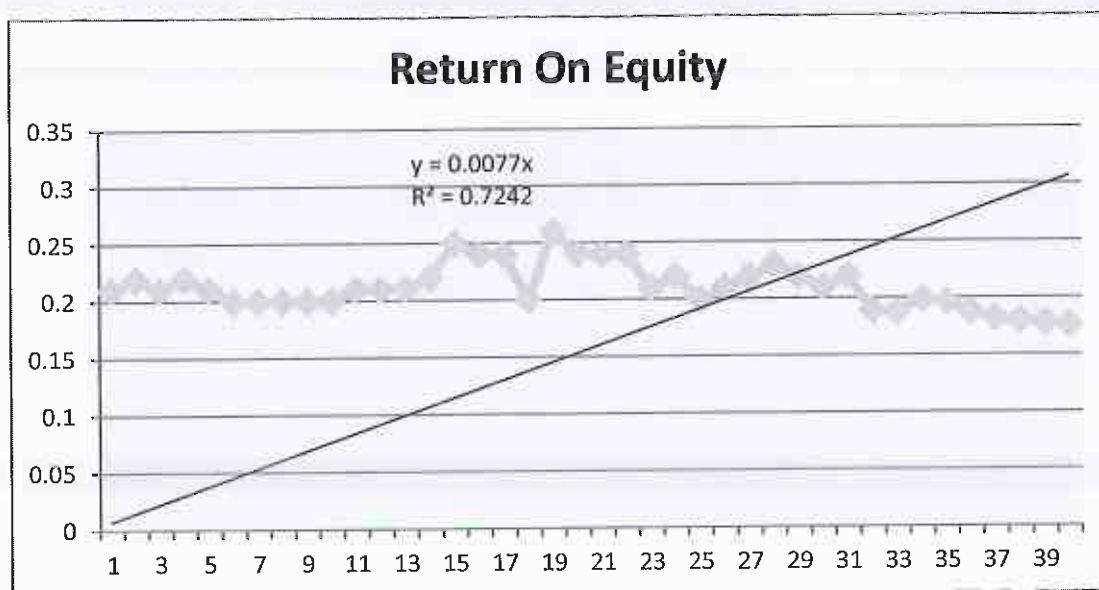


Source: CBK database (2022)

Figure 5: Time series for Bank Size for 2011 to 2021

4.3.5 Time series for Return on Equity (ROE) for 2011 to 2021

The study examined seasonal variation of profitability over the span of 10 years from 2011 to 2021. The results presented in figure 6.



Source: CBK database (2022)

Figure 6: Time series for Return on Equity (ROE) for 2011 to 2021

The results showed a declining trend of Return on Equity due to bad economic time at the end the period due to outbreak of Covid 19 occasioning increased bad loans as so many people lost jobs and businesses performance went down. The profitability curve shows that bank profitability increases but at a decreasing rate towards 2020.

4.4 Diagnostic tests

Diagnostics tests are important procedures performed before running any inferential statistics to increase the level of reliance you can put on tests statistics.

4.4.1 Multicollinearity Tests

This type of tests is performed when you want to know if there is relationship between independent variables themselves which can distort and affect the how fit the model would be. In this analysis, the researcher examined the way NPL ratio, Capital adequacy ratio, Loans to deposits ratio, Bank size correlated.

Table 4. 2: Multicollinearity

Model	Tolerance	Variance inflation factor
NPLR	0.844	2.034
CAR	0.702	1.425
LDR	0.948	1.055

Bank Size	0.747	1.786
Total		6.300

N/B NPLR- Non-performing Loans, CAR- Capital adequacy, LDR- Loans to deposits ratio (LDR)

Source: Central Bank of Kenya Database (2022)

The outcomes in table 4.1 indicate that NPLR (VIF= 2.034), CAR (VIF=1.425), LDR (VIF=1.055), Bank Size = 1.786 showing that all the variables (predictor variables) had VIF (Variance inflation factor) ranging from 1- 10 showing the absence of multicollinearity hence the variables were suitable for multiple linear regression and running correlation.

