

**EFFECT OF CREDIT RISK ADMINISTRATION ON FINANCIAL PERFORMANCE
OF COMMERCIAL BANKS IN KENYA**

BY

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DECLARATION

I declare that this is my original work and has not been submitted to any institution for academic purposes.

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I do hereby confirm that I have examined the master’s dissertation of

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ABSTRACT

Credit risk has for a long time been an area of interest not just to bankers but to the whole business community. This is so since the uncertainties of a trading companion not fulfilling his responsibilities on due date can extremely put at risk the affairs of the other companion. This study aimed to determine the relationship between credit risk administration and financial performance of commercial banks in Kenya. It was guided by 3 specific objectives; to determine the effect of default rate on financial performance of commercial banks in Kenya, to analyze the effect of capital adequacy on financial performance of commercial banks in Kenya and to determine the effect of cost to loan on financial performance of commercial banks in Kenya. The research design for this study was descriptive survey. Secondary data was sourced from the published annual financial reports of the banks covering a period of 5 years (2011-2015). An empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Kenya over the period of 5 years (2011-2015) was done. 40 commercial banking firms were selected on a cross sectional basis for 5 years. The traditional profit theory was employed to formulate profit, measured by Return on Average Assets (ROAA), as a function of the ratio of default rate, ratio capital adequacy and the ratio of cost to loan as measures of credit risk. Panel model analysis was used to estimate the determinants of the profit function. The data contained both the cross sectional and time series data and therefore panel data model was used. Hausman test was carried out to determine the model to be used for estimates reporting. Fixed effects Panel Data model was used to analyze and report on the finding. The result showed that credit risk management is an important predictor of commercial bank financial performance. This research indicates that Non-performing loans/Gross loans ratio is employed to estimate the effectiveness and suitability of a banks' credit risk management. The empirical results show a negative effect of non-performing loans on banks profitability. The results also reveal that the Capital adequacy ratio has a positive affect the profits of the Kenyan commercial banks as measured by ROAA, suggesting as CAR ratio increases performance of commercial banks do also increase. This research indicates that cost to loan asset ratio (CLA) is employed to estimate the effectiveness and suitability of a banks' credit risk management. The empirical results show a negative effect of CLA on banks profitability. The study recommends that bank management should put into place credit risk administration policies that would improve the performance of the banks. Banks also need to place and devise strategies that will reduce exposure as far as capital adequacy is concerned. Finally, operating costs should be managed prudently so as to maximize returns to shareholders.

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DEDICATION

I dedicate this dissertation to my entire family who have supported me throughout and have ensured that I get the best education to guarantee me for a better future.

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DEFINITION OF TERMS

The credit risk Admiration: Are measures employed by banks to avoid or minimize the adverse effect of credit risk.

Credit risk policy: Statement of the amount and kinds of risks an organization is prepared to take in relation to its objectives. It differs from industry to industry according to the capability to absorb losses and the rate of return it seeks from its dealings (Mishkin, 2004).

Credit Securitization: It is the transfer of credit risk to a factor or insurance firm and this relieves the bank from monitoring the borrower and fear of the hazardous effect of classified assets.

The return on assets: is a ratio that measures company earnings before interest & taxes (EBIT) against its total net assets.

Default rate: is the term for a practice in the financial services industry for a particular lender to change the terms of a loan from the normal terms to the default terms that is, the terms and rates given to those who have missed payments on loan

Cost to loan asset: is the average cost to loan advanced to customer in monetary term.

Capital Adequacy Ratio: is a measure of the amount of bank's capital expressed as a percentage of its risk weighted credit exposure.

LIST OF ABBREVIATION AND ACRONYMS

BCBS - Basel Committee on Banking Supervision

CAPM - Capital Asset Pricing Model

CAR - Capital Adequacy Ratio

CBK - Central Bank of Kenya

CLA - Cost to loan Asset

DR - Default Rate

GDP - Gross Domestic Product

IMF - International Monetary Fund

MPA - Members Personal Account

NIM - Net interest margin

NPLs - Non Performing Loans

ROAA - Return on Average Assets

ROAE - Return on Average Equity

SACCOs - Savings and Credit Co-operative Societies

TL - Total Loans

VAR - Value at Risk

CHAPTER ONE

INTRODUCTION

1.1 Back ground of the Study

Banks are exposed to different types of risks, which affect the performance and activity of these banks, since the primary goal of the banking management is to maximize the shareholders' wealth. So in achieving this goal, banks' managers should assess the cash flows and the assumed risks as a result of directing its financial resources in different areas of utilization. Credit risk is one of the most significant risks that banks face, considering that granting credit is one of the main sources of income in commercial banks. Therefore, the management of the risks related to that credit affects the profitability of the banks (Li and Zou, 2014).

The health of the financial system has an important role in the country (Das & Ghosh, 2007) as its failure can disrupt economic development of the country. Financial performance is the company's ability to generate new resources, from day-to-day operations over a given period of time and it is gauged by net income and cash from operations. The financial performance measure can be divided into traditional measures and market based measures (Aktan & Bulut, 2008). During the 1980's and 1990's when the financial and banking crises became worldwide, new risk management banking techniques emerged. To be able to manage the different types of risks, one has to define them before one can manage them. The risks that are most applicable to banks are: credit risk, interest rate risk, liquidity risk, market risk, foreign exchange risk and solvency risk.

Risk administration is the human activity which integrates recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial

resources (Appa, 1996) whereas credit risk is the risk of loss due to debtor's non-payment of a loan or other lines of credit (either the principal or interest or both) (Campbell, 2007). Default rate is the possibility that a borrower will default, by failing to repay principal and interest in a timely manner. A bank is a commercial or state institution that provides financial services, including issuing money in various forms, receiving deposits of money, lending money and processing transactions and the creating of credit (Campbell, 2007).

Credit risk administration is very important to banks as it is an integral part of the loan process. It maximizes bank risk, adjusted risk rate of return by maintaining credit risk exposure with a view to shielding the bank from the adverse effects of credit risk. Lately, banks are investing a lot of funds in credit risk administration modelling. The importance of credit risk management in banks is due to its ability in affecting the banks' financial performance, existence and growth. The probability of a bank debtor or counterparty failing to pay their debts according to the established terms is known as credit risk. Chijoriga (1997) argues that the most costly risk that financial institutions are prone to is credit risk. It directly hampers the creditworthiness of financial institutions making its influence, in comparison with other risks, more substantial. In comparison with other types of risks, the degree and level of loss that results from credit risk is wanton and results to very great loan losses and has a possibility of leading to failure of the bank. Despite the fact that financial institutions have for several reasons encountered teething troubles for a long period, careless credit principles that borrowers and counterparties are assessed with, poor range of management of risk, or failure to carefully look at the fluctuations in circumstances which can result in serious banking problems (Basel, 1999).

Controlling risk according to Apps (1996) is the social activity that assimilates recognition of risk, risk evaluation, coming up with tactics to manage it, as well as alleviating the risk using resources of management. Default rate according to Campbell, John and Hamao (1993) is the probability that a debtor fails to pay, by failing to repay the primary amount and interest in time whereas borrower's failure to pay a given loan or any other form of credit be it the primary amount or interest on loan or both resulting to loss, is the credit risk.

