

**EFFECT OF CREDIT RISK MANAGEMENT ON THE FINANCIAL
PERFORMANCE OF LISTED 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, FACULTY OF BUSINESS AND
MANAGEMENT SCIENCE, UNIVERSITY OF NAIROBI**

NOVEMBER 2022

DECLARATION

I declare that this research project is my own work and has never been presented for any degree or examination in any other University.



Sign.....

Date **12-11-2022**

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D61/7943/2017

This research project has been submitted with my approval as the university supervisor.



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Date 17th November 2022

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ACKNOWLEDGEMENT

This research is a compilation of a meaningful journey characterized by eye opening experiences and discoveries. First and foremost, I wish to thank God Almighty for continued grace and favor that sustained me through my entire academic journey. Secondly, I would wish to sincerely thank my supervisor Dr. Kennedy Okiro for his guidance and direction to complete the project. I appreciate his scholarly effort in enabling me come up with an acceptable quality work. His dedication is not only good for my study but also helpful to my future life and career. I am also very grateful to all the teaching and non-teaching staff at the University of Nairobi, Faculty of business and management sciences for all the assistance they accorded me throughout the study period.

DEDICATION

I wish to dedicate this work to my family for prayers and moral support.

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LIST OF ABBREVIATIONS

APT	Arbitrage Pricing Theory
CBK	Central Bank of Kenya
CMA	Capital markets Authority
CRM	Credit Risk Management
NSE	Nairobi Securities Exchange
ROA	Return on Assets

ABSTRACT

Banks majorly generate their income through giving credits to customers hence credit risk management is crucial to their financial performance. Poor management of the credit risk exposes the bank to huge financial problems. Effective risk management approaches as well as controlling of loan quality are vital components in financial performance of banking industry because they tend to increase profitability. Efficient credit risk management is the essential component since it improves the financial performance. The main research objective was to establish credit risk management effect on financial performance of listed banks in Kenya. The independent variable for the research was credit risk management measured using default rate while the control variables were firm size and liquidity. The dependent variable was financial performance measured using ROA. The research was anchored on modern portfolio theory, credit scoring model and arbitrage pricing theory. Descriptive research design was utilized in this research. The 11 listed banks in Kenya as at December 2021 served as target population. The research obtained secondary data for five years (2017-2021) on an annual basis from CBK and individual listed banks annual reports. Descriptive, correlation as well as regression analysis were undertaken and outcomes presented in tables followed by pertinent interpretation and discussion. The multivariate regression analysis further revealed that individually, default rate displayed a negative significant ROA influence as shown by ($\beta=-0.4911$, $p=0.0000$). Both firm size and liquidity have a positive effect on ROA of listed banks as shown by ($\beta=0.2921$, $p=0.0101$) and ($\beta=0.2342$, $p=0.0203$) respectively. The research recommends listed banks necessity to reduce their credit risk as it adversely affects ROA in a negative way. Further, the research recommends that listed banks improve their liquidity and asset base as this will contribute significantly to their ROA. Future research can focus on other financial institutions in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Commercial banks are very vital for their role in economic growth through credit creation. Commercial banks channels finances and resources from savers to prospective lenders and borrowers who are unable to engage in capital markets. However, credit creation is bound to a wide range of risks to the borrower and the lender. Once the banks extend loans to borrowers, they expose themselves to credit risk. According to Coyle (2010), credit risk is the loss incurred by the bank when the creditors are unwilling or unable to payback what they owe the bank fully and timely. Castro (2013) argues that credit risk is the main cause for failures of financial institutions compared to operational and liquidity risks. Commercial banks must therefore mitigate the risks they are exposed to since any bank losses can trigger huge budget problems hence affecting the economy negatively (Dang, 2011).

This study was guided by modern portfolio theory (Markowitz, 1952), credit scoring model (Huang, 2001) and arbitrage pricing theory developed by Ross (1977). Credit scoring model asserts that every loan selection must have an accompanying investigation of possible risk which serves as a guide for credit selection (Huang, 2001). Arbitrage pricing theory explains the positive link which exists between the asset risk and their expected returns. Modern portfolio theory by Markowitz (1952) posits investors can achieve optimal expected returns by combining different portfolios with given level of portfolio risks. It entails minimization of risks given different levels of returns achieved through optimal proportions of investment funds in different asset categories.

For an efficient credit risk management, the banks have to come up with strategies which would manage the credit lines for their customers. In Kenya, several commercial banks have partnered with other institutions such as credit bureaus to study the customer's credit worthiness before credit appraisal. Failure to assess the risks associated with every credit exposes the banks to huge cashflow challenges leading to receivership. On the other hand,

banks with clear and effective mechanisms to minimize credit risk have shown a competitive advantage with impressive financial performance over the years (CBK, 2020).

1.1.1 Credit Risk Management

CRM entails various practices which are employed to alleviate the losses by gaining an understanding of the capital adequacy of the banking industry (Ferreti, 2017). Credit risk or rather default risk signify a risk that the guaranteed loan and securities in cash flows held by banks is not settled fully by the borrowers. In other words, credit risk is the vulnerability related with borrowers' credit reimbursements. When borrowers' benefit value surpasses their obligation they reimburse loans yet when borrowers' benefit value is not as much as loan qualities, they don't reimburse and they could in this manner exercise their choice to default (Douglas, 2014).

To limit credit risks, commercial banks are urged to utilize the “know your client” guidelines. Information of the Customer implies that Credit will be allowed just to some clients certified by lending institutions to be the ones who comprehend whatever undertakings they do completely. Clients' knowledge must reach out past information identification with the client alone to subjectively and objectively cover all other perspectives which can impact credit risks. The Central Bank of Kenya has provided risk management plan to guide the banks and make a working structure befitting universal prescribed procedures which expect banking sector to possess a completely independent CRM in charge of capital alteration and arrangement for heightening non-performing advances and loans (CBK, 2017). Hence, CRM was gauged by default rate.

1.1.2 Financial Performance

This entails the overall health of finances of a firm over an extended time duration and is often used in comparing businesses within the same sector or across various industries (Berger & De Young, 2016). A company's financial performance depends on how efficiently it uses its resources in order to fulfill its primary function of conducting business and to generate future revenues (Bessis, 2011). Therefore, achieving financial performance is a key goal for businesses, especially profit-driven businesses (Ongore & Kusa, 2013).

