

**EFFECT OF FINANCIAL RISK ON FINANCIAL PERFORMANCE OF
COMMERCIAL BANKS LISTED ON NAIROBI SECURITIES EXCHANGE IN KENYA**

BY

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DECLARATION

Student Declaration

This dissertation is my original work and has not been presented for research for degree award in any other university.

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Supervisor Declaration

This dissertation has been submitted for examination with my approval as University.

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Signature..... Date.....

DEDICATION

It is with great honor that I extend my sincere gratitude to everyone who participated in every way to the success of my studies at The KCA University.

First, I want to thank The Almighty God for the gift of life, opportunity, strength and for seeing me through this time. I count my blessings on Him and for the good health he has given me. I cannot take it for granted.

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ABSTRACT

Financial risk concerns have been increasing and in this risk environment, banks are looking to develop robust financial risk management frameworks that satisfies compliance demands, results to better decision making, and also enhances performance. This study sought to investigate the effect of financial risk on financial performance of commercial banks in Kenya listed on the NSE. The study used the major financial risk according to Basel Committee of Banking Supervision that is operational risk, credit risk, market risk and liquidity risk. The study adopted descriptive research design approach and used secondary data for the 11 listed commercial banks. The data was obtained from the published financial statements of the commercial banks which is available from NSE, websites of the respective commercial banks and the CMA. This research covered a period of 10 years from the years 2010 to 2019. The 10-year period was necessary to enable panel data analysis. The results indicated that there was a negative and significant relationship between liquidity risk and financial performance of listed commercial banks in Kenya ($\beta = -3.5221$, $p = 0.0090$). Further, the results indicated a negative and significant relationship between credit risk and financial performance of commercial banks listed in the Kenyan NSE ($\beta = -4.2020$, $p = 0.0010$). Market risk had a negative and significant relationship with financial performance of listed commercial banks in Kenya ($\beta = -2.6809$, $p = 0.0450$). Lastly, operational risk revealed a negative but insignificant relationship with financial performance of listed commercial banks in Kenya ($\beta = -1.7752$, $p = 0.2050$). Based on the study findings the study concluded that there is a strong correlation between liquidity risk, credit risk, market risk and operational risk on financial performance of commercial banks listed with the Nairobi Securities Exchange. The study recommended that the managers can minimize credit risk by ensuring that the credit worthiness of would be borrowers is assessed together with the collateral which should be wholly ensured. The study recommends that bank managers should ensure that commercial banks invest excess cash in productive assets. Lastly, the study recommends that the banks should establish financial risk early warning mechanism so that managers can take effective real time comprehensive management to reflect banks financial position including financial structure, profitability and asset utilization to enhance operational efficiency.

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OPERATIONAL DEFINATION OF TERMS

Credit Risk Risk of default on a debt that may arise from a borrower

failing to make required payments (Van Greuning & Bratanovic, 2020).

Financial Performance Ability of the financial institution management to generate income by utilizing company assets at their disposal (Haber & Reichel, 2015).

Liquidity Risk Risk of being incapable either to meet their obligations to depositors or to fund rises in properties as they drop due, without sustaining undesirable prices or losses (Dietrich, Hess & Wanzenried, 2014).

Market Risk Risk of financial loss resulting from movements in market prices (O'Brien & Szerszeń, 2017).

Operational Risk Risk commercial banks faces when they attempt to do their day-to-day business activities (Chernobai, Ozdagli & Wang, 2020).

ABBREVIATION AND ACRONYMS

CAR Capital Adequacy Ratio

DFL	Level of Financial Leverage
MPT	Modern Portfolio Theory
NPLR	Non-Performing Loan Ratio
NSE	Nairobi Securities Exchange
ROA	Return on Assets
ROE	Return on Equity
SSA	Sub-Saharan Africa

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Risk is the potential that events, expected or unanticipated, may have an adverse impact on the institutions' capital and earnings. According to García and García (2017), financial risk is whereby returns vary or fluctuate unexpectedly. There are many types of financial risk such as operational risk, market risk, reputational risk, liquidity risk, equity risk, compliance and legal risk, strategic risk, currency risk, asset-backed risk, foreign exchange risk, credit risk among others which contribute to the volatility of financial performance (Miller, 2018). The hypothesis in financial risk is that financial risk leads into decline in banks performance if it is not well managed (Jokhadze & Schmidt, 2020).