4.4.2 Linearity

This kind of tests is one of the assumptions for running parametric tests statistics. The expectation is that this test the null hypothesis indicate that the relationship between the two variables is linear. This means that when the significant value is less than 0.05 at 95 percent confidence level then the researcher fails to reject the null hypothesis as displayed in table 4.3.

Table 4. 3:ANOVA for testing linearity between ROE and NPLR

			Sum of Squares	Df	Mean Square	F	Sig.
ROE *	Between Groups	(Combined)	.010	15	.001	2.583	.019
NPLR		Linearity	.004	1	.004	14.271	.001
		deviation from Linearity	.006	14	.000	1.748	.111
	Within Groups		.006	24	.000		
	Total		.016	39			

Central Bank of Kenya of Database (2022)

The null hypothesis H₀: Relationship between ROE and Non –Performing Loans is linear and H₁: Relationship between ROE and Non- Performing Loans is not linear. If the P value < 0.05 conclusion is that the relationship is nonlinear. In this case deviation from linearity P value was non-significant P value > 0.05, P=0.111. Therefore, we fail to reject null hypothesis and conclude that there is linear relationship between Return on Equity and Non-performing Loans ratio.

Table 4. 4: ANOVA for testing linearity between ROE and Capital Adequacy ratio

		Sum of Squares	Df	Mean Square	F	Sig.
ROE * CAR	Between Groups (Combined)	.001	3	.000	.616	.609
	Linearity	.000	1	.000	.672	.418
	Deviation from Linearity	.000	2	.000	.588	.561
	Within Groups	.015	36	.000		
	Total	.016	39			

Source: Central Bank of Kenya database (2022)

The null hypothesis H_0 : Relationship between ROE and Capital adequacy ratio is linear and H_1 : Relationship between ROE and capital adequacy ratio is not linear
In this case P- value was 0.561 therefore we fail to reject null hypothesis.

Table 4. 5:ANOVA for testing linearity between ROE and Loans to deposits ratio

			Sum of Squares	df	Mean Square	F	Sig.
ROE * OANSDEPOSIT S	Between Groups	(Combined)	.006	18	.000	.652	.819
		Linearity	.001	1	.001	1.826	.191
		Deviation from Linearity	.005	17	.000	.583	.869
		Within Groups	.010	21	.000		
		Total	.016	39			

Source: Central Bank of Kenya Database (2022)

The null hypothesis H_0 : Relationship between ROE and Loans to deposits ratio is linear and H_1 : Relationship between ROE and Loans to deposit ratio is not linear.

4.4.3 Homoscedasticity

Homoscedasticity is equal variance across the points. For perfect model fitness in regression analysis, an assumption of homoscedasticity is a requirement. In this example, homoscedasticity was checked through the use of scatter graph to visualize the pattern formed between the dependent variable and independent variable.