While banks advance credit with expectations that the debtors are going to repay their loans, the loans given to such loan seekers might have a possibility of not being repaid because some of these debtors sometimes fail to pay and as such, banks' profits fall because of the necessity of providing for such loans. Revenues are always different wherever financial institutions fail to make sure they have a hint of what percentage of their debtors will fail to pay, as a consequence banks are exposed to one more risk of inconsistency of their profits. When banks loan to businesses and consumers, the said financial institution becomes prone to risks.

Administration of credit risk is an essential part of the loan procedure in financial institutions; therefore it is of great importance. Its aim is protecting the financial institution from the grave effects of credit risk. It upholds the exposure of credit risk as it capitalizes on the bank's risk and the adjusted risk rate of return. Campbell (2007) finds that in banks a lot of resources are being put in the modeling of the management of credit risk. The administration of credit risk through risk evaluation, coming up with strategies to control it as well as alleviation of risk by use of managerial resources is a well-thought-out tactic of dealing with uncertainties. According to Chen (2008), accommodating some or all of the consequences of a specific risk,

decreasing the adverse effects of the risk, shifting the risk to a new party and evading the risk are some of the strategies of doing so.

1.1.4 The Structure of Banking Sector in Kenya

The Kenyan financial sector is generally considered to be more of bank-based than market-based since the capital markets is largely nascent, underdeveloped and narrow. Bank assets as a percentage of total assets of financial sector are about 57%. The vital role played by commercial banks in Kenya in financing economic growth brings to the fore the need to study the funding structure of commercial banks. The banking industry in Kenya has, for the past decade, undergone many regulatory and financial reforms. These reforms brought about many structural changes in the sector and also encouraged foreign banks to enter and expand their operations in the country, Kamau, (2009).

In fact, Oloo (2009) described the banking sector in Kenya as the bond that holds the country's economy together. Sectors such as the agricultural and manufacturing virtually depend on the banking sector for survival and growth. The performance of the banking industry in Kenya improved immensely over the last ten years; only 3 banks were put under CBK statutory management during this period compared to 37 bank-failures between 1986 and 1998 (Mwega, 2009).

Kenyan commercial banks, by giving out loans to several small businesses, companies and venture capitalists, have a significant responsibility of marshaling monetary wealth for investing. The core of the banking industry is characterized by lending while loans create the biggest part of operational revenues therefore making them the main assets. Nevertheless the banks are exposed to extreme level of risk by the loans. There are 43 accredited commercial banks in Kenya according to CBK (2015).

1.2 Problem Statement

Gil-Diaz (2008) directly associated the main causes of serious banking problems to lax credit standards for borrowers and counterparties, poor portfolio risk management, or lack of attention to changes in economic or other circumstances that lead to worsening in the credit standing of a bank's counterparties. In unstable economic environments, interest rates charged by banks were fast overtaken by inflation and borrowers had difficulty in loan repayment as real incomes fell; insider loans increased and over concentration in certain portfolios increased giving a rise to credit risk.

For banks to support financial sustainability and get to more clients, credit risk administration is supposed to be at the core of their processes. These facts notwithstanding, over the years there was increased number of substantial bank teething troubles in both, developed as well as developing economies (Basel, 2004). Bank problems, mainly failures and financial distress troubled numerous banks, with numerous of them having been closed down by the regulatory authorities (Brownbridge & Harvey, 1998). As exposure to credit risk remained the primary source of problems in banks globally, banks and their supervisors were able to learn important lessons from previous experiences.

Kithinji (2010) analyzed credit risk management and profitability of commercial banks in Kenya and made conclusions that a greater part of the proceeds of commercial banks was affected by the sum of credit and non-performing loans; and therefore suggested that other variables other than credit and non-performing loans affected profits. Muasya (2009) analyzed the effects of non-performing loans on the performance of the banking sector in Kenya in the time of global financial crises.

The findings from his study confirmed that non-performing loans do affect commercial banks in Kenya. Wanjira (2010) examined the correlation between non-performing loans,

management practices and profitability of commercial banks in Kenya. The findings of the study concluded that there was a need for commercial banks to adopt non-performing loans management practices. Most of the local studies leaned heavily towards the various tools and techniques of credit risk administration, practices and strategies used by various institutions (Muasya, 2009; Wanjira, 2010; Kithinji 2010). The studies did not establish a clear relationship between credit risk administration and financial performance. This study therefore seeks to fill the gap by establishing the effects of credit risk administration on financial performance of commercial banks in Kenya.

1.3 Research Objectives

The study was informed by general and specific objectives which are captured hereunder.

1.3.1 General Objective

The general objective of the study was to analyze the effect of credit risk administration on financial performance of commercial banks in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives:

- To determine the effect of default rate on the financial performance of commercial banks in Kenya
- To assess the effect of capital adequacy on the financial performance of commercial banks in Kenya
- To determine the effect of cost to loan on the financial performance of commercial banks in Kenya

1.4 Research Questions

In carrying out this study, the researcher sought to answer the following research questions

- What is the effect of default rate on the financial performance of commercial banks in Kenya?
- What is the effect of capital adequacy on the financial performance of commercial banks in Kenya?
- What is the effect of cost to loan ratio on the financial performance of commercial banks in Kenya?

1.5 Scope of the Study

The study focused on 40 commercial banks in Kenya. It covered a period of 5 years from 2011 to 2015. The unit of analysis was commercial banks.

1.6 Significance of the Study

1.6.1 Bank/SACCOs Management

One of the main beneficiaries to this study would be the banks management who would benefit in putting into place credit risk administration policies that would improve the performance of the banks. The banks management would use this study as a blue print in enhancing proper credit risk administration.

1.6.2 Government

Government agencies would use the recommendations to put into place policies aimed at improving credit risk administration practices in banks and other financial institutions they regulate.

1.6.3 Future researchers

Finally, the study would be a valuable addition to literature review and scholars of business, finance and credit administration who would use the study results to further their knowledge. Similarly the study would be used to give further insight to the field of research and give answers to research questions not covered by this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focusses on the review of related theoretical and empirical literature on credit risk administration and performance of Kenyan banks. The chapter also presents several research gaps from empirical evidence and a brief of how the current study intends to fill such gaps. Finally, a conceptual framework is presented showing the link between study variables. The study contends that the framework is the bedrock upon which concurrent discussions in the study will be based.

2.2 Theoretical Orientation

This section highlights the theories that anchor the study. In particular the theories captured include Portfolio Theory of Investment, Information Theory, Agency Theory and finally Adverse Selection Theory

2.2.1 Portfolio Theory of Investment

The single most efficient way of increasing returns while decreasing risk in investment, is portfolio holding. The modern portfolio theory introduced approximate mean-variance analysis to simplify the portfolio selection problem. Markowitz (1959) attempted to quantify risk and quantitatively reveal why and how portfolio diversification worked to reduce risk for investors.