Globally, financial risk concerns have been increasing. In this climate, firms of all kinds and sizes are looking to develop robust financial risk management frameworks that satisfies compliance demands, results to better decision making, and also enhances performance (Miller, 2018). In the Unites States of America (USA), at least 90% of financial firms use some form of financial engineering to manage market risk which are foreign exchange rates, the market risk and the commodity price risk (Barros, Ferreira & Williams, 2017).

In Sub-Saharan Africa (SSA), the profitability of commercial banks in terms of Return on Assets has been higher than the rest of the world with an average of 2% (Aruwa & Musa, 2014). This has been attributed to the higher returns investment in risky ventures. Other possible reasons are that the banking sector in the Sub-Saharan Africa presents a huge gap between the demand and supply of the banks services. Financial risk usually leads to the collapse and underperformance of financial institutions if they are not handled (Pfaff, 2016). These risk normally lead to

financial crisis if they are not managed, which leads to poor performance of firms and lowers the economy of a country and hence the living standards of people. These risk should be managed and regulated by firms and institutions so as to improve profitability and reduce losses (Eckles, Hoyt & Miller, 2014; Barros, Ferreira & Williams, 2017).

When banks have financial market exposure, there is a possibility of loss but also an opportunity for gain or profit. Financial market exposure may provide strategic or competitive benefits (Alexander, 2015; Githaka, Maina & Gachora, 2017). The factors for handling financial risk coincide as those for applying a risk monitoring, as financial risk is a subcategory of the company's risk. The major goal is to decrease the volatility of revenues or cash flows because of financial risk direct exposure (Archer & Karim, 2017). The decrease makes it possible for the firm to perform far better projections (Fani, Khan & Kumar, 2018). This will assist to guarantee that enough funds are available for financial investment and rewards. An additional debate for taking care of financial risk is to stay clear of financial distress as well as the expenses associated with it (Lelgo & Obwogi 2018; Muriithi & Waweru, 2017). The banking sector in Kenya is exposed to various risk which originate from both the internal and external environment. Financial risk threatens their financial viability and long-term sustainability.

1.1.1 Financial Risk

In the banking industry, there exist many different types of risk that affect the performance and activities of banks. Risk class is deemed to be either systematic (market) or unsystematic risk or financial and non-financial risk (Kandasamy, 2018). More specifically these classes contain distinct risk according to what causes them such as credit risk, liquidity risk, operational risk, market risk, political risk, currency risk and strategic risk (Dietrich, Hess & Wanzenried, 2014; Pfaff, 2016; Imane, 2014). The study narrowed to the major financial risk according to Basel

Committee of Banking Supervision that is operational risk, credit risk, market risk and liquidity risk.

Operational risk summarizes the uncertainties and hazards commercial banks faces when they attempt to do their day-to-day business activities (Chernobai, Ozdagli & Wang, 2020). This is a business risk, which can result from breakdowns in the internal procedures, people and systems as opposed to problems incurred from external forces, such as political or economic events, or inherent to the entire market or market segment, known as systematic risk (Pepi, 2019).

Credit risk policies of a commercial bank comprise those decision-making structures associated with the reduction of exposures to credit asset classification and loan loss provisioning (Ahmad, 2020). According to Basel Committee of Banking Supervision (2003), management of bank risk relates to the minimization of the potential that a bank borrower or counter-party will fail to meet its obligations in accordance with agreed terms (Van Greuning & Bratanovic, 2020).

Market risk encompasses the risk of financial loss resulting from movements in market prices (O'Brien & Szerszeń, 2017). Market risk mainly occurs from a bank's tasks in capital markets. It is due to the changeability of equity markets, product prices, rate of interest, as well as credit history spreads. Banks are extra revealed if they are heavily entailed in purchasing funding markets or sales as well as trading (Holod, Kitsul & Torna, 2020). Commodity prices also play a role because a bank may be invested in companies that produce commodities. As the value of the commodity changes, so does the value of the company and the value of the investment. Changes in commodity prices are caused by supply and demand shifts that are often hard to predict (Kandasamy, 2018).

Liquidity risk in commercial banks is specified as the risk of being incapable either to meet their obligations to depositors or to fund rises in properties as they drop due, without sustaining

undesirable prices or losses (Dietrich, Hess & Wanzenried, 2014). Liquidity risk is the opportunity of adverse impacts on the interests of proprietors, consumers as well as various other stakeholders of the financial establishment resulting from the inability to fulfill existing money responsibilities in a prompt as well as affordable manner (Pfaff, 2016; Ogol, 2011). Efficient liquidity administration needs maintaining sufficient money gets available while additionally investing as several funds as feasible to maximize profits (Pepi, 2019).