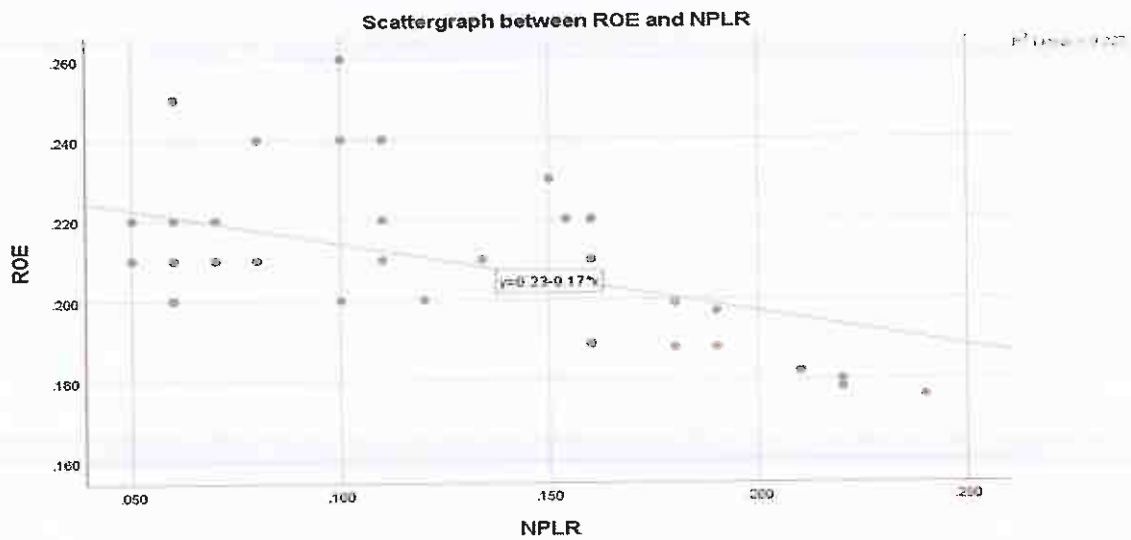


Figure 7: Scatter graph between ROE and NPLR

Source: Central Bank database (2022)

In figure show plots of scatter between ROE and NPLR, homoscedasticity is present when the residuals have identical variance across the predicted variable. This indicates that the dataset met the modeling criteria for multiple linear regression analysis.

Table 4. 6: Augmented Dickey-Fuller Stationarity results

Variables	Level		1 st Difference		Order
	Dicker-Fuller statistic	P-value	Dicker-Fuller statistic	P-value	
ROE	-2.1794	0.5040	-4.0259	0.0223	2
CAR	-3.6250	0.0482	-2.6331	0.3312	2
Loans/Deposits	-3.3100	0.0902	-2.4057	0.0417	2
Bank Size	-3.1885	0.1196	-2.5290	0.0370	2

Source: Author's computation (2022)

Interpretation of the Results

Since the null hypothesis is always set such that the dataset is not stationary, and it should be recalled that the null hypothesis is rejected only when the p-value is less than or equal to the chosen level of significance, which is usually 5%. The findings demonstrate that data sets seem to be stationary throughout, that is, they oscillate about a mean without moving in any particular direction or exhibiting a coherent pattern. However, the data sets for this study in this scenario are entirely stable for the analysis, showing that the stationarity assumption has not in any way been broken.

4.4.4 Normality tests

In running parametric tests statistics, it is usually a requirement that the dependent variable should originate from a population with a normal distribution. Therefore, in this study Return on Equity (ROE) being the dependent variable was tested against the requirement that it meet the condition for normal distribution. In order to meet these criteria, the dependent variable was tested using Shapiro wilk tests and visualized using histogram fitted with normal distribution curve.

Table 4. 7: Normality Tests

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Value	Degree of freedom	Significance value	Value	Degree of freedom	Significance value
NPLR	.145	40	.033	.901	40	.002
CAR	.265	40	.000	.852	40	.000
LOANSDEPOSITS	.120	40	.149	.948	40	.063
BANKSIZE	.206	40	.000	.857	40	.000
ROE	.148	40	.027	.958	40	.139

. Lilliefors Significance Correction

H₀: Null hypothesis population on which dataset was derived is normally distributed. P value was 0.139 therefore the researcher failed to reject the hypothesis identified to be the null one. Therefore, we concluded that the population had normal distribution therefore supporting us to run multiple linear regression and correlation analysis.