The larger the expected return, according to the portfolio theory, the better the investment and the investment is more attractive when the standard deviation of the return is smaller. However, each asset class generally had different levels of return and risk and also behaved uniquely so that one asset may be increasing in value as another is decreasing or at least not increasing as much, and vice versa. The CAPM showed that investors required high levels of

expected returns to compensate them for high expected risk (Jobson & Korkie, 1979). Therefore this theory is important to this study because it will help us to determine how a well selected portfolio can contribute to the performance of commercial banks in Kenya.

2.2.2 Information Theory

A number of scholars, Derban, Binner and Mullineux (2005) submitted that financial institutions should vet their borrowers through evaluation of their credit worthiness. Information gathered from the prospective borrowers had to be reliable and was very vital if effective vetting was to be achieved. In evaluating the borrowers, quantitative and Qualitative methods are very useful. This is despite the fact that qualitative models are very subjective in nature which could pose a major challenge. Nonetheless, Derban, Binner and Mullineux (2005) proposed a possible solution by suggesting that numbers bearing the total of the values in comparison with a threshold can be allocated to the characteristics of borrowers if they are assessed through qualitative models. This method reduces the costs of processing, minimizes the biased judgments and probable prejudices. The ranking methods become very useful if they track changes in the anticipated level of credit loan loss.

Bridge (1998) established that computable models eases the numerical establishment of essential factors which are useful in the explanation of default risk, the assessment of the comparative level of significance of such factors, the improvement of the valuing of default risk, sorting out bad loan borrowers and the calculation of any provisions that are required to counter loan losses that are anticipated in the future. Therefore this theory will help to gauge the contribution of information gathering to the performance of commercial banks.

2.2.3 Agency Theory

The theory explained why, when undertaken by members of a group, behavior or decisions varied. It described specifically, the relationship between individual parties called the

principal that delegates work to another called the agent. It explained their differences in behavior or decisions by noting that the two parties often had different goals and, independent of their respective goals, and had different attitudes toward risk. The concept originated from the work of Berle and Means who were discussing the issues of the agent and principle as early as 1932. To explain the origins of those conflicts Murtishaw and Sathaye (2006) explain they utilized the notions of agency and principal and they saw how the interests of the directors and managers of a given firm differ from those of the owner of the firm. Therefore the theory will be applied to gauge its contribution to the administration of credit risk and subsequent output to financial performance of commercial banks.

2.2.4 Adverse Selection Theory

Pagano and Jappelli (1993) developed the adverse selection theory which stated that; information sharing improved the pool of borrowers, decreased defaults and reduced interest rates. Exchange of information increases the banks' possibility of price discrimination between safe and risky borrowers. Increased the rate of lending to safe borrowers does not give back for the reduction in lending to the risky types. When credit markets were contestable, lending activity were likely to increase: and information sharing increased banking competition (Jappelli & Pagano, 2002). Credit bureaus also fostered competition by reducing informational rents. Therefore this theory will help to determine how information sharing among commercial banks will contribute to financial performance of commercial banks.

2.3 Empirical Literature Review

2.3.1 Default Rate and Financial Performance of Commercial Banks

Hosna Manzura and Juanjuan (2009) found that non-performing loans indicator effected unprofitability as measured by (ROE) more than capital adequacy ratio, and the effect of credit risk management on profitability was not the same for all the banks included in their study. Janice (2009) found that the absence of effective credit risk management led to occurrence of the banking crisis, and inadequate risk management systems caused the financial crisis. Kithinji (2010) assessed the effect of credit risk management on the profitability of commercial banks in Kenya. Data on the amount of credit, level of non-performing loans and profits were collected for the period 2004 to 2008. The findings revealed that the bulk of the profits of commercial banks are not influenced by the amount of credit and non-performing loans, therefore suggesting that other variables other than credit and non-performing loans impact on profits.

Chen and Pan (2012) examined the credit risk efficiency of 34 Taiwanese commercial banks over the period 2005-2008. Their study used financial ratio to assess the credit risk and was analyzed using Data Envelopment Analysis (DEA). The credit risk parameters were credit risk technical efficiency (CR-TE), credit risk allocative efficiency (CR-AE), and credit risk cost efficiency (CR-CE). The results indicated that only one bank is efficient in all types of efficiencies over the evaluated periods. Overall, the DEA results show relatively low average efficiency levels in CR-TE, CR-AE and CR-CE in 2008. Gakure, Ngugi, Ndwiga and Waithaka (2012) investigated the effect of credit risk management techniques on the banks' performance of unsecured loans. They concluded that financial risk in a banking organization might result in imposition of constraint son bank's ability to meet its business objectives.

Kolapo, Ayeni and Oke (2012) showed that the effect of credit risk on bank performance measured by ROA was cross-sectional invariant, though the degree to which individual banks were affected was not captured by the method of analysis employed in the study.

Poudel (2012) explored the various credit risk management indicators that affected banks' financial performance; he found that the most indicators affected the bank financial performance was the default rate. Musyoki and Kadubo (2012) seek to assess various parameters pertinent to credit risk management as it affects banks' financial performance. They concluded that all these parameters had an inverse impact on banks' financial performance; however the default rate was the most predictor of bank financial performance, on the contrary of the other indicators of credit risk management. Li and Zou (2014) found that the indicator of Nonperforming loans had positive impact on banks profitability as measured by return on equity (ROE) and return on assets (ROA).

Al-Khouri (2011) assessed the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in 6 of the Gulf Cooperation Council (GCC) countries over the period 1998-2008. Using fixed effect regression analysis, results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk. Ben-Naceur and Omran (2008) in attempt to examine the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989-2005 found that bank capitalization and credit risk have positive and significant impact on banks' net interest margin, cost efficiency and profitability.

2.3.2 Capital adequacy and Financial Performance of Commercial Banks

Hakim and Neaime (2001) tried to examine the effect of liquidity, credit, and capital on bank performance in the banks of Egypt and Lebanon; they found that there was a sound risk management actions and application of these banks rules and laws. Abdelrahim (2013) concluded that liquidity and bank size affected strongly on effectiveness of credit risk management. Adeusi, Akeke, Adebisi and Oladunjoye (2013) concluded that risk management indicators (doubt loans, and capital asset ratio) effected on banks performance. Berrios (2013) showed that less discreet lending affected negatively on net interest margin. Kaaya and Pastory (2013) showed that credit risk indicators negatively affected on the bank's performance. Ogboi and Unuafe (2013) concluded that bank's financial performance had been affected by sound credit risk management and capital adequacy.

2.3.3 Cost to loan and Financial Performance of Commercial Banks

Aduda and Gitonga (2011) found that the credit risk management effected on profitability at a reasonable level. Aruwa and Musa (2012) investigated the effects of the credit risk, and other risk components on the banks' financial performance. They found a strong relationship between risk components and the banks' financial performance. Boahene, Dasah and Agyei (2012) examined the relationship between credit risk and banks' profitability. They found a positive relationship between credit risk and bank profitability. Nawaz and Munir (2012) found that credit risk management effected on the banks' profitability, and they recommended that management should be cautious in setting up a credit policy that might not negatively affect profitability. Abiola and Olausi (2014) revealed that banks' profitability had been affected by credit risk management. Singh (2013) revealed that Effective risk management was critical to any bank for achieving financial soundness. Idowu and Awoyemi (2014)

revealed that credit risk management had an effect on the banks' profitability. Kurawa and Garba (2014) revealed that the variables of credit risk management effected on the banks profitability.