Risk management therefore, is the process whereby organizations use the necessary tools so as to hedge risk and prevent it from occurring. Risk plays an important role in organizations as it makes the managers be keen in monitoring the financial patterns. It is however important for institutions to manage risk so as to prevent uncertainties on the returns and profits to expect. Most firms worldwide are exposed to financial risk hence they should take the necessary steps to prevent it.

Banks therefore are required to take the necessary precautions to avoid experiencing financial crisis, which may lead to the loss of customers. This will enable the banks to operate on a longer period without running into debt. According to Diffu (2011) the crisis experienced worldwide during the period 2001 to 2009 affected the financial steadiness and their economic performance, but it sharpened banks on the importance of hedging against risk by implementing the necessary methods.

1.1.2 Financial Performance

In finance, the subject of financial performance has been receiving significant attention from many researchers. The term ‘financial performance’ is used as a general measure and has been the primary concern of business. High financial performance is interpreted to imply that management is effective in employing the company’s resources. (Naser & Mokhtar 2014).

Performance is the ability of a firm to attract and manage the resources in several different ways to develop a competitive advantage (Iswatia, & Anshoria, 2017).

Evaluation of financial performance is a subjective measure which aims into assessing an organization's usage of assets in the generation of revenues (Pinto *et al.*, 2017). Ijaz and Naqvi (2016) argue that even though the evaluation of a firm's financial performance takes into account many other different kinds of measures, the most common performance measurement used in the field of finance and statistical inference is financial ratios. On the other hand, Myskova and Hajek (2017) posit that financial ratios are commonly used due to their simplicity and additional information value.

Several profitability measurement ratios have been used in financial statement analysis. One of the most popular measurement ratio of financial performance is Return on investment (ROI). ROI ratio is computed by dividing net income by the cost of investment and measures the gain or loss generated on an investment relative to the amount of money invested. On the other hand, many scholars consider Return on assets (ROA) to be the most useful ratio due to its accuracy when it comes to measuring performance. Computation of ROA ratio is achieved by subdivision of net income by total assets and measures how well a fund is doing. ROA also indicates how well the fund's assets have been invested used to generate optimal return (Kamwaro, 2013). This study used Return on assets (ROA) to measure financial performance of the commercial banks since it an effective method to measure how the bank is in converting the money it invests into net income.

Financial statements are the final product of the accounting process. The main purpose of financial reporting is to provide financial information to stakeholders such as shareholders and creditors in order to assist them in decision (Osano, 2013). When analysing monetary statements,

one should keep in mind the purpose of the evaluation. Since various analysts want different elements of a firm's performance, no solitary logical method or sort of evaluation is appropriate for all scenarios (Karimi, 2013).

1.1.3 Commercial Banks Listed at Nairobi Securities Exchange (NSE)

According to Central Bank of Kenya, a commercial bank is an institution which conducts banking business in Kenya. There are 43 banks; whereby 30 are locally owned and 13 are foreign owned. The banks which are locally owned, comprises three banks with substantial shareholding by the state corporations and also the government of Kenya, 27 of them are commercial banks whereas one is a mortgage finance institution and Housing finance. The commercial banks listed in the NSE are 11 namely; ABSA bank Kenya, Stanbic Bank, Diamond trust bank group, Equity bank, Housing finance Kenya, I&M holdings limited, KCB, National bank of Kenya, NCBA, Stanchart Kenya, and Cooperative bank of Kenya (NSE, 2020). The Commercial banks in Kenya are usually governed by the Banking Act Chapter 488 (current edition handed over in September 2015), the Central Bank of Kenya Act (Cap, 491) and regular circulars and strategies issued often.

In comparison with the other Eastern African economies, Kenya's banking industry has for several years been credited for its dimension as well as diversity. Private credit to GDP, a common indicator of monetary development, was 23.7% in 2018, compared to an average of 12.3% for Sub-Saharan Africa.

1.2 Statement of the Problem

Commercial banks are predominant financial institutions and their changes in performance and structure have far reaching implications on the economy. The very nature of the banking

business is so sensitive since more than 85% of their liability is deposits from depositors. The current challenges facing the financial services industry includes customer retention, financial risk, legal and compliance risk, strategic risk, technological risk and stiff competition from MFIs, mortgage firms and SACCOs and online lending platforms (Cytonn, 2019). Due to the crisis-induced liquidity constraints, many financial institutions have been forced to shorten the maturity of their liabilities and are accordingly exposed to greater refinancing risk (KBA, 2019). The evidence of increased interest rate risk, combined with heightened regulatory attention, poses a fundamental question of how well prepared the financial corporations for changes in the interest rate environment are and what the most effective means are of managing financial risk (Central Bank, 2019).