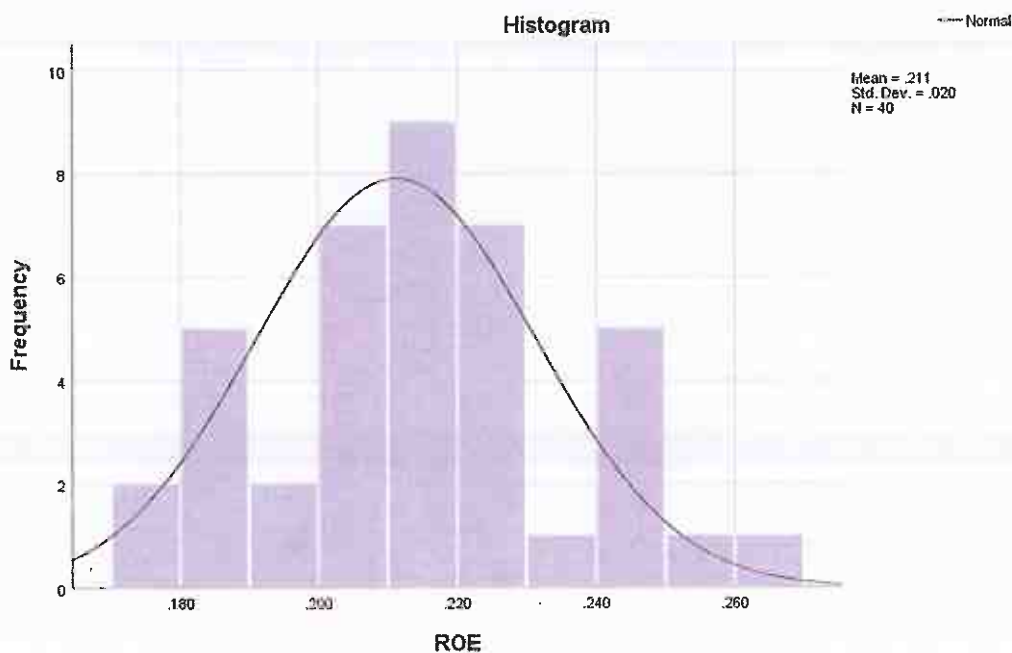


Figure 8 Showing ROE population has normal distribution

4.5 Regression analysis

The analysis above can also be utilized to test hypotheses then assess each independent variable's influence on each dependent variable. In this study, regressions were used to quantitatively assess how commercial banks performed over the 10-year period 2010-2020 for non-performing loans, capital adequacy ratios, lending to depositors, and bank strength between scales.

4.5.1 Model summary

The table below provides a report that shows the strength of the contribution of the independent variables by looking at the correlation.

Table 4. 8:Model Summary

Model	Multiple R value	Value of R Square	adjusted R Square	Standard Error of Estimate	Durbin-Watson
1	.698 ^a	.487		.429	.015268

Predictors: (Constant), BANKSIZE, LOANSDEPOSITS, CAR, NPLR

. Dependent Variable: ROE

In the model summary showed a linear dependence on NPLR, CAR, LDR and bank size. The R value = 0.698 measure the strength of combined correlation on ROE.

R² show coefficient of determination = 0.487 which in actual sense measure the proportion of variance in Return on Equity which is elucidated in the model equation significantly brought changes in the model. Therefore, in this study, 48.7 percent variation in ROE could be explained was caused as a result of presence of NPLR, CAR, LDR and bank size (all the independent variables). At the same time, one could deduce that 51.3 percent variation was as a result to other factors which were not component to the model equation.

4.5.2 Anova

ANOVA is a measure of fitness of the model. We look at the significant value to deduce that the model is fit, its p value is less than 0.05 we conclude that the model is fit for the analysis and the results in the model summary could be relied on for interpretation. Table 4.8 showed that all the predictor variables in this model significantly predicted return on equity (ROE) (4, 39) = 8.311, p = 0.000.