The commercial banks' operational policies are quantified in their financial performance. These results are represented in the profitability ratios, liquidity ratios, and gearing metrics of the commercial banks. The majority of corporate entities have traditionally relied on profit as the foundation for their success. However, how well corporate organizations have used money within their operations is the true predictor of business growth. Due to the flaws in the conventional methods, financial experts created profitability ratios to evaluate financial success (Bessis, 2011).

All firms need to exist in a business world to grow and reach new heights. Any entity's level of prosperity typically corresponds to how well it performs financially. Business entities can assess a company's viability by examining its overall monetary production to ascertain how successfully and efficiently it used its resources available for maximization of shareholders' wealth. Businesses can use either current performance metrics or old measures to measure performance in order to gauge their growth and net worth (Ongore & Kusa, 2013). Return on Assets (ROA) was utilized in gauging financial performance.

1.1.3 Credit Risk Management and Financial Performance

As per Achou and Tenguh (2008), the key objective for credit risk management is to alleviate the financial misfortunes brought about by default risk. A few scholars emphatically accept that credit risk management impact the survival and the productivity of the commercial banks since it recognizes the potential factors with a likelihood of influencing them negatively and instead focus on suitable strategies of managing them. One such system is the robust credit analysis which helps in evaluating the credit value of the potential borrowers which will decrease the default risk (Lymon & Carles, 1978).

The modern portfolio theory which was advanced by Markowitz (1952) captures the link between CRM and firms' financial performance by contending that investors can combine various portfolios in order to attain the optimal expected return under a specific level of portfolio risk which will improve the financial performance. The credit scoring model serves as a guide on the assessment of the borrowers as one of the methods for CRM

strategy which fundamentally influences the financial performance. Decision to any credit appraisal should be preceded by a robust analysis of possible risks which would guide the credit decision mechanisms to minimize misfortunes from creditors (Huang, 2001).

Munga (2017) conducted research on how credit risk management affects investment firms' performance in Kenya. He came to the conclusion that CRM significantly improved performance of investment firms. Pattri (2017) explored the link between credit risk and firm value for commercial banks in India. He inferred that credit risk is one of the vital factors determining the success of commercial banks. Mwaluko (2015) in his research resolved that CRM significantly influences financial institutions' performance in Kenya.

1.1.4 Listed Commercial Banks in Kenya

Central bank of Kenya (2020) indicate that Kenya has 42 commercial banks with 10 listed commercial banks. The CBK is tasked with supervision of all Kenyan banking sector while the capital market authority is mandated to oversee the commercial banks operations. All the commercial banks are required to attain certain conditions such as the recommended reserves and liquidity as provided by the Central Bank. The commercial banks have remained resilient despite the backdrop of turbulence in 2017 due to political instability linked to prolonged electioneering period and interest capping. The introduction of credit information sharing systems by commercial banks has bolstered efficiency and competitiveness leading to improved financial performance (CBK, 2020).

Banking sector credit risk management has boosted to its growth and increased market share. These strategies characterize who should get credit and the securities included. Furthermore, it protects its back through protection. Commercial banks embrace various credit risk management strategies depending on; type of bank's management team, administration environment, ownership type, credit scoring framework among others. However, having the best credit management policies does not necessarily mean the bank will show improved financial performance. Banks might be forced to change their credit management policies to be in line with different banks especially where the banks practice herding behavior (CBK, 2020).

1.2 Research Problem

Banks majorly generate their income through giving credits to customers hence credit risk management is crucial to their financial performance. Poor management of the credit risk exposes the bank to huge financial problems (McMenamin, 2009). According to Hempel et. al (2004), effective risk management approaches as well as controlling of loan quality are vital components in financial performance of banking industry because they tend to increase profitability. Efficient credit risk management is the essential component since it improves the financial performance (Patri, (2017).

Kenyan commercial banks have been utilizing the “6 Cs” of credit as an underlying screening and risk evaluation counsel. The Cs include: character, capacity, collateral, capital, control and conductions which have greatly increased the returns for those commercial banks which have fully adopted and implemented the criteria. However, some commercial banks in Kenya's returns have declined as a result of credit risk. This calls for a stronger credit risk management mechanism which are geared towards the improvement of their financial performance (CBK, 2020).

Numerous researches have been conducted in an effort to comprehend the connection between credit risk and firm's performance. CRM had no impact on the value of the firms, according to a Psillak (2017). Drehman (2015) resolved that the firm performance was not impacted substantially by CRM. The profitability of financial sector in the UK from 2010 to 2013 was the subject of a study by Ahmad and Ariff (2016). They resolved that the performance of the financial institutions was impacted substantially by CRM.

Locally, Kanyeke (2017) concluded that CRM had a big impact on how well the financial institutions performed financially. Wachira (2016) resolved that the performance of the investment businesses was not substantially impacted by CRM. CRM possess a positive, substantial impact on performance of the insurance firms, according to Kiio and Mutua's (2013) analysis. According to Mutie (2015), credit risk management significantly impacted

the value of the enterprises in Kenya. Most investigations produced a range of conclusions. However, the main issue with the majority of research is that the research time was short and the sample size was small, which is why the current research was necessary. The current research focused on answering this research question; what is the effect of CRM on financial performance of the listed commercial banks in Kenya.

1.3 Research Objective

The study sought to determine the effect of credit risk management on the financial performance of listed commercial banks in Kenya.

1.4 Value of the Study

Commercial banks will adopt the CRM practices that they should include in their strategy to reduce exposure to credit risks. Future investors interested in investigating further options for managing credit risks will use these insights as a resource.

The results of the study will aid the CMA and other decision-makers in developing the proper systems required to continuously monitor and assess the funding element of firms. This might be done by determining precise industry-based credit thresholds that would make sure businesses aren't exposed to credit risk unnecessarily.

The research will add to the growing literature in this field as a reference on credit risk management studies for academicians interested in probing CRM and firms' financial performance. Researcher ought to contribute to the growing empirical literature on credit risk. It will act as a source of literature.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter captures theories and empirical research on CRM, factors influencing financial performance, a conceptual framework as well as summary of the literature review.