Moreover, due to methodological differences and time horizons, past studies have yielded conflicting empirical outcomes on the various aspects of risk in Kenyan commercial banks. Muteti, (2014) and Odhiambo (2019) study on financial risk management in commercial banks was limited to a period of 5 years while the current study used a period of 10 years and thus the study presents a methodological gap. The study by Mutuku, (2016) on the effect of risk management on the financial performance of commercial banks in Kenya used internal control, capital adequacy and risk management environment as the key variables while the current study used operational risk, credit risk, market risk and liquidity risk thus presenting a contextual gap. In addition, many of the studies on financial risk on performance such as Mutuku (2016); Maniagi (2018); Odhiambo (2019) relied on primary data and questionnaires instead of secondary which thus creates methodological gaps.

In addition, the findings of Gathiga (2016); Muteti (2014); Mwangi (2014) showed a significant negative effect of financial risk on banks performance. Akonga (2014); Lukorito, Muturi,

Nyang'au and Nyamasege (2014); Tarus, Chekol and Mutwol (2012) results of the study showed that there is a significant positive relationship between banks performance and financial risk management. Whereas Gathiga (2016); Muteti (2014); Mwangi (2014) report the relationship between financial risk and financial performance to be positive, Akonga (2014); Lukorito, Muturi, Nyang'au and Nyamasege (2014); Tarus, Chekol and Mutwol (2012) obtain a negative relationship. This study sought to fill this gap, by examining the effect of financial risk on the performance of commercial banks in Kenya listed on the Nairobi Securities Exchange.

1.3 General Objective

The general objective of this study was to investigate the effect of financial risk on financial performance of commercial banks in Kenya listed on the NSE.

1.3.1 Specific Objective

This study was guided by the following objectives:

- i. To analyze the effect of operational risk on the financial performance of commercial banks listed on Nairobi Securities Exchange
- ii. To examine the effect of credit risk on the financial performance of commercial banks listed on Nairobi Securities Exchange
- iii. To establish the effect of market risk on the financial performance of commercial banks listed on Nairobi Securities Exchange
- iv. To assess the effect of liquidity risk on the financial performance of commercial banks listed on Nairobi Securities Exchange

1.4 Research Hypotheses

The study tested the following hypotheses;

H01: Operational risk have no significant effect on the performance of commercial banks listed on Nairobi Securities Exchange

H02: Credit risk have no significant effect on the performance of commercial banks listed on Nairobi Securities Exchange

H03: Market risk have no significant effect on the performance of commercial banks listed on Nairobi Securities Exchange

H04: Liquidity risk have no significant effect on the performance of commercial banks listed on Nairobi Securities Exchange

1.5 Justification of the study

1.5.1 Management of Commercial Banks

The management of commercial banks will have advanced knowledge on financial risk management in commercial banks in Kenya. This advanced knowledge will help them formulate and implement such important policies which will ensure that the effective risk management in commercial banks increases the revenues and give the firm a competitive edge. They will also be able to address the outstanding challenges of effective financial risk management in commercial banks.

1.5.2 Government and Regulatory Authorities

The Government, regulators and policy makers have a responsibility to ensure that public utilities for public benefits are well protected. Risk management in commercial banks is a complex activity and the successful completion of this study will furnish the government with relevant information that will enable it to make strict measures and policies that will help address the challenges of risk management in commercial banks. The study will provide findings and

recommendations that will aid the government with possible policy and regulations on financial risk management in commercial banks in Kenya.

1.5.3 Financial and Business Analysts

Analysts carry out a research on banks risk and performance and on issues affecting the commercial banks. The findings from this study will help them offer accurate information that will enable them to give informed decisions and offer appropriate advice to investors to make sound investment decisions.

1.5.4 Research and Development

Research and developments play very important roles in all economies. This research will be useful reference source for academicians and researchers interested in researching related academic areas. The study will also offer to provide a platform for constructive debate amongst academicians and provide a basis for further research.

1.6 Scope of the study

The study employed the use of secondary data available for the 11 listed commercial banks. The data was obtained from the published financial statements of the commercial banks which is available from NSE, websites of the respective commercial banks and the CMA. This research covered a period of 10 years from the years 2010 to 2019. The 10-year period was necessary so as to provide more observations and enable panel data analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter explores the theoretical review, empirical review, conceptual framework and the research gap. Finance theories relating to risk are discussed while empirical on operational risk, credit risk, market risk and liquidity risk are discussed in relation to financial performance. In addition, the conceptual framework, research gap and operationalization of the variables are presented in the chapter.