Kargi (2011) evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress. Epure and Lafuente (2012) examined bank performance in the presence of risk for Costa-Rican banking industry during 1998-2007. The results showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the net interest margin.

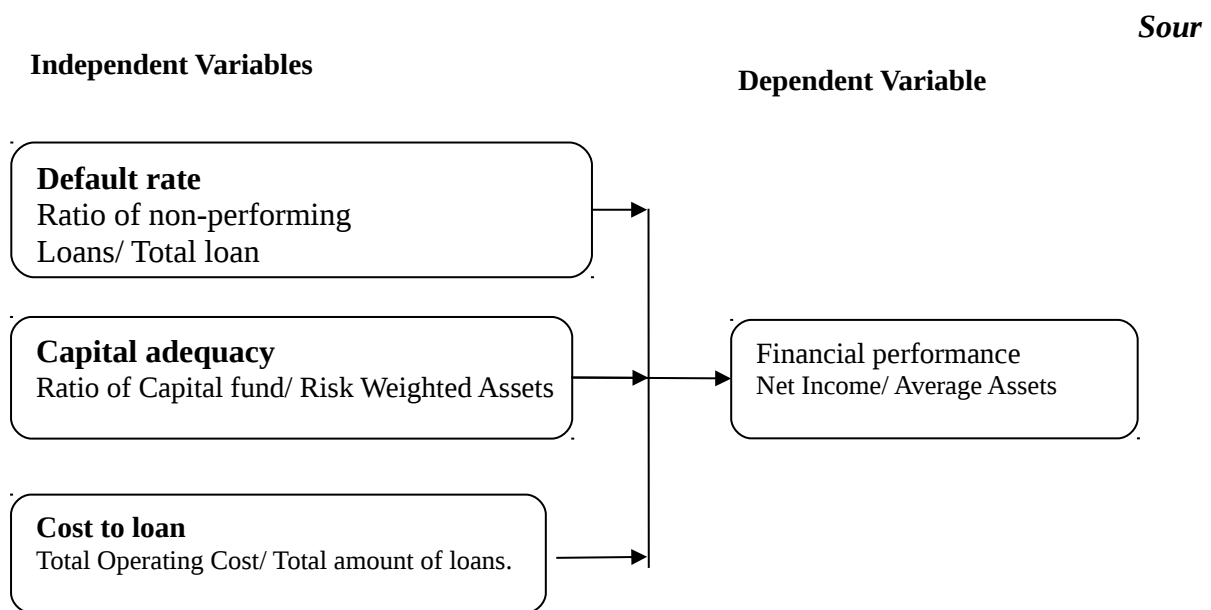
Felix and Claudine (2008) investigated the relationship between bank performance and credit risk management. It could be inferred from their findings that return on equity (ROE) and return on assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions thereby leading to a decline in profitability. Ahmad and Ariff (2007) examined the key determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. The study found that regulation is important for banking systems that offer multi-products and services; management quality is critical in the cases of loan-dominant banks in

emerging economies. An increase in loan loss provision is also considered to be a significant determinant of potential credit risk. The study further highlighted that credit risk in emerging economy banks is higher than that in developed economies.

2.4 Conceptual Framework

The conceptual framework of this study is depicted in figure 2.1 below

Figure 2.1 Conceptual Framework



ce: Researcher (2017)

The study had two sets of variables, that is, credit risk administration indicators as independent variables and financial performance as the dependent variable.

2.5 Operationalization of the study variables

The study variables were operationalized as per table 2.1 below.

Table: 2.1 Operationalization of Study Variables

Category	Type of Variable	Operationalization	Measurement
Independent variable	Default rate	DR is the terms and rates given to those who have missed payments on loan	$DR \text{ ratio} = \frac{\text{Non Performing Loans}}{\text{Total loan}}$
Independent variable	Capital Adequacy Ratio	CAR is a measure of the amount of bank's capital expressed as a percentage of its risk weighted credit exposure.	$CAR = \frac{\text{Capital fund}}{\text{Risk Weighted Assets}}$
Independent variable	Cost to loan	CLA is the average cost to loan advanced to customer in monetary term.	$CLA \text{ Ratio} = \frac{\text{Total Operating Cost}}{\text{Total amount of loans.}}$
Dependent variable	Return on Average Assets	Return on Average Assets	$ROAA = \frac{\text{Net Income}}{\text{Average Assets}}$

Source: Researcher (2017)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights the methodology that informed the study. This includes: research philosophy, research design, target population as well as diagnostic tests. The chapter further presents an overview of the data collection, analysis procedure and presentation of the study results. The chapter concludes by providing an operationalization of the research variables.

3.2 Research Design

Research design is a configuration of the research which constitutes how the research is structured; it is the logical thread which holds together all the crucial aspects of the research so that they can derive meaning (Laurel, 2011; Kothari, 2010). In recognition of the fact that no single design exists in isolation, Saunders, Lewis and Thornhill, (2007) postulates that combining different designs in one study enables triangulation and increases validity of the findings. This study adopted a descriptive design. Descriptive design could either be longitudinal or cross-sectional which will both be used in this study. Cross-sectional design is appropriate for studies where data is collected from a large sample with several variables being studied at the same point in time as opposed to longitudinal designs where several variables are studied over a period of time.

Survey design was considered to be ideal since Mugenda and Mugenda (2003) indicate that it can be used for explaining or exploring the existing status of two or more variables, at a given point in time, and is usually the most appropriate measure of characteristics of large populations. Exploratory analysis deals with within firms and between firms analysis.

3.3 Target Population

Mugenda and Mugenda (2003) describe the target population as the complete set of individual cases or objects with some common characteristics to which the researcher wants to generalize the results of the study. Therefore the target population of the study was 40 of the total 43 commercial banks (Appendix ii) whose 5 year data was available. This period was chosen because it was long enough to provide a trend of financial performance for generalization.

3.4 Sampling Design and Sample Size

A sampling design is a definitive plan for obtaining a sample from a given population (Kothari, 2005). It refers to the technique or the procedure the researcher would adopt in selecting some sampling units from which inferences about the population is drawn. Sampling involves selecting a satisfactory number of the right elements from the population ([Groves, 2010](#)). This study adopted a census study of all the 40 (of the 43) commercial banks in Kenya whose annual reports were available.

3.5 Data Collection Procedure

The study employed secondary data. The study utilised panel data which consisted of both time series and cross-sectional data. A combination of time series with cross-sections enhances the quality and quantity of data to levels that would otherwise be impossible to achieve with only one of the two dimensions (Gujarati, 2003). The data for all the variables in the study was extracted from published annual reports and financial statements of the commercial banks covering the years 2011 to 2015 and compiled by Think Business Africa. The data will be obtained from the annual Banking Survey Reports by Think Business for the period under reference. The specific financial statements from which data was be extracted included the statement of comprehensive income, statement of financial position, and notes to

the accounts. The researcher will use a document review guide to extract and compile the required data for analysis from the financial statements.