2.2 Theoretical Review

The CRM theories selected are; arbitrage pricing theory (Ross, 1977), credit scoring model (Huang, 2001) and modern portfolio theory (Markowitz, 1952).

2.2.1 Arbitrage Pricing Theory

Ross' (1977) APT theory argues that the risk of an asset has a direct association with its projected return. The theory asserts that investors will always go for higher returns investments as opposed to low returns investment in any market. The theory was developed based on the capital asset pricing model which linearly correlates several variables with returns. The arbitrage pricing model was modified to enable prediction of future returns given several variables which was not possible with the capital asset pricing model.

The APT considers several variables which are represented by beta coefficients highlighting the measure of each individual risk. It is assumed too that other external forces may influence the level of returns but their effects are neutralized by diversification of portfolios developed. According to the arbitrage pricing theory, the investment risks in the market are categorized into diversifiable risks and non-diversifiable risks. Ross (1977) posits that the risks due to external variables are referred to non-diversifiable risks since they cannot be diversified in the market. According to Ross (1977), market behavior is periodically less than completely efficient and causes assets to be mispriced over a small period of time, either overvalued or undervalued. Arbitrage portfolio therefore has zero systematic risk which has the potential effect of improving financial performance.

2.2.2 Credit Scoring Model

According to Huang (2001), credit scoring model is a system employed in the approximation of the probability of default by customers. It implies that when the credit

score is very high, clients are less likely to default and when the score is low, the possibility of default is high. Credit rating approaches likewise develop some portion of the structure utilized by loaning organizations in giving credit to customers. In case of business and corporate borrowers, the strategy is largely subjective even in quantitative areas laying out different parts of the risk including, however not restricted to, working knowledge, management ability, resource quality, leverage as well as liquidity proportions, in that order.

The time this data is evaluated completely by loan officers and credit boards, the bank issues the loan as per the prevailing rules and regulations written in the agreement. It is suggested that all decisions on a loan ought to be done under thorough evaluation of the risks, with the findings serving as a yardstick for making credit decisions (Saunders & Cornett, 2007). Credit score helps banks in doing an evaluation of the repayment capacity. The model is relevant in ensuring assets of the banks are well managed hence lowering credit risk and financial performance is enhanced.

2.2.3 Modern Portfolio Theory

Developed by Markowitz (1952). It illustrates the combinations of various portfolios with different levels of risks by investors to achieve optimal returns. The theory proposes for the minimization of risks associated with different categories of investment capital from various sets of assets. Investors have two options: a low risk portfolio with high returns, or a high expected return. Hicks (1985) asserted that risk and the anticipated return on any financial asset are positively correlated.

Modern portfolio theory further describes the link between undiversifiable risk and expected return for any financial asset. The theory dwells in diversifiable risks which are brought by microeconomic variables as compared to undiversifiable risks which are brought by macroeconomic variables. The specific risks in diversified portfolio can be minimized since they are unsystematic in nature. The macroeconomic variables causing undiversifiable risks are systematic in nature. According to Markowitz (1952), some risks

facing the commercial banks such as default risk can be mitigated by preferring diversified portfolio since its associated with low risks hence improved financial performance.

2.3 Determinants of Financial Performance

The main goals of business organizations are high returns and low expenses; these goals are met through developing effective corporate strategies targeted at enhancing financial performance. In bid to achieve this goal, financial performance is essential. It will put the business's financial strengths and weaknesses to the test. Liquidity, leverage, managerial efficiency and corporate governance are the primary factors of financial performance.

2.3.1 Liquidity

According to Bhandari (1989), liquidity refers to a commercial bank's capacity to pay short-term commitments whenever they fall due. Due to bankruptcy, commercial banks may be subject to liquidity issues. A bank run is a situation in which several customers simultaneously remove money from their deposit accounts and move that funds to other assets out of concern that the respective bank may go bankrupt. Commercial banks may experience severe financial constraints as a result of bank runs, which will eventually have an impact on day-to-day operations. As a result, managing liquidity is an important consideration.

Commercial banks must effectively manage their own liquidity in order to be prepared for financial turmoil or any other crisis. In times of increased liquidity strain, banks will find it easier to meet their obligations when they have more liquid assets, which is regarded as a liquidity cushion. The management of a bank's liquidity is crucial because its financial performance is positively correlated with its assets and liabilities. Customer deposits and bank assets are the two main indicators of a bank's liquidity. The better the bank's financial performance is, the more liquid it is (Bhandari, 1989).

2.3.2 Leverage

Leverage is the debt portion in the company's capital structure, according to (Miller, 1958). A commercial bank with high gearing has a higher proportion of debt than equity in its capital structure. The final value of the commercial bank may be positively or negatively

impacted by the capital mix. Due to the interest tax protection, using indebtedness in capital structures typically increases leverage. The cost of debt remains constant since the inclusion of debts in capital structure does not alter investors' views of risk. High levels of debt typically result in high interest rates, which can negatively impact a business entity's operations and cause financial difficulties. Although there is a belief that higher-risk, higher-return investments would result in higher profitability, which will therefore have a beneficial influence on financial performance, wise use of debt can boost shareholders' returns.

2.3.3 Management Efficiency

Financial performance is influenced substantially by management effectiveness. The efficient use of resources by commercial entities will have a favorable impact on the financial results, which will ultimately affect their profitability. Avoiding resource, financial, and time waste in businesses is the goal of effective management. The growth in earnings can be used to measure management effectiveness. An indication of improving financial success is the growth of net income over time. The ratio of expenses to assets can also be used to gauge management effectiveness. Poor management efficiency is correlated with higher expenses to asset ratios, and vice versa (Gibbs, 2007).

2.3.4 Corporate Governance

It refers to the procedures that mold managers' actions in achieving company objectives. The suggested solutions will aid managers in risk and uncertainty management by aiding in planning, monitoring, and evaluation of overall firm performance. The financial performance of the companies can be enhanced by excellent corporate governance practices. The goal of good corporate governance is to increase the wealth of the company entities' stakeholders, which include its suppliers, creditors, shareholders, and also financial institutions. Additionally, it will guarantee that shareholders' rights are upheld, that they are handled equally, that their rights are upheld, and that management discloses financial results in full (Manne, 1965).