2.2 Theoretical Literature Review

This section explains some of the specific theories that can be related to the topic of study on the financial risk on the performance of commercial banks. The theories are Modern Portfolio Theory, Shiftability Theory of Liquidity and Agency Theory.

2.2.1 Modern Portfolio Theory

The Portfolio theory was developed by Harry Markowitz in the year 1952 and first presented in his seminal paper on portfolio selection. The theory has since been modified by several researchers to be what is now commonly referred to as the Modern Portfolio Theory (MPT). Portfolio theory points to a strategy for successfully balancing the goals of creating valuable loan assets and avoiding excessive risk concentration (Aruwa & Musa, A2014). An approved rationale among an expanding variety of financial institutions is that lending risk have to be managed not only at the individual customer level yet also at the profile degree. A well-capitalized, well-diversified lender typically can continue to be strong even when a number of debtors come across credit history problems (Al-Tamimi, Hussein, Miniaoui & Elkelish, 2015).

The model suggests that investors must diversify their portfolios to achieve maximum returns while at the same time reducing the risk in the portfolio. According to the portfolio theory, diversification is achieved through the allocation of resources to securities that promise maximum returns and minimum variance. Markowitz further posits that the securities with the highest expected returns are not necessarily the ones with the least variance. Due to the inter correlation of the securities' returns, diversification cannot eliminate all variance, and therefore the portfolio with maximum expected returns is not necessarily the one with the least variance (Adolphus, 2011).

The Portfolio theory portends that high-risk investments usually promise equally high- returns while low-risk assets equally promise low returns. All portfolios, therefore, exhibit all the characteristics of the individual assets used in their formation in terms of risk and return. Any investor who wishes to construct an optimal portfolio will be contending with a portfolio that neither promises the highest returns nor the lowest risk. The optimal portfolio will, however, seek to achieve a balance between the expected return and the acceptable level of risk (Miller, 2018).

The framework of portfolio theory includes numerous assumptions on investors and markets. While some of these assumptions are explicit, others are implicit (Mangram, 2013). The portfolio theory makes the following assumptions; investors are rational (they seek to maximize returns while minimizing the risk), investors have timely access to information pertaining their investments, markets do not charge transaction costs and no tax is applicable for the transactions, investors will only accept higher risk if the expected returns are high, investors can borrow or lend capital at the risk-free rate of interest, and markets are very efficient.

The Portfolio Theory is relevant to the study as it provides insights into how a bank should manage its operational risk, credit risk, market risk and liquidity risk exposures. Practical application of some of the concepts of portfolio analysis is possible if similar credit report scores are offered as well as if the effect on each car loan's rating of likely future occasions can be examined. If more limiting assumptions are made concerning which high quality dimensions of the portfolio are more crucial, and also if findings can be evaluated about what risk-return tradeoffs are acceptable, then it is feasible to obtain steps to lead exposure and rates choices.

2.2.2 Shiftability Theory of Liquidity

Harold Moulton developed Shiftability Theory of Liquidity in 1915. The theory holds that banks could most effectively protect themselves against massive deposit withdrawals by holding, as a form of liquidity reserve, credit instruments for which there existed a ready secondary market. The concept is based on the proportion that banks liquidity is kept if it holds properties that could be moved or marketed to other lending institutions or financiers for cash money. In addition, these assets could be changed to the Reserve bank for cash money without material loss in case of necessity than relying upon maturities to fix their liquidity troubles (Awojobi, 2011).

When the bank holds assets that can be changed or offered to various other lenders or investors for cash money, this concept posits that a bank's liquidity is preserved. This point of view competes that a bank's liquidity could be enhanced if it constantly has assets to market and also provided the Central Bank as well as the discount market stands ready to buy the asset used for discount (Berument & Dinçer, 2014). Thus, this theory acknowledges and competes that shiftability, marketability or transferability of a financial institution's possessions is a basis for making sure liquidity. This theory better competes that extremely valuable safety and security held by a financial institution is a superb resource of liquidity.

According to Dodds (1982), liquidity monitoring concept consists of the tasks involved in getting funds from depositors as well as various other creditors and identifying the ideal mix of funds for a specifically financial institution. The basic consensus is that throughout the period of distress, a bank may discover it tough to obtain the preferred liquidity because the self-confidence of the market might have seriously affected and credit report value would inevitably be doing not have.