3.6 Data Analysis

Kothari (2009) defines data analysis as the application of logic to understand and interpret data collected. Exploratory data analysis examined heterogeneity across the banks and over a period of five years. This analysis was essential in the determination of whether to use the panel data models or simply use pooled regression models. Exploratory data analysis was done using graphs to examine the trend of returns within and across banks. Quantitative method of data analysis was used. The data was analyzed using descriptive statistics, correlation analysis, and panel multiple regression analysis. The panel methodology was aided by STATA 16.0 software. Descriptive statistics was used to summarise and profile the status of credit risk administration practices and performance among commercial banks in Kenya. By calculating the profitability for each year for the period of study, trend analysis was done by comparing the profitability ratio to default rate, cost to loan assets and capital adequacy ratio. The Hausman specification test was not used for model specification since some assumptions of regression analysis were violated. After diagnostic testing, the Prais-Winsten Panel regression model (with corrected standard errors) was deemed the best empirical model since it allows for data with serial correlation, cross-sectional dependence and heteroscedasticity.

3.7 Diagnostic Tests

The study conducted various diagnostic tests to appraise whether the data met the assumptions of classical panel data analysis using either pooled, fixed effects or random effects methods. In particular, the diagnostic tests that were carried out are tests for random and fixed effects, variance inflation factors to investigate multicollinearity, Wooldridge test

for serial correlation, pasaran cross dependence test, and modified wald test for heteroscedasticity.

3.8 Model Specification

Following similar studies (Lee et al., 2013; Kosmidou, 2008) in which assumptions of classical linear regression (CLRM) were violated, A prais winsten Panel regression model with corrected standard errors was fitted. The general equation for panel regression analysis model is expressed as follows:

$$y_{it} = \alpha + \beta_{1i}X_{1it} + \beta_{2i}X_{2it} + \beta_{3i}X_{3it} + \mu_{it} \dots \dots \dots (i)$$

Where:-

Y_{it} = Financial performance for i^{th} Bank in t^{th} year.

α = the intercept

X_{it} = vector representing independent variables (Default Rate, Capital Adequacy Ratio, Cost to loan) for bank i in year t ,

β_{it} = Vector of Coefficients of the independent variables for bank i in year t ,

μ_{it} = Errors Term for i^{th} Bank in t^{th} year.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This study sought to establish the significant effect of credit risk administration on financial performance of commercial banks in Kenya. Hence, the chapter presents findings from panel data analysis of secondary data on financial statements of 40 commercial banks licensed by the Central Bank of Kenya. The chapter begins with a discussion of descriptive data analysis and exploratory analysis of the panel data. Diagnostic testing to examine existence of panel level stationarity, multicollinearity of independent variables, serial correlation, cross sectional dependence, heteroscedasticity and normality of error terms is conducted next. Thereafter, a prais winsten Panel regression model with corrected standard errors is fitted to determine the effect of the three independent variables on financial performance of banks. Lastly, the chapter discusses the study findings (by comparing and contrasting the same with other studies) and a summary of key findings.

4.2 Descriptive Statistics

The study examined the descriptive pattern of the dependent variables, study findings were summarised as shown in Table 4.1. From the findings on average all banks had an average return on assets of 15.73% with an overall variation of 3.1088, over minimum of 0.4511% and maximum of 23.0236%. The skewness was -1.442 and kurtosis was 7.146. Debt ratio had a mean of 8.1466. Capital adequacy ratio had a mean of 25.28. The maximum value was 118.82 while the minimum was 8.868. On Cost to loan, the minimum was 2.85. The maximum was 103.17 while the average was 10.206

Table 4.1 Descriptive Statistics

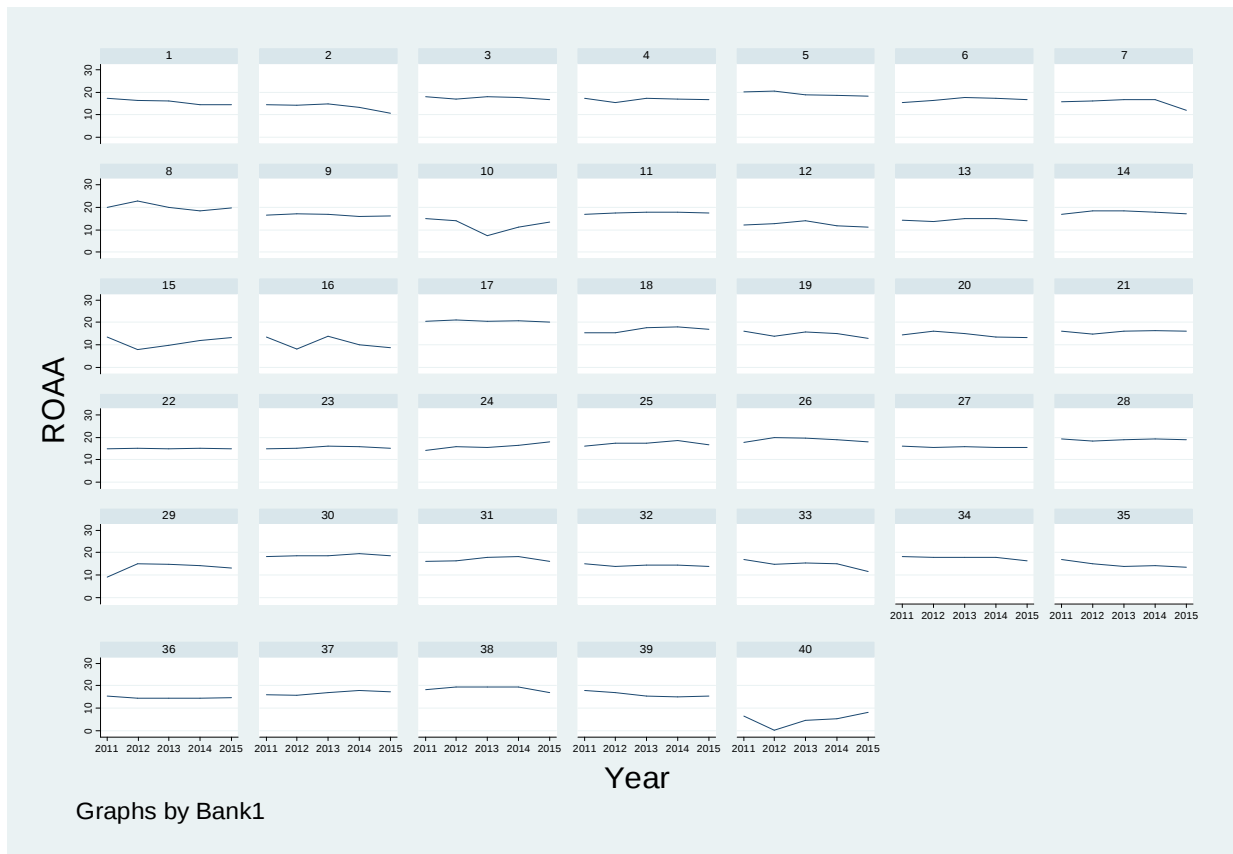
	mean	max	min	sd	skewness	kurtosis
ROAA	15.73542	23.02357	0.04511	3.108875	-1.44196	7.146248
DR	8.146681	46.06397	-0.64008	6.749741	1.97294	8.708312
CAR	25.28766	118.8275	8.868866	15.19963	3.164732	16.41165
CLA	10.20677	103.1731	2.859353	11.38141	5.749022	40.3054