2.4 Empirical Review

Psillak (2017) did a research on CRM impact on the value of the firms in India. His goal was to evaluate if risk of no repayment may lead to credit default. Results uncovered that credit risk emerges when there is a likelihood that the credit given to customers will not be paid back fully and in time hence affecting the cash flow negatively. He inferred that credit risk is viewed as the main risk firms confront and it significantly affects the financial performance.

Ahmad and Ariff (2016) studied effect of CRM on profitability of financial sector in UK from year 2011 to year 2015. The population of the study was 345 financial institutions, 115 financial institutions were analyzed. CRM was obtained by management efficiency and liquidity management whereas financial performance was obtained by ROA. Secondary data was employed while analysis was performed by inferential and descriptive statistics. They concluded that CRM significantly affected the performance of the financial sector.

Hosna (2015) probed the effect of CRM on value of the firms in India whereby the information was gotten from various sectors which included insurance, banking and transportation. 634 firms population were identified for the research with a sample size of 312 firms. The research utilized secondary as well as primary data in the process of analysis as well as utilizing linear regression model. He found that CRM had no substantial effect on performance of the firms.

Drehman (2015) researched on CRM impact on performance of firms in Germany from 2010 to 2014. The population comprised of 500 firms; sample of study was 200 firms. CRM was obtained by firm size, management efficiency and liquidity management whereas financial performance was arrived at by ROA. Secondary data was employed and analysis performed by both inferential and descriptive statistics. He concluded that CRM had no substantial impact on the firms' performance.

Wachira (2016) probed CRM effect on performance of investment firms in Kenya. The research population was 34 investment firms, a sample of 16 firms was selected. Researcher used the secondary data was derived from investment firms' financial statements from 2010 to 2015. He resolved that CRM had a positive substantial influence on performance of investment firms.

Kanye (2017) conducted research on CRM effect on profitability of financial institutions in Kenya from 2010 to 2013. The population of the study was 115 financial institutions, 45 financial institutions were analyzed. CRM was arrived at by performing loans ratio to the non-performing loans (NPL), management efficiency (ME) and liquidity management whereas financial performance was obtained by ROA. Secondary data was selected and analyzed by both inferential and descriptive statistics. He concluded that CRM significantly affected the financial performance of financial sector.

Kiio and Mutua (2013) probed CRM impact on profitability of the commercial banks in Kenya. The principle objective was to see whether the administration of the risks being identified with that credit influences the productivity of the commercial banks. 15 out of 47 commercial banks were randomly selected and data captured through questionnaires. They found that credit risk administration in commercial banks has turned out to be more vital especially during economic crisis. They concluded that CRM had a positive impact on profitability.

Mutie (2015) probed CRM effect on value of the firm in Kenya. A total population of 64 listed at NSE were selected as the population. This research used both primary data and secondary data in analysis and utilized linear regression technique. He resolved that CRM had a substantial impact on the firm value in Kenya.

2.5 Conceptual Framework

CRM is the independent variable arrived at by default rate because they expose commercial banks to credit risks, control variables were measured by bank size and liquidity and dependent variable was financial performance which was gauged by ROA.

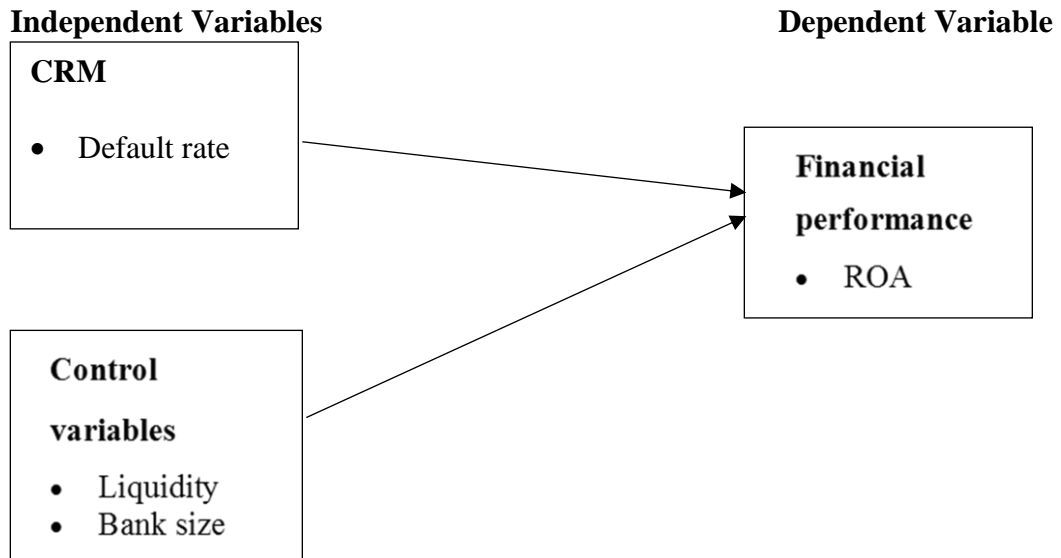


Figure 2.1: Conceptual Framework

2.6 Summary of Literature Review

The theories discussed include, arbitrage pricing theory (Ross, 1977), credit scoring model (Huang, 2001) and modern portfolio theory (Markowitz, 1952). The determinants of financial performance deliberated were, liquidity, leverage, management efficiency and corporate governance. Various studies on credit risk management were highlighted including; Psillak (2017), Ahmad & Ariff (2016), Hosna (2015), Drehman (2015), Wachira (2016), Kanyeke (2017), Kiiro and Mutua (2013) and Mutie (2015). The conceptual framework was also discussed in this chapter. As per the reviewed literature, study periods in some researches were short and in others their sample sizes were very small. Therefore, the current research on the impact of CRM on listed commercial banks financial performance in Kenya attempted to fill the gaps mentioned above.