The liquidity shiftability theory provides for understanding of how the liquidity risk and credit risk affects the financial performance using liquidity coverage and net stable funding ratios as stated by new Basel III framework. In addition, the liquidity shiftability theory is relevant to the study on management of liquidity risk in availing the liquid cash that is key for lending to the customers. Where the liquid money is not available for lending, this present a risk for the day to day operations of the Banks. The bank become distressed if they lack the necessary credit for lending and thus the theory brings the relevance of the motives to have the liquid credit for lending.

2.2.3 Agency Theory

The Agency theory by Jensen and Meckling (1976) postulates that an agency relationship is a contract whereby one or more parties –in this case the principal -engage the other party or agent to do a specific task on their behalf. By doing this, according to Jensen as well as also Meckling (1976) the concept delegates some authority to the representative to make some decisions on behalf of the concept. The presumption is that the objective of both the agent and the idea is to maximize utility. As a result, the representative might fall short to function as expected by the principal or in the principal's benefit (Alexiou & Sofoklis, 2019). Thus, in such an instance, the principal has to incur security prices as well as consist of rewards to inspire the agent. Generally, such acts restrict the principal's interests.

Adam Smith posits that supervisors of a company given that they handle the cash for other individuals as well as not their own cash-cannot be anticipated to have watchful monitor it as they would their very own (Jensen, 1976). Moral danger also develops owing to minimal responsibility which gives bank shareholders boosted risk cravings. Since the government secures bond owners, they often tend towards risk aversion and also reduced need of monitoring (Fapetu & Kolapo, 2015).

This theory is relevant to this study as managers make bank decisions which influence credit risk and/or financial performance. Agency costs incurred also affect the company's bottom line, which translates to profitability and overall bank performance.

2.3 Empirical Literature Review

2.3.1 Operational Risk and Performance

Lyambiko (2015) conducted a study to determine the operational risk management practices and financial performance in commercial banks in Tanzania and to identify the sources of operational risk exposures among commercial banks in Tanzania. The study adopted a descriptive research design a target population of 36 licensed commercial banks with a sample of the 36 commercial banks being analyzed. Secondary data was collected from the financial statements of commercial banks between 2009 and 2013. A regression model was developed with bank performance being measured by ROA and the independent variables consisting of credit risk, insolvency risk and operational efficiency. The research findings established that the independent variables had varying degrees of relationship with financial performance of commercial banks. The research confirmed that operational efficiency was positively correlated with the financial performance of commercial banks while credit risk and insolvency risk negatively influenced the financial performance of commercial banks.

Sewanyana (2011) conducted a study to establish the relationship between operational risk and organizational environment in Stanbic bank, to establish the relationship between organizational environment and organizational performance and to establish the relationship between operational risk and organizational performance in Stanbic bank in Uganda. Secondary data was obtained from existing firms' literature, council reports and journals. The research findings established that there was a positive and significant relationship between operational risk management, organizational environment and organizational performance. The regression analysis further revealed that operational risk management and organizational environment were significant indicators of organizational performance.

Kimani (2011) assessed fraud risk for Barclays Bank of Kenya and found that bank's statistics show that the frequency of internal fraud is increasing drastically and has by far inflicted the most significant losses to the bank. Since some unethical workers as well as managers have found methods to override systems as well as or collude with outsiders to defraud the bank, this is. According to the Bank's scams device, administration scams happens much less frequently but makes up the best economic losses. Placement equals power; managers as well as executives, having more accessibility to even more info and possessions than routine staff members as well as can commit fraud fairly less complicated without being noticed.

Francis and Hess (2014) analyzed how ASB Bank, a New Zealand-based retail financial institution, made price revenue proportion benchmarking between when assessing its operational efficiency. The study was carried out between August to November 2012. The research disclosed that though the expense earnings ratio was the principal metric made use of in this benchmarking exercise, it sought to identify best practice not in terms of decreasing this proportion yet rather in terms of recognizing common proportions and price frameworks amongst effective financial

institutions. The study observed that there is an inverse partnership between the expense income proportion and the bank's earnings.

Mathuva (2018) examined the relationship between capital adequacy, cost income ratio and the profitability of Kenyan Commercial Banks. The study used the return on assets as well as the return on equity as proxies for financial institution success for the period 2008 to 2017. The research found that Kenyan banks are not competitive sufficient worldwide in terms of their performance as gauged by the Cost-Income Ratio (CIR). The research shows that the cost-income ratio is adverse and also strongly considerable with productivity steps, indicating that extra effective banks produce higher revenues.