Source: Researcher (2017)

4.2 Exploratory Data Analysis

Exploration data analysis examined heterogeneity across the banks and over a period of five years. This analysis was essential in the determination of whether to use the panel data models or simply use pooled regression models. Exploratory data analysis was done using graphs to examine the trend of returns within and across banks. The study used growth plots to study within-firm behavior of ROAA. Figure 4.1 below indicates the empirical growth of ROAA over the five-year period. The growth plot reveals that for most banks, ROAA did not change much with time period under study. There were however some few cases where ROAA appeared to change significantly i.e. 15, 16, and 40. However these few outliers don't suggest existence of significant time-related fixed effects.

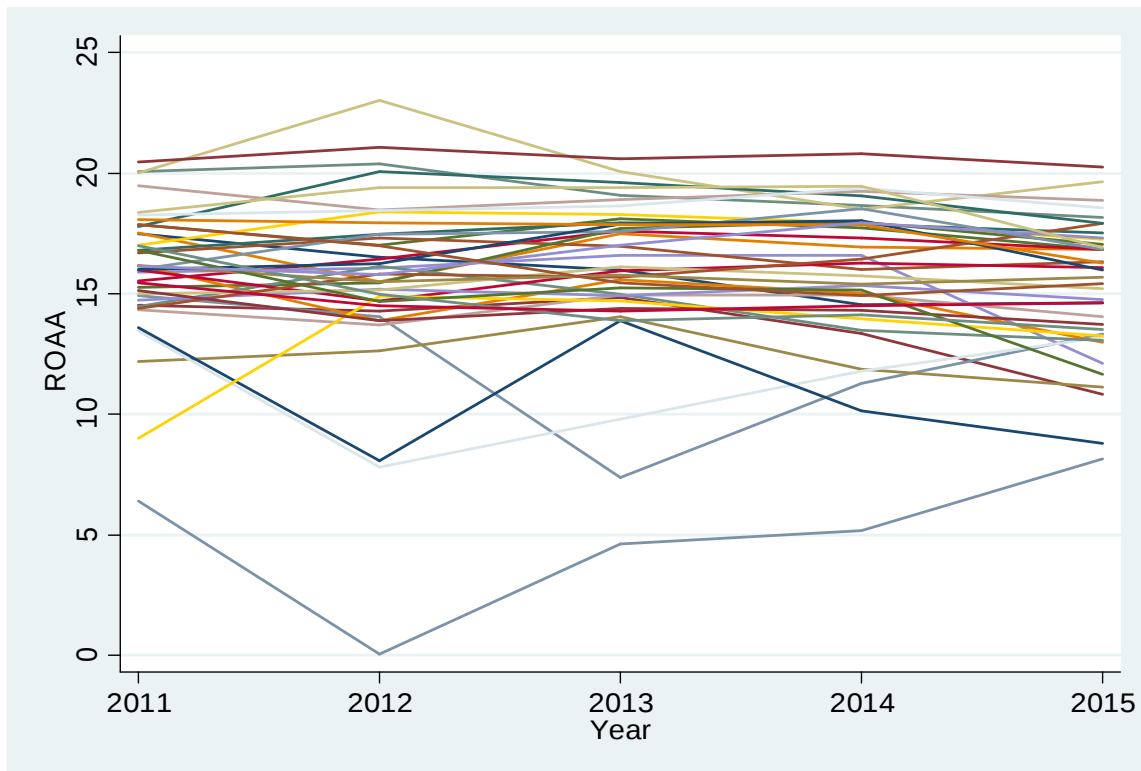
Figure 4.1 Growth Plot of ROAA



Source: Researcher (2017)

Further observation of the overlain ROAA plot indicated slopes being non-significantly different among most of the banks except a few with the y intercepts not similar for all the banks. Figure 4.2 below indicates the Overlain Plot of ROAA.

Figure 4.2 Overlain Plot of ROAA



Source: Researcher (2017)

4.3 Diagnostic Testing

This section reports on result of the diagnostic analysis of the panel data. Specifically, the section reports on existence of time-related fixed effects and the suitability of fitting pooled regression models as compared to panel data models. The study also examines the presence of heteroskedasticity and serial correlation. Lastly an analysis is done to determine if random effects or fixed effects models should be used.

4.3.1 Test for Random Effects

To begin with, we first examined the practicability of fitting a pooled regression model than the panel data model. The Breusch-Pagan LM test was used to determine if a simple linear regression model was more preferable than the random effects model. As table 4.2 below indicates chi-square values for the model was significant ($p < 0.001$), implying existence of

significant return on average assets among the banks. Consequently it was found inappropriate to use simple regression models.

Table 4.2 Chi-Square values for the Breusch-Pagan LM Test

Model	Dependent variable	χ^2 -value	p-value
1	return on asset (ROAA)	140.15	0.000

Source: Researcher (2017)

4.3.1 Test for Fixed Effects

Next, the study examined the presence of fixed effects. If such effects were present, then one would be required to account for the effects either by inclusion of dummy variables to capture the effects or fitting a two-way random effects model. The results of this test, shown in table 4.3, reveal that there are no significant fixed effects ($p > 0.05$) thus no need to fit two-way component models.

Table 4.3 Test Results for Fixed Effects

Model	Dependent Variable	F-Value	P-Value
1	Return On Asset (ROAA)	2.5	0.0446

Source: Researcher (2017)

4.3.2 Test for Multicollinearity

Multicollinearity is the study of the relationship between independent variables in a study. It is also viewed as the absence of a strong correlation between two or more independent variables. A correlation matrix is the conventional check for multicollinearity (Field, 2009). The matrix measures the nature and strength of relationship between the explanatory variables informing the study. To test for multicollinearity, Variance Inflation Factor (VIF) was adopted. VIF quantifies the severity of multicollinearity in a regression analysis. The magnitude of multicollinearity was analyzed by considering the size of VIF. According to

Sosa-Eacudero (2009) if $VIF = 1$, there is no correlation, if VIF is more than 5 but less than 10, there is moderate correlation and if VIF is greater than 10, there is high correlation. The common rule of thumb is that VIF should be less than 3 (Kutner, Nachtsheim&Neter, 2004). In table 4.4 below the VIF for all the variables in this study is 1.21 hence an indication that all the variables are within the threshold for multiple regression analysis and that there appears to be no excessive multicollinearity amongst the biases.