Table 2.1 Summary of Literature

Author	Focus of Study	Methodology	Findings	Research Gaps
Psillak (2017)	Effect of credit risk management on the value of the investment firms in India.	Linear regression model	CRM had a significant influence on the performance of the investment firms.	The study period was short.
Ahmad and Ariff (2016)	Effect of CRM on the profitability of financial institutions in United Kingdom	Inferential and descriptive statistics	CRM substantially affected the financial performance of the financial institutions	Short study period
Hosna (2015)	Effect of CRM on the value of the firms in India	Linear Regression model utilized	CRM had no significant influence on the value of the firm's performance of the firms.	Sample size was limited
Drehman (2015)	Effect of CRM on performance of firms in Germany.	Inferential and descriptive statistics	CRM had no significant influence on the performance of the firms.	Study period was limited.
Wachira (2016)	Effect of CRM on performance of investment firms in Kenya.	No model specified	CRM had a positive substantial influence on the performance of the investment firms	Shorter time period used.
Kanyeale (2017)	Effect of CRM on profitability of financial institutions in Kenya	Inferential and descriptive statistics	CRM substantially affected the financial performance of the financial institutions.	Criteria for firm selection were not elaborated.
Kiio and Mutua (2013)	effect of CRM on profitability of Kenyan commercial banks.	No model specified	CRM had a positive influence on the profitability	No model specified
Mutie (2015)	Effect of CRM on value of the Kenyan firms.	Linear regression model	CRM had a substantial impact on the value of the firms in Kenya.	Shorter time period used.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter explores research design, research population, collection of data, diagnostic tests for data, and eventually how data analysis was performed.

3.2 Research Design

This is the layout of the steps and procedures chosen by whoever is carrying out a research for assessing the link between the variables of the study (Khan, 2008). Descriptive research design was utilized. The research design shows the framework of the research which is the plan of action.

3.3 Population of the Study

Population of a study involves all the observations that a researcher has interest in it. These could be events or even people (Burns & Burns, 2008). For this case it comprised all the 11 listed commercial banks according to CBK (2021). A census was conducted.

3.4 Data Collection

The current research dwelled on secondary data that was gotten from KNBS, capital markets authority (CMA) and CBK from the year 2017 to the year 2021 due to secondary data availability. Data that was obtained comprised total assets, net income, total loans, non-performing loans and total customer deposit.

3.5 Diagnostic Tests

This study undertook multicollinearity, homoscedasticity, autocorrelation, normality and stationarity tests. The normality assumption establishes how likely it is that the data set is distributed normally and was assessed using the Shapiro Wilk test. Multicollinearity is the occurrence of high correlations between two or several explanatory variables in a regression model, and the variance inflation factors (VIF) was utilized in testing for multicollinearity. The assumption of homoscedasticity states that the errors in the term defects should be the same for the values of the independent variables and that the Breusch-

Pagan test was used to check for similarity. Autocorrelation occurs when the error members of a pair of observations are not independent and are evaluated using Durbin-Watson test. The stability test, which evaluates whether a time series data set is not stationary and has a unit root, was evaluated using the Levin-Lin Chu test.

3.6 Data Analysis

The needed analysis on data was performed using correlation and regression. SPSS was used for this purpose. Correlation test studied the variation (joint) of the variables to establish the extent of correlation between them while the regression analysis established the statistical relation of the variables.

3.6.1 Analytical Model

To aid in getting the link of the variables, a linear regression model was utilized. The below is the equation that was employed:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where: Y = Financial performance as given by return on assets.

β_0 = free term

$\beta_1 \dots \beta_3$ = coefficients of predictor variables

X_1 = default rate calculated by non-performing loans to total loans

X_2 = Liquidity calculated by total loans to customer deposits

X_3 = Firm size as given by total assets

ε = error term

3.6.2 Test of Significance

The 'F' and 't' tests were utilized. This was done at confidence level of 95%. The F statistics was employed to determine whether the equation used in regression would still have applied if the hypothesis was null, whereas the t statistics was utilized in assessing the same for the study coefficients.

CHAPTER FOUR

DATA ANALYSIS RESULTS AND FINDINGS

4.1 Introduction

This chapter offers descriptive statistics and the results and interpretations of various tests namely; test of normality, Multicollinearity, heteroskedasticity tests, autocorrelation and stationarity test. The chapter also presents the results of Pearson correlation and regression analysis.

4.2 Descriptive Statistics

This segment offers the descriptive findings from the collected data. The descriptive results include mean and standard deviation for every research variable. The analyzed data was acquired in distinct listed banks annual reports for duration of 5 years (2017 to 2021). The number of observations is 55 (11*5) as 11 listed banks provided complete data for the 5 year period. In Table 4.1 outcomes are exhibited.

Table 4.1: Descriptive Results

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	55	-.009	.040	.02375	.011743
Default rate	55	.0116	.5650	.094124	.1047837
Liquidity	55	.2578	.3180	.273220	.0126670
Firm size	55	12.387	16.404	14.57438	1.062366
Valid N (listwise)	55				

Source: Field data (2022)

4.3 Diagnostic Tests

As rationalised in chapter three, the researcher steered diagnostic tests to ensure that the assumptions of Classic Linear Regression Model (CLRM) are not violated and to attain the suitable models for probing in the significance that the CLRM hypotheses are infringed. As a result, pre-approximation and post-approximation assessments of the regression model were performed prior to processing. The multicollinearity test and unit root test were the pre-approximation tests used in these situations, whereas the normality test, test for heteroskedasticity, and test for autocorrelation were the post-estimation tests.

4.3.1 Normality Test

The data normality can be tested using a variety of methods. The most commonly utilized approaches include the Shapiro–Wilk test, Kolmogorov–Smirnov test, skewness, kurtosis, histogram, mean and standard deviation. The most extensively used normality tests are the Kolmogorov–Smirnov test and the Shapiro–Wilk test. The research utilized the Kolmogorov–Smirnov test as the numerical method of determining normality. For the tests above, the null hypothesis says that the data are obtained from a normal distribution population. When P-value is below 0.05, null hypothesis is rejected and the data are said to lack normal distribution.

Table 4.2: Test for Normality

	Kolmogorov-Smirnov	P-value
ROA	0.874	0.091
Default rate	0.892	0.101
Liquidity	0.923	0.120
Firm size	0.874	0.194

Source: Research Conclusions (2022)

Evident in Table 4.2 results, all the study variables have a p value above 0.05 and therefore possess normal distribution.