Tripe (2018), shows how an operational working capital charge (financial funding allotment) could be linked to volatility in the cost-to-income ratio, making use of several of the standard deviation of the proportion. Tripe also demonstrates how volatility in other actions, such as cost-to-assets, could be made use of to produce a financial capital fee. As described by Tripe, different cost-based proportions create considerably various capital costs. Better, the cost-to-assets proportion does not capture non-interest income though may be a leading sign of operational risk in a bank.

According to Epetimehin and Obafemi (2015), functional risk may materialize directly, for instance in electronic fund transfer (transfer of funds to the wrong individual) or could result indirectly as a credit history or market loss. Given that there is a close link of functional risk with various other types of risk, it is crucial for each institution to first have a clear understanding of the idea of operational risk prior to making the appropriate functional risk measurement and monitoring structure.

Santomero (2017) describes that operational risk relates to the concerns of exactly refining, taking as well as settling shipment on professions for the exchange of cash. It likewise involves the record keeping, refining system failures and satisfaction of the varied guidelines to make sure that, private operating problem is small portion for a well-managed establishment however triggers result which may be rather costly. Goldmann (2009) clarified that research study shows that interior fraud is dedicated by both staff members as well as management and also make up 50-80% of fraudulences committed in organizations. Employees have access to info, procedures, possessions and also systems as a result making it less complicated for them to tool ways of devoting fraudulence without being detected.

On the various other hand, the annual report of the Operational Risk data exchange Organization (2009) used the ratio operational occasions per million incomes to measure the lack of administration and/or guidance in a means that allows for a fair contrast of all banks, ignoring their dimension as well as focusing on wide range manufacturing. They suggest that depositors, that are the largest financial institutions to banks, may be of primary importance in this mechanism by exerting disciplinary stress on bank administration in terms of effectiveness improvements.

Odunga et al. (2013) investigated the effect of liquidity and capital adequacy on operating efficiency of commercial banks in Kenya. The outcomes show that previous year's functional performance, liquidity as well as resources competence integrated discuss regarding 41% of the bank's operating efficiency. Even more, total capital ratio and also fluid asset to deposits ratio positively impact running effectiveness of the banks. The other liquidity ratios- interbank proportion, loan proportion, internet lending to deposits proportion and also resources competence ratios - core resources proportion, risk based capital ratio and equity to total

possession ratio insignificantly effect running efficiency of the banks. We advise commercial banks to aim to raise their complete capital proportion in order to decrease their operational risk as well as consequently boost operational effectiveness. They need to enhance the proportion of liquid assets to down payments and short term funding in order to increase their functional effectiveness.

Sarmiento et al. (2013), using a non-parametric frontier model, found that Colombian banks improved in technical efficiency from 2000 up to the global financial crisis of 2007- 08, when efficiency and productivity decreased. They also located M&A to have a favorable as well as significant influence on bank efficiency, as well as high diversification in performance regardless of banks' size as well as association. Gal ´ an et al. (2015) estimated input-oriented technical efficiency throughout the period 2000-2009 utilizing a vibrant Bayesian SFA version. They figure out that foreign ownership has persistent and favorable effects on effectiveness of Colombian banks, while the results of dimension are favorable yet swiftly changed. They also recognized high ineffectiveness perseverance and essential distinctions between organizations. Particularly, merged banks were discovered to display affordable of change that allowed them to recuperate swiftly the performance losses stemmed from combining processes.

Moreno and Estrada (2013) studied the role of market power in explaining efficiency gains in Colombian banks during the 2004-2012 periods. By using different SFA and also nonparametric versions, they located a positive effect between market power as well as effectiveness, which is described by product distinction that allows banks to get effectiveness while they do not charge too much credit scores costs. Previous applications have actually not researched the influence of risk-taking on the performance of Colombian banks. Lyambiko (2015) study that determined the operational risk management practices and financial performance in commercial banks in

Tanzania and to identify the sources of operational risk exposures among commercial banks in Tanzania and the operational risk was negatively correlated with the financial performance of commercial banks while credit risk and liquidity risk negatively influenced the financial performance of commercial banks. Sewanyana (2011) study that establish the relationship between operational risk and organizational environment in Stanbic bank and the research findings established that there was a negative but insignificant relationship between operational risk management, organizational environment and organizational performance. The regression analysis further revealed that operational risk management and organizational environment were key indicators of organizational performance.