Table 4. 9:ANOVA demonstrating model fitness as per Regression

ANOVA ^a						
Model	Total of Squares	Degrees of freedom	Mean Square values	F value	Significance level	
Based on Regression	.008	4	.002	8.311	.000 ^b	
Based on Residual	.008	35	.000			
Total	.016	39				

. Dependent Variable: ROE

. Predictors: (Constant), BANKSIZE, LOANSDEPOSITS, CAR, NPLR

4.5.3 Regression Coefficient Table

Table 4. 10:Model Coefficient Table

Model		Unstandardized	Standardized	T	Significance	
	B	Standard	Beta Coefficients	Statistical	values	
	Coefficients	Error values		value		
1	(Constant)	.374	.081	4.640	.000	
	NPLR	-.540	.206	-1.514	2.627	.013
	CAR	.117	.189	.003	.024	.002
	LOANSDEPOSITS	.138	.034	.139	1.116	.135
	BANKSIZE	.122	.006	2.045	3.658	.001

The results showed that the non-performing loans ratio had negative effects on the profitability (ROE) determination of Kenya's commercial banks from 2011 to 2020. From the coefficient table it can be interpreted that one unit increase in NPLR decreased profitability by 54% (significant $p=0.013$). This is because nonperforming loans represent the opportunity cost of interest income and, as a provision for nonperforming loans, form part of a bank's expenses which reduces the profitability level of commercial banks.

Second variable examined was capital adequacy. According to the study, Kenyan commercial banks' capital adequacy and profitability are significantly positively correlated. A one-unit increase in capital adequacy ratio (CAR) boosted Kenya's commercial bank profitability by a significant level of 11.7%. This result is similar to the work of Ajayi, Ajayi, Enimola and Orugun (2019) who found a positive and significant association between capital adequacy and profitability of commercial banks in Nigeria.

Our third variable was loan to deposit ratio. The study found that a unit increase in LDR increased the how Kenya's commercial banks attained their profitability by 13.4%, which was not significant. This result is similar to Rengasamy (2014), who examined the relationship between loan-deposit ratio (LDR) and profitability using panel data of Malaysian commercial banks from 2009 to 2013. The results showed a non-significant

positive effect between LDR and ROA. Finally, in the study he used 10-year panel data to analyze how the total assets and profitability of commercial banks are affected by bank size (calculated using the natural logarithm). As a result, he found that when he increased the bank by 1 unit, he increased the profitability of Kenya's commercial banks by 12.2%.

This result is consistent with his Regehr and Sengupta (2016) who found that bank profitability increases as bank size increases. The authors recommend scaling up small community banks to increase profitability. This is because bank size growth is significantly related to commercial bank profitability. Excluding all independent variables, the average profitability level for commercial banks is 0.374, as shown in the constants-coefficients table.

4.5.4 Model fitting Equation

The regression equation was generated as below

$$ROE = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \mu$$

Where: ROE = Return on Equity

α = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients to regression model

X_1 = NPLR (Non- Performing Loans / Total Loans)

X_2 = CAR (Capital adequacy ratio- core capital / risk weighted assets)

X_3 = LDR (Loans to deposits ratio)

X_4 = Bank size (Natural logarithm of total assets)

μ = error term

$$ROE = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \mu$$

$$ROE = 0.374 - 0.54 \text{ NPLR} + 0.117\text{CAR} + 0.138\text{LDR} + 0.122 \text{ Bank Size}$$

CHAPTER FIVE

SYNOPSIS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter covered summary of study findings, conclusion of the study and recommendations. The study established several key findings which would contribute to the banking regulatory best practices. The study also made a number of recommendations for further investigation.

5.2 Summary of the Discoveries

The purpose of the study was to ascertain the impact of techniques associated with managing the risk related to lending finances on performance from a financial viewpoint on Kenyan commercial banks. The study specifically tried to ascertain the effect that non-performing loans, capital adequacy ratios, deposit lending, and bank size have on the Kenyan commercial banks' profitability. The analysis made use of both descriptive and inferential statistics. As a result, the NPL ratio was found to be (n=40, min = 0.050, max = 0.24, mean = 0.11645, standard deviation 0.056602). The CBK expects all financial institutions to maintain a risk portfolio of less than 5%. The results show that the average NPL for Kenyan banks in the last 10 years of analysis is slightly above the average forecast threshold, with an average NPL of 11.645% and a maximum PAR (Portfolio at Risk) of 24%. In this study, capital adequacy was considered an important variable in determining commercial bank failures. The results show n=40 (Kenya's commercial banks have capital adequacy ratios of 22% maximum, 19% minimum, average 20.4%, standard deviation 0.02196). This means that Kenya's commercial banks have posted losses of more than 19% over the past decade, making them more likely to absorb losses before they default. His