4.3.2 Multicollinearity Test

Multicollinearity transpires when the regression model independent variables are significantly linked. Multicollinearity was assessed using the VIF and tolerance indices. If the VIF value is above ten and the tolerance score is below 0.2, multicollinearity is present, and the assumption is broken. The VIF values are below 10, indicating no problem with multicollinearity.

Table 4.3: Multicollinearity

	Collinearity Statistics	
Variable	Tolerance	VIF
Default rate	0.726	1.377
Firm size	0.614	1.629
Liquidity	0.693	1.443

Source: Research Findings (2022)

4.3.3 Heteroskedasticity Test

The residual variance from the model must be constant and unrelated to the independent variable in linear regression models calculated using the Ordinary Least Squares (OLS) method(s). The research utilized the Breusch-Pagan/Cook-Weisberg test to check if the variation was heteroskedastic. The null hypothesis implies constant variance, indicating that the data is homoscedastic. The outcomes are offered in Table 4.4.

Table 4.4: Heteroskedasticity Results

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity		
chi2(1)	=	0.8291
Prob > chi2	=	0.6226

Source: Research Findings (2022)

As evident in Table 4.4 null hypothesis was not rejected owing to the 0.6226 p-value, which was statistically significant ($p > 0.05$). As a result, the dataset had homoskedastic variances since the P-values of Breusch-Pagan's test for homogeneity of variances above 0.05. The test thus confirmed homogeneity of variance. The data can therefore be used to conduct panel regression analysis.

4.3.4 Autocorrelation Test

Serial correlation, also known as autocorrelation, makes the standard errors of coefficients appear to be less than in linear panel data models, resulting in higher R-squared and erroneous hypothesis testing. Autocorrelation was verified via Durbin-Watson test. If the Durbin-Watson test results in a value of 2, the error terms of regression variables are uncorrelated (i.e. between 1 and 3). The nearer the figure to 2 is; the better. Table 4.5 presents the results.

Table 4.5: Test of Autocorrelation

Durbin Watson Statistic
1.982

Source: Research Findings (2022)

The Durbin-Watson statistic was 1.982, according to Table 4.5 results. The fact that the Durbin-Watson statistic was near to 2 demonstrates that the error terms of regression variables are uncorrelated.

4.3.5 Stationarity Test

The research variables were subjected to a panel data unit-root test to establish if the data was stationary. The unit root test was Levin-Lin Chu unit root test. At a standard statistical significance level of 5%, the test was compared to their corresponding p-values. In the test, the null hypothesis is that every panel has a unit root, and the alternative hypothesis is that at least one panel is stationary. Table 4.6 includes the results of the Levin-Lin Chu unit root test.

Table 4.6: Levin-Lin Chu unit-root test

Levin-Lin Chu unit-root test			
Variable	Statistic	p value	Comment
ROA	6.7723	0.0000	Stationary
Default rate	7.6976	0.0000	Stationary
Liquidity	6.5126	0.0000	Stationary
Firm size	8.5097	0.0000	Stationary

Source: Research Findings (2022)

As Table 4.6 demonstrated, this test concludes that the data is stationary at a 5% statistical significance level since the p-values all fall below 0.05.

4.3.6 Hausman Test

When using panel data, it is essential to establish if a fixed effect or random effect model is more desirable. For the purpose of choosing the best panel regression model, the Hausman specification test was used. In essence, a Hausman specification test determines if the unique errors have a relationship to the regressors, with the null hypothesis being that they do not (random effect is preferred). In Table 4.7, the Hausman test's results are presented.

Table 4.7: Hausman Test Results

chi2(3)	P-Value
23.94	0.0000

Null Hypothesis: The appropriate model is Fixed Effects

Source: Research Findings (2022)

4.4 Correlation Results

To determine the degree and direction of link between each predictor variable and the response variable, correlation analysis was carried out. The correlation findings in Table 4.8 display correlation nature between the research variables in relation to magnitude and direction. The outcomes disclose that default rate and ROA have a negative as well as significant correlation ($r=-0.632$) at 5 % significance level. Liquidity has a moderate positive as well as significant link with ROA of listed banks ($r=0.420$) at 5% significance level. The outcomes also reveal that firm size had positive as well as significant relation with ROA of listed banks as depicted by ($r=0.503$) and a p value below 0.05.

Table 4.8: Correlation Results

		ROA	Default rate	Liquidity	Firm size
ROA	Pearson Correlation	1			
	Sig. (2-tailed)				
Default rate	Pearson Correlation	-.632**	1		
	Sig. (2-tailed)	.000			
Liquidity	Pearson Correlation	.420**	-.189	1	
	Sig. (2-tailed)	.001	.168		
Firm size	Pearson Correlation	.503**	-.274*	.170	1
	Sig. (2-tailed)	.000	.043	.215	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=55

Source: Research Findings (2022)

4.5 Regression Results

Regression analysis was used to examine how well the selected factors described the performance of listed banks. In Table 4.9, the regression's findings were displayed. From the conclusions as epitomized by the adjusted R², the studied independent variables described variations of 0.5880 of ROA of listed banks in Kenya. This suggests that other factors not studied account for 41.2% of the variability in ROA of banks in Kenya, while the three variables account for 58.8% of those variations.

The data possessed a 0.000 significance level, according to Table 4.9's ANOVA results, that suggests that the model is the best choice for drawing conclusions pertaining the variables.

Table 4.9: Regression Results

ROA	Coef.	Std. Err.	P>t
Default rate	-0.4911*	0.0110	0.0000
Firm size	0.2921*	0.0010	0.0101
Liquidity	0.2342*	0.0563	0.0203
_cons	-0.5423*	0.0732	0.0000
Model Summary			
R-squared	0.5880		
F(3, 54)	24.248		
Prob > F	0.0000		
Observations	55		
ID	11		

* p<0.05

Source: Research Findings (2022)

The regression model's coefficient was as follows;

$$Y = -0.5423 - 0.4911X_2 + 0.2921X_3 + 0.2342X_4$$

Where:

Y = ROA; X₁=Default rate; X₂= Firm size; X₃ = Liquidity

4.6 Discussion of Research Findings

The research objective was establishing credit risk management effect on ROA of listed banks in Kenya. The research applied a descriptive design whereas population was the 11

listed banks in Kenya. Complete data was acquired from all the 11 listed banks in Kenya and which were considered adequate for regression analysis. The research applied secondary data that was acquired from CBK and individual listed banks annual statements. The independent variable was credit risk management measured using default rate whereas the control variables were; firm size and liquidity. Descriptive as well as inferential statistics were useful in examining the data. This section discusses the conclusions.