Oloo (2010) examined the relationship between operational efficiency and growth of commercial banks in Kenya. The research study aimed to check out whether the performance framework theory applies for Kenyan business banks. The study design was descriptive study style with a quantitative technique in order to create in- depth information from additional information as obtained from central bank of Kenya. The study was focused in the current performance of industrial banks in Kenya between the periods of 1998 to 2007. The study included 42 commercial banks operating in Kenya under certificate by the Central Bank of Kenya. This research study utilized accounting information of specific banks attracted from the years 1998--2007. The moment duration was selected thinking about that it uses recent time series monitoring and it constitutes a period of significant changes for the Kenyan banking system. The outcomes indicate the truth that growth in industrial banks is considerably affected by their performance in advancements.

According to Basak and Buffa (2015) by considering the easiest possible financial setup in which we integrate a notion of functional risk into, an optimum choice is formulated wherein the banks

which is our financial representative represent the visibility of functional risk. The financial institutions have to depend on a model to make investment decisions. Functional risk emerges from the insufficient application of these models that the financial institutions embrace to perform their financial operations. This inadequacy in execution can be triggered by various sorts of errors, errors in data collection and also handling as well as system programs codes.

Fadun and Oye (2020) evaluated effects of working risk management on financial performance: a scenario of office banks in Nigeria analyzed the influence of functional risk management methods on the financial performance of business banks in Nigeria. 10-years (2008 - 2017) second records drawn out coming from audited financial declarations of decided on commercial banks in Nigeria was actually used for the study. The records was actually analyzed utilizing the Linear Several Regression Model. The end results showed that there is a beneficial connection in between operational risk management and the financial performance of banks. The results uncovered that sound operational risk control techniques impact positively on the financial performance of banks. Our team, therefore, advise that banks' management need to set up ample sources towards comprehending operational risk to make sure sound operational risk administration and boosted financial performance of banks.

Muriithi (2016) investigated the effect of market risk, credit risk, liquidity risk and operational risk on financial performance of commercial banks in Kenya. The research study used additional information for one decade in between 2005 to 2014, which were extracted from the audited yearly documents of all the forty-three (43) qualified commercial banks in Kenya. Utilizing an out of balance panel data, the data gathered were studied using regression formulas. The forecasters looked at in the study feature market risk, liquidity risk, credit history risk and operational risk. Credit score risk was actually evaluated by asset premium, financing loss

regulation, finance & loan and also financing to risk weighted property; market risk was actually evaluated through financial take advantage of, rates of interest risk, overseas currency direct exposure; liquidity risk was actually step through liquidity coverage ratio, net steady backing and also working risk was actually gauged through price revenue ratio. The reliant variable, financial performance, was actually measured by ROE. The study concludes that assets risk, market risk, functional risk and also credit score risk all possess a negative significant influence on the financial performance of Kenyan business banks and also functional risk was highlighted to possess the best effect.

2.3.2 Credit Risk and Performance

Kithinji (2010) carried out a study to determine the relationship between credit risk management and profitability of commercial banks in Kenya. The study identified credit risk management as stringent, conservative, lenient and customized and globally standard credit risk management policies. Data non-performing loans and credit was collected from 2004 to 2008 with the amount of credit being measured by loans and advances to customers divided by total assets, non-performing was measured using non-performing loans divided by total loans and total profit was measured using ROA. A regression model was developed to explain the relationship between amount of credit, non-performing loans and profits during the study period. The R squared test indicated that 38.7% of profitability of commercial banks could be explained by amount of credit and non-performing loans. The adjusted R squared at -0.226 indicated that the amount of credit and non-performing loan did not explain the level of profit.

Li and Zou (2014) conducted a study to determine the relationship between credit risk management and profitability of commercial banks in Europe and ascertain whether the relationship is stable or fluctuating. The study obtained annual and risk reports for the selected

47 largest commercial banks in Europe between the period of 2007 and 2012 from which they obtained information on return on assets (ROA), return on equity (ROE) which were used as proxies of profitability while non-performing loan ratio (NPLR) and capital adequacy ratio (CAR) were proxies of credit risk management. The research findings established that credit risk management did not have a positive effect on commercial bank profitability. As with regards to credit risk management NPLR had a significant relationship on both ROA and ROE while CAR had an insignificant relationship on both ROA and ROE. The researcher further established that there was a fluctuating relationship between profit and credit risk management during the period under investigation. The researchers recommended that managers ought to put more effort on credit risk management specifically to control non-performing loans.

Aduda and Gitonga (2011) embarked on a study to determine the relationship between credit risk management and profitability of commercial banks in Kenya. The study adopted a descriptive research design with the target population being the commercial banks listed as at 31st December 2011. Both primary and secondary was used with structured and unstructured questionnaires being administered while secondary data was obtained from banks financial statements and