Table 4.4 Collinearity Diagnostics

. collin CAR CLA DR				
(obs=200)				
Collinearity Diagnostics				
Variable	VIF	SQRT VIF	Tolerance	R- Squared
CAR	1.31	1.15	0.7614	0.2386
CLA	1.24	1.11	0.8055	0.1945
DR	1.08	1.04	0.9288	0.0712
Mean VIF	1.21			

Source: Researcher (2017)

4.3.3 Test for Serial Correlation

Serial correlation (also called autocorrelation) is a phenomenon which occurs when the error terms of regression variables for successive periods are correlated. When present in a dataset, it can distort the efficiency of regression estimators. Using the *xtserial* STATA addon, which implements the Wooldridge test for serial correlation; the researcher tested this study's data for the presence of autocorrelation. The null hypothesis for this test is that there is no first order autocorrelation in the panels. The null is rejected if the p value of the test is less than 5%. The results for this test are shown in figure 4.3 below.

Figure 4.3 Wooldridge Test for Serial Correlation

```
. xtserial ROAA DR CAR CLA

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
      F( 1,      39) =      5.681
      Prob > F =      0.0221
```

Source: Researcher (2017)

For this study, the p value of the Wooldridge Test for Serial Correlation was less than 0.05, implying serial correlation. If a robust model is not fitted, serial correlation can distort the efficiency of regression estimators.

4.3.4 Test for Cross Sectional Dependence

Pasaran CD (Cross-Sectional Dependence) test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The results of this test are in figure 4.4 below.

Figure 4.4 Pasaran Test for Cross-Sectional Dependence

```
. xtcsd, pesaran abs

Pesaran's test of cross sectional independence =      4.960, Pr = 0.0000

Average absolute value of the off-diagonal elements =      0.443
```

Source: Researcher (2017)

Since the p value was less than 0.05, the conclusion is that there was Cross-Sectional Dependence in the dataset.

4.3.5 Test for Heteroscedasticity

Heteroscedasticity is a serious problem since it tends to inflate the standard errors, thereby increasing the probability of committing a type two errors, i.e. failing to reject a false hypothesis about a coefficient. The Modified Wald test for groupwise heteroscedasticity was used to test the data for heteroscedasticity. The null hypothesis of the Modified Wald test is that the data is homoscedastic cross entities, i.e. the error terms have a constant variance. If the null is rejected, the conclusion is that the data is heteroscedastic, i.e. the variance of error terms across entities is not constant. Figure 4.5 below shows the results of this test.

Figure 4.5 Modified Wald Test for Groupwise Heteroscedasticity

```
. xttest3

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (40) =      3737.01
Prob>chi2 =      0.0000
```

Source: Researcher (2017)

Since the p value was <0.005, we can deduce that there was a presence of heteroscedasticity in the dataset. Since heteroscedasticity tends to inflate the standard errors, a robust model must be fitted to take into account the effects of heteroscedasticity.

4.4 Model Fitting: Prais Winsten Panel Regression Model with Corrected Standard Errors

Due to violation of linear regression assumption by presence of heteroskedasticity and serial correlation the Hausman test of the model specification was not done to decide between fixed or random effects. The researcher fitted a Prais Winsten Panel regression model (with corrected standard errors) that produces robust results in the presence of serial correlation, cross sectional dependence and heteroscedasticity. The results are as per table 4.5 below.

Table 4.5 Prais Winsten Panel Regression with Corrected Standard Errors

```
. xtprcse ROAA CAR CLA DR, hetonly correlation(psar1) rhtype(tscorr)
```

Prais-Winsten regression, heteroskedastic panels corrected standard errors

```
Group variable:   Bank1                Number of obs   =    200
Time variable:   Year                  Number of groups =    40
Panels:          heteroskedastic (balanced)  Obs per group: min =    5
Autocorrelation: panel-specific AR(1)      avg =    5
                                                    max =    5
Estimated covariances =    40          R-squared       =    0.9269
Estimated autocorrelations =    40      Wald chi2(3)    =    94.39
Estimated coefficients =    4          Prob > chi2     =    0.0000
```

ROAA	Het-corrected					[95% Conf. Interval]	
	Coef.	Std. Err.	z	P> z			
CAR	.0346361	.0123355	2.81	0.005	.010459	.0588133	
CLA	-.1588856	.0263259	-6.04	0.000	-.2104833	-.1072878	
DR	-.1537479	.0249423	-6.16	0.000	-.2026339	-.1048619	
_cons	17.44394	.3254203	53.60	0.000	16.80612	18.08175	
rhos = -.1363905 .7644639 -.1456879 .6853793 .78670162740622							

Source: Researcher (2017)

The panel regression results presented in table 4.6 above indicates that the constant was 17.44394, and that this value was significant at the 5% level. This implies that in the absence of the influence of the independent variables, the dependent variable is deemed to have a value of 17.44394.

The regression results indicate show a coefficient of - 0.1537479 for default rate, with a p value of 0.0000. This implies that there was a statistically significant negative relationship between the default rate (non-performing loans to total loans ratio) and financial performance of commercial banks. Essentially, a 1% increase in non-performing loans would result to a 15.374% decrease in financial performance of commercial banks.

The coefficient of capital adequacy ratio of 0.0346361 was statistically significant at 5 percent level with p-value of 0.005 that is less than 0.05. The results indicate that there was a significant positive relationship between capital adequacy ratio and financial performance of

commercial banks as measured by return on assets. Thus a unit change in capital adequacy ratio would result to a 3.46% change in financial performance.

The coefficient of Cost to Loans Ratio ratio is -0.1588856 and significant with a p-value of 0.000 which is less than 0.05. The results indicate that there was a significant negative relationship between cost to loan and financial performance of commercial banks as measured by ROA. The negative coefficient indicates that the beta coefficient is inverse implying an inverse relationship between the financial performance of commercial banks and the cost to loan ratio. Thus a 1% increase in cost to loan ratio would result to a 15.89% decrease in financial performance.

Equation (i) can therefore be rewritten as:

$$Y = 17.444 - 0.154X_1 + 0.034X_2 - 0.159X_3 \dots \dots \dots (ii)$$

Where:

Y = Dependent Variable (Financial Performance)

17.444 = Constant (Level of Financial Performance when all independent variables are at zero)

-0.154 = Coefficient of X_3 (change in the dependent variable due to a unit change in X_3)

X_1 = Default Rate

0.034 = Coefficient of X_1 (change in the dependent variable due to a unit change in X_1)

X_2 = Capital Adequacy Ratio

-0.159 = Coefficient of X_2 (change in the dependent variable due to a unit change in X_2)

X_3 = Cost to Loans Ratio

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study sought to establish the effect of credit risk administration on financial performance of commercial banks in Kenya. Hence, the chapter presents the study summary in line with the study background, study literature, research methodology, descriptive and panel data regression analysis. The study also presents several conclusions in relation to the research objectives and hypotheses. It also presents policy implications and recommendations made to various stakeholders. The chapter further highlights the limitations of the study and further suggests areas for further research.