The correlation results disclose that default rate and ROA have a negative as well as significant correlation at 5 % significance level. Liquidity has a moderate positive as well as significant link with ROA of listed banks at 5% significance level. The outcomes also expose that firm size had positive as well as significant relation with ROA of listed banks.

Multivariate regression outcomes revealed that the 0.5880 R square inferring 58.8% of changes in performance of listed banks are due to the three variables alterations selected for this study. This means that variables not considered explain 41.2% of changes in ROA. The overall model was also statistically significant as the p value was 0.000 that is below the 0.05 significance level. This infers that the overall model had the required goodness of fit.

The multivariate regression analysis further revealed that individually, default rate displayed a negative and significant ROA influence as shown by ($\beta=-0.4911$, $p=0.0000$). Both firm size and liquidity have a positive effect on ROA of listed banks as shown by ($\beta=0.2921$, $p=0.0101$) and ($\beta=0.2342$, $p=0.0203$) correspondingly.

These conclusions concur with Psillak (2017) who did a research on effect of CRM on the value of the firms in India. His goal was to evaluate if risk of no repayment may lead to credit default. Results uncovered that credit risk emerges when there is a likelihood that the credit given to customers will not be paid back fully and in time hence affecting the cashflow negatively. He inferred that credit risk is viewed as the main risk firms confront and it significantly affects the financial performance.

The research findings also concur with Ahmad and Ariff (2016) who studied effect of CRM on profitability of financial sector in UK from year 2011 to year 2015. The population of

the study was 345 financial institutions, 115 financial institutions were analyzed. CRM was obtained by management efficiency and liquidity management while financial performance was obtained by ROA. Secondary data was employed whereas analysis was done by inferential and descriptive statistics. They concluded that CRM significantly affected the performance of the financial sector.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The key aim of the research was determining how credit risk management influences the financial performance of listed banks in Kenya. This section includes a summary of the findings from the previous chapter as well as the conclusions and limitations of the study. Furthermore, it makes recommendations for potential policy makers. The chapter provides recommendations for further research.

5.2 Summary of Findings

The research objective was to assess how credit risk management influences ROA of listed banks in Kenya. The research applied a descriptive design whereas population was the 11 listed banks in Kenya. Complete data was acquired from all the 11 listed banks in Kenya and which were considered adequate for regression analysis. The research applied secondary data which was acquired from CBK and individual listed banks annual statements. The independent variable was credit risk management measured using default rate whereas the control variables were; firm size and liquidity. Both descriptive as well as inferential statistics were useful in examining the data. This section discusses the findings.

The correlation results disclose that default rate and ROA have a negative as well as significant correlation at 5 % significance level. Liquidity has a moderate positive as well as significant link with ROA of listed banks at 5% significance level. The outcomes also discover firm size had positive as well as significant relation with ROA of listed banks.

Multivariate regression outcomes revealed that the 0.5880 R square inferring that 58.8% of changes in performance of listed banks are due to the three variables alterations selected for this study. This means that variables not considered explain 41.2% of changes in ROA. The overall model was too statistically significant as the 0.000 p value that is below the 0.05 significance level. This infers that the overall model had the required goodness of fit. The multivariate regression analysis further revealed that individually, default rate displayed a negative significant ROA influence as shown by ($\beta = -0.4911$, $p = 0.0000$). Both

firm size and liquidity possess a positive effect on ROA of listed banks as shown by ($\beta=0.2921$, $p=0.0101$) and ($\beta=0.2342$, $p=0.0203$) correspondingly.

5.3 Conclusions

The research intention was establishing correlation between credit risk management and Kenyan listed banks ROA. The conclusions confirmed that default rate possessed a negative significant effect on ROA of listed banks. This may imply that listed banks with high credit risk have low levels of ROA. This can be clarified by the sense that a rise in credit risk implies reduction in interest income which negatively impact the ROA of listed banks.

The research outcomes further depicted that firm size exhibited a positive as well as significant influence on ROA that is likely to mean that an increase in asset base of a listed bank leads to enhanced ROA. This can be clarified by the fact that listed banks possessing more assets are likely to have developed structures to monitor the internal operations of a firm leading to better ROA. Bigger listed banks are also likely to have better governance structure which can also explain the high ROA associated with firm size.

The study conclusions revealed that liquidity possess positive significant impact on ROA. This might indicate that the listed banks that have adequate liquidity are capable of meeting their obligations when they fall due and are also able to undertake investment opportunities that might arise in the course of doing business and therefore high levels of ROA compared with firms that has less liquidity.

5.4 Recommendations for Policy and Practice

The research results indicate that default rate significantly and negatively affected ROA. Hence, the research recommends that listed banks administrators should endeavor to lower the amount of non-performing loans. This can be accomplished by developing efficient ways for managing credit risk that will allow the listed banks to discriminate between creditworthy and non-creditworthy borrowers.

From the study findings, liquidity was found to enhance ROA of listed banks, this research recommending that listed banks should keep adequate liquidity levels to sustain their obligations when they fall due whereas simultaneously time enjoying short term investment chances which may arise. The policy makers ought to set a limit of the liquidity level that listed banks should have as too much liquidity is also disadvantageous as it comes with opportunity costs.

The research findings revealed that firm size has a positive significant impact on the ROA of a bank. The research recommends the need for management of the commercial banks and policy makers in the banking industry should come up with policies guiding the banks on how to manage their assets as this will go a long way in enhancing their financial performance.

5.5 Limitations of the Study

The focus was on various factors which are believed to influence ROA of Kenyan listed banks. The research specifically examined three explanatory factors. Though, in certainty, there is presence of other variables probable to influence ROA of firms including internal like corporate governance attributes and managerial efficiency whereas others are beyond the control of the firm like interest rates as well as political stability.