third variable in this study was the loan-to-debt ratio (LDR). This ratio is crucial since it is used to evaluate a bank's liquidity by simply comparing the average total amount of loans taken out from Kenya's commercial banks with the total amount of deposits made by clients. In the event that this ratio is very high, commercial banks may not have enough liquidity to handle unforeseen liabilities. On the other hand, a low ratio means that commercial banks may not be making the profits they should. This is a state in which assets are not optimized to generate sufficient returns for shareholders. However, in this study, the average LDR was 80.25%, the minimum LDR was 67%, and the maximum LDR was 95%. According to the Central Bank of Kenya, his LDR recommended for commercial banks should be in the range of 70-80%. The results therefore indicate that the trading company, with an average LDR of 80.25%, has enough cash on hand to pay its debts when they become due. Bank size was also considered a vital research variable. The total assets' natural logarithm of all Kenyan banks that are commercial were calculated and used as the unit of measurement for size. The outcomes show that (maximum = 15.2, minimum = 9.4, mean bank size = 11.65, standard deviation 1.89). In general, we can see that the balance sheet total for operating activities has increased overall over the past decade. Bank of Kenya was several years. The study also examined trends in ROE, which is used to measure how the banks performed financially in Kenya. The result was a least value for ROE of 0.176, a largest value for ROE of 0.26, a mean value of 0.2112, and a standard deviation of 0.020196.

The study found that loans that were assessed to be non-performing had the greatest influence on how Kenya's commercial banks attained their profitability. A one-unit change in

the bad debt variable reduced the return on equity (commercial bank profitability) by 54%.

5.2.2 Impact of Capital Adequacy on Kenyan Commercial Bank Profitability

The study found a positive and significant relationship between capital adequacy and how Kenya's commercial banks attained their profitability. This is because banks with more capital have a higher level of security, so shareholders can easily trust their investments, which makes them more profitable. A commercial bank will be more profitable the greater its capital adequacy ratio. The study found no significant relationship between Kenyan commercial bank deposit/loan ratios and commercial bank profitability from 2011 to 2020, as opposed to borrowed funds, which have interest and costs.

The study discovered a link between Kenyan commercial banks' profitability and bank size. This means that as commercial banks expand in size by opening more branches or opening more lending books, more money is spent on transaction income, interest income, and higher income as a result of foreign transactions. It means that it comes from the commission. forex trading. The second variable found to have a positive impact on the profitability of Kenya's commercial banks was bank size. Size has been found to affect interest income, trading income, and commissions. Finally, the study also showed a modest contribution of capital adequacy ratios to the how Kenya's commercial banks attained their profitability.

5.3 Conclusion

This study found that non-performing loans (NPLs) are the most important variable for managing and effectively managing a bank's profitability. Contribution to earnings was the highest. This is simply due to the strict rules and compliance that all commercial banks in Kenya must strictly follow in order to be profitable by enabling them to effectively implement their lending policies and credit controls. This means central banks need to set requirements. Loan-to-deposit ratios had little to do with the profitability of Kenya's commercial banks. In

contrast, bank size and capital adequacy had a positive impact on the profitability of commercial banks, albeit on a relatively small scale. However, in both cases the relationship was positive and significant for return on equity.

5.4 Study Recommendations

Based on the study's conclusions, the study recommends that central banks should take strict action against commercial banks that violate depositor safety requirements as outlined in Basel 111. To increase capital adequacy for smaller banks, the study recommends that smaller banks should merge with big cooperative societies like STIMA Sacco, Harambee Sacco or join with other small banks to increase their capital adequacy requirements. The study found out that the greatest contribution by looking at beta standardized coefficient was bank size. Therefore, merging small banks to increase their size to generate greater returns on equity was considered the best strategy for Kenya's banks that are commercial.