5.2 Summary of Findings

5.2.1 Default rate and Financial performance of commercial banks in Kenya

There was a statistically significant negative relationship between the default rate (non-performing loans to total loans ratio) and financial performance of commercial banks. The implication of this finding is that non-performing loans tend to negatively impact the revenue of banks. As such, commercial banks should put in place mechanisms to improve their loans books through reduction of non-performing loans. Management of default risk can also be enhanced by ensuring proper loan underwriting to avoid excessive lending to borrowers with high credit risk.

This study is in agreement with Abdelrahim (2013) and Li and Zou (2014) who concluded in their separated studies that changes in the default rate have an inverse impact on both profitability and share price performance of commercial banks. The study also agrees with Boahene, Dasah and Agyei (2012) who found that improvement in the quality of loan underwriting has a positive effect on banks' financial performance.

5.2.2 Capital adequacy and Financial performance of commercial banks in Kenya

There is a significant positive relationship between capital adequacy and financial performance of commercial banks in Kenya. This means that an increase in capital level leads to an increase in the financial performance of commercial banks in Kenya. Thus, in order to optimize the financial performance, management of commercial banks in Kenya should maintain an adequate level of capital adequacy.

This study is in agreement with the result of Aruwa and Musa(2012) who found that the rate of capital to total weighted risk assets has a positive effect while interest rate risk affects negatively the banks' financial performance. Kurawa and Garba(2014) also found in their findings that credit risk management as measured by capital adequacy variable has a significant positive effect on the financial performance.

5.2.3 Cost to Loans Ratio on Financial performance of commercial banks in Kenya

The results showed a significant negative relationship between cost to loan and financial performance of commercial banks as measured by ROA. The negative coefficient indicates that the beta coefficient is inverse implying an inverse relationship between the financial performance of commercial banks and the cost to loan ratio. Thus a 1% increase in cost to loan ratio would result to a 15.89% decrease in financial performance.

The study is consistent with the results of Ogboi and Unuafe (2013) that revealed management of operational costs to have a positive impact on bank's financial performance. Additionally, Kamau (2013) found staff costs to be the most significant of all operational costs. The study found executive compensation to have a positive relationship with financial performance while compensation of lower level staff members had a negative relationship with performance.

5.3 Conclusions

The general objectives of the study was to establish the effect of credit risk management on financial performance of commercial banks and specific objectives were to establish effect of capital adequacy, default rate and cost to loan assets on commercial bank financial performance. The result showed that credit risk management is an important predictor of commercial bank financial performance thus success of commercial bank performance depends on risk management. Credit risk management is crucial on the commercial bank performance since it has a significant relationship with bank performance and contributes so much to the bank performance. Among the risk management indicators, default rate management and cost to loan management are the most important predictors of the bank performance whereas cost to loan assets is not significant predictor of bank performance.

Since risk management in general has very significant contribution to bank performance, the banks are advised to put more emphasis on risk management. In order to reduce risk on loans and achieve maximum performance the banks need to allocate more funds to default rate management and try to maintain just optimum level of capital adequacy.

This research indicates that Non-performing loans/Gross loans ratio is employed to estimate the effectiveness and suitability of a banks' credit risk management. This ratio has a negative effect. This result is what is expected of NPL ratio to have a negative effect on bank's performance. The empirical results show a negative effect of non-performing loans on banks profitability.

This result reveals that, as the number of unpaid loans increases, NPL ratio decreases having an inverse effect on profitability. The results also reveal that the Capital adequacy ratio has a positive affect the profits of the Kenyan commercial banks as measured by ROAA, suggesting as CAR ratio increases performance of commercial banks do also increase. This

research indicates that cost to loan asset ratio is employed to estimate the effectiveness and suitability of a banks' credit risk management. This ratio has a negative effect. This result is also expected of CLA ratio to have a negative effect on bank's performance. The empirical results show a negative effect of cost to loan asset on banks profitability. This result reveals that, as the number of operating cost per total loan advanced increases, CLA ratio decreases having an inverse effect on profitability.

5.4 Recommendations

In view of these study findings, the following will be recommended: bank management who should put into place credit risk administration policies that would improve the performance of the banks. Banks need to place and devise strategies that will not only limit the banks exposition to credit risk but will develop performance and competitiveness of the banks, and banks should establish a proper credit risk management strategies by conducting sound credit evaluation before granting loans to customers. Government agencies would use the recommendations to put into place policies aimed at improving credit risk administration practices in banks and other financial institutions they regulate. The study would be a valuable addition to literature review and scholars of business, finance and credit administration who would use the study results to further their knowledge. Similarly the study would be used to give further insight to the field of research and give answers to research questions not covered by this study.

5.5 Areas for further study

The research gaps documented out of the research effort provide some basis for further empirical investigations. Firstly, there is need to consider carrying out a similar study that adopts other indicators like Provision for facilities loss/Net facilities, Leverage ratio to

confirm their contribution to banks performance. The study also suggests that a further study need to be undertaken that will incorporate a moderating variable that will see the contribution of the relationship between the credit risk management indicators and performance of commercial banks.

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APPENDICES

APPENDIX I: Introductory Letter

ALICE WANGUI NG'ANG'A

P.O. BOX8783-0033,

NAIROBI

TO WHOM IT MAY CONCERN

Dear Sir,

RE: KCA MSC RESEARCH PROJECT

I am Alice wangui ng'ang'a a student at KCA University, pursuing a Master's of science in finance and investment degree. As a requirement in fulfillment of this degree, am carrying out a study on the effects of credit risk administration on commercial banks financial performance in Kenya. You have been chosen as you are well positioned to provide reliable information that will enable the study achieve its objectives.

You are humbly requested to kindly provide financial statements in order to facilitate the research. The information given shall be treated with high degree confidentiality and will be purely used for the purpose only.

Thanks in advance.

Yours Sincerely

ALICE WANGUI NG'ANG'A

Appendix II: List of Commercial Banks in Kenya

Bank Rankings			
Tier I	Tier II	Tier III	Tier IV
Assets>Kshs 150bn	Assets Kshs 50-150bn	Assets Kshs 15-50bn	Assets<Kshs 15bn
Equity Bank	Citibank	Bank of India	Habib A.G.
Barclays Bank	I&M Bank	Victoria Bank	Habib Bank
CFC Stanbic	Prime Bank	Gulf African Bank	Trans National
KCB Bank	Bank of Baroda	GT Bank	UBA Bank
Co-op Bank	Family Bank	Giro Bank	Guardian Bank
Diamond Trust	Housing Finance	Sidian Bank	Paramount Bank
StanChart Bank	Ecobank	Development Bank	Oriental Bank
CBA Bank	National Bank	ABC Bank	Middle East Bank
NIC Bank	Bank of Africa	Jamii Bora Bank	First Community Bank
	Chase Bank	Fidelity Bank	Consolidated Bank
	Imperial Bank		Credit Bank
			Equitorial Commercial Bank
			Dubai Bank

Source: The Banking Survey 2017

APPENDIX III: Secondary Data Collection Tool

Commercial Banks'	2011	2012	2013	2014	2015
Ratios					
ROAA					
DR					
CLA					
CAR					

Source: Researcher 2017