In this research, five-year duration from 2017 to 2021 was selected. There is no evidence that comparable results will replicate across a long-time frame. Moreover, it is impossible to predict if the same outcomes would persist until 2021. Given that additional time contains instances of big economic transitions like recessions and booms, it is more dependable.

The data quality was the main restriction for this research. It is impossible to conclusively conclude that the study's findings accurately reflect the current reality. It's presumed that the data utilized in the study are accurate. Due to the current conditions, there has also been a great deal of incoherence in the data measurement. The research utilized secondary data

rather than primary data. Owing to the constrained data availability, only some of the growth drivers have been considered.

The data analysis was performed using regression models. Owing to the limitations associated with using the model, like inaccurate or erroneous findings, the researcher would not be able to generalize the conclusions precisely. A regression model cannot be performed using the prior model after data is added to it.

5.6 Suggestions for Further Research

It is suggested that several areas for advanced future research to be done on the basis of the tangible information gathered and the clarifying comprehension established in this research. First, other credit risk management aspects influence firm ROA apart from the three selected for this study. More research can be conducted to determine and evaluate them. Additionally, other factors moderate, intervene, or mediate the relationship between credit risk management and firm ROA apart from firm size, default rate and liquidity. It is possible to locate and examine them with additional research.

The current research scope was restricted to five years; more research can be performed past five years to determine whether the results might persist. Thus, inherent future studies may use a wider time span, which can either support or criticize the current research conclusions. The scope of the study was additionally constrained in terms of context where listed banks were examined. Further studies can be extended to other financial firms to establish if they complement or contradict the current study findings. Researchers in the East African region, the rest of Africa, and other global jurisdictions can too perform the research in these jurisdictions to ascertain if the current research conclusions would persist. The research only used secondary data; alternate research may use primary data sources such as in-depth questionnaires and structured interviews given to practitioners and stakeholders. These can then affirm or criticize the results of the current research. This research used multiple linear regression as well as correlation analysis; future research could use other analytic techniques such factor analysis, cluster analysis, granger causality, discriminant analysis, and descriptive statistics, among others.

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APPENDICES

Appendix I: List of Commercial Banks Listed at NSE

1	Absa Bank
2	Stanbic Bank
3	Co-operative Bank
4	Diamond Trust Bank
5	Equity Bank
6	Housing Finance
7	I&M Bank
8	Kenya Commercial Bank
9	NCBA Bank
10	Standard Chartered Bank
11	National Bank of Kenya

Appendix II: Research Data

Bank	ID	Year	ROA	Default rate	Liquidity	Firm size
ABSA	1	2017	0.035	0.0363	0.2727	15.332
	1	2018	0.028	0.0267	0.2686	13.573
	1	2019	0.026	0.0521	0.2669	14.286
	1	2020	0.023	0.0556	0.2679	14.465
	1	2021	0.020	0.0610	0.2662	14.998
Cooperative bank	2	2017	0.034	0.0427	0.2711	13.758
	2	2018	0.036	0.0334	0.2768	15.034
	2	2019	0.029	0.0428	0.2768	15.011
	2	2020	0.031	0.0702	0.2755	15.578
	2	2021	0.031	0.1027	0.2741	16.112
Diamond Trust Bank	3	2017	0.024	0.0116	0.2621	14.473
	3	2018	0.024	0.0241	0.2620	14.276
	3	2019	0.019	0.0325	0.2698	14.288
	3	2020	0.019	0.0666	0.2696	15.268
	3	2021	0.019	0.0629	0.2683	15.616
Equity Bank	4	2017	0.040	0.0401	0.3180	14.426
	4	2018	0.035	0.0326	0.3141	15.198
	4	2019	0.036	0.0782	0.3119	15.635
	4	2020	0.035	0.0691	0.3113	14.631
	4	2021	0.036	0.0983	0.2689	15.810
HF Group	5	2017	0.017	0.0715	0.2730	12.438
	5	2018	0.013	0.0658	0.2710	12.652
	5	2019	0.002	0.0950	0.2703	13.478
	5	2020	0.010	0.1400	0.2694	12.387
	5	2021	0.002	0.2428	0.2731	13.474
I&M Bank	6	2017	0.037	0.0157	0.2804	14.836
	6	2018	0.037	0.0400	0.2790	14.657
	6	2019	0.030	0.0568	0.2742	15.143
	6	2020	0.026	0.1280	0.2807	15.496
	6	2021	0.033	0.1204	0.2742	16.198
KCB	7	2017	0.035	0.0465	0.2645	16.404
	7	2018	0.033	0.0528	0.2617	16.372
	7	2019	0.030	0.0682	0.2718	13.149
	7	2020	0.034	0.0758	0.2668	13.172
	7	2021	0.028	0.0628	0.2659	14.291
National Bank of Kenya	8	2017	-0.009	0.1074	0.2604	13.473
	8	2018	0.001	0.1469	0.2584	13.262

Bank	ID	Year	ROA	Default rate	Liquidity	Firm size
	8	2019	0.007	0.4511	0.2578	13.123
	8	2020	-0.001	0.4560	0.2582	13.795
	8	2021	-0.008	0.5650	0.2763	13.178
NCBA	9	2017	0.030	0.0132	0.2710	12.968
	9	2018	0.017	0.0676	0.2754	15.661
	9	2019	0.029	0.0635	0.2702	16.210
	9	2020	0.023	0.1073	0.2759	15.935
	9	2021	0.023	0.1238	0.2708	16.061
Stanbic Holdings	10	2017	0.024	0.0299	0.2767	13.562
	10	2018	0.021	0.0481	0.2743	14.290
	10	2019	0.017	0.0505	0.2706	14.979
	10	2020	0.022	0.0666	0.2692	14.970
	10	2021	0.021	0.0945	0.2684	14.799
Standard Chartered	11	2017	0.027	0.0724	0.2737	14.378
	11	2018	0.036	0.1015	0.2700	14.704
	11	2019	0.024	0.0829	0.2668	14.957
	11	2020	0.028	0.0901	0.2668	14.831
	11	2021	0.027	0.1169	0.2676	14.540