The research also provides a recommendation that proper training of credit officers and assessment of credibility and character of loan officers during recruitment processes. This was because that loans which were non-performing were found to be the second greatest contributor to increasing profitability of Kenya's banks that are commercial.

The study also recommends strict control procedures around credit appraisal, disbursement and recovery strategies to minimize and ensure total NPLs are below management appetite for risks.

The report also offers commercial banks recommendations in Kenya to put in proper recovery system in place and customers should be told when recovery supposes to be instigated during loan processing and clearly indicated in the letter of offer the steps to recover of assets.

The study recommends that as part of improving NPL, the banks should adopt customer relationship management before any tough actions is taken since selling recovered properties

in Kenya is also a difficult action when proper procedures are followed of valuation and not making any sale below for the property's sale value.

5.5 Ideas for Additional Research

The study makes the following suggestions for further studies

- Another study to be conducted where only Non-Performing Loans with returns on equity and returns on assets used as performance of profitability.
- The study also suggests that a study between bank size and profitability be conducted using secondary and primary data.
- The study suggests another study be conducted using other independent variables like customer relationship management, credit appraisal, credit control onto performance from a financial viewpoint of commercial banks in Kenya.

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Appendix I: Secondary data

QUARTERS	NPLR	CAR	Loans/deposits	Bank Size	ROE
1- year 2011					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
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37					
38					
39					
40-					

Questionnaire Data Calculations

QUARTERS	NPLR	CAR	Loans/deposits	Bank Size	ROE
1	0.05	0.21	0.71	9.4	0.21
2	0.05	0.21	0.89	9.5	0.22
3	0.05	0.2	0.8	9.8	0.21
4	0.06	0.22	0.89	10.07	0.22
5	0.06	0.21	0.71	10.02	0.21
6	0.06	0.22	0.8	10.03	0.2
7	0.06	0.22	0.69	10.1	0.2
8	0.06	0.21	0.79	10.19	0.2
9	0.06	0.21	0.82	10.2	0.2
10	0.06	0.21	0.85	10.25	0.2
11	0.06	0.2	0.85	10.3	0.21
12	0.07	0.2	0.89	10.35	0.21
13	0.08	0.21	0.67	10.35	0.21

14	0.07	0.21	0.68	10.4	0.22
15	0.06	0.21	0.78	10.45	0.25
16	0.08	0.21	0.69	10.52	0.24
17	0.1	0.2	0.72	10.56	0.24
18	0.1	0.2	0.86	10.55	0.2
19	0.1	0.21	0.95	10.6	0.26
20	0.11	0.19	0.84	10.63	0.24
21	0.1	0.22	0.86	10.78	0.24
22	0.11	0.19	0.76	11	0.24
23	0.11	0.21	0.88	11.12	0.21
24	0.11	0.2	0.88	11.2	0.22
25	0.12	0.21	0.78	11.3	0.2
26	0.134	0.2	0.78	12.1	0.21
27	0.154	0.21	0.78	12.2	0.22
28	0.15	0.21	0.87	12.3	0.23
29	0.16	0.2	0.88	12.5	0.22
30	0.16	0.19	0.89	12.6	0.21
31	0.16	0.19	0.89	13.3	0.22
32	0.16	0.22	0.76	13.4	0.189
33	0.18	0.19	0.72	13.5	0.188
34	0.18	0.19	0.78	13.7	0.199
35	0.19	0.19	0.84	13.8	0.197
36	0.19	0.19	0.77	14	0.188
37	0.21	0.19	0.87	15.5	0.182
38	0.22	0.21	0.78	15.66	0.18
39	0.22	0.21	0.74	15.7	0.178
40	0.24	0.19	0.71	16.2	0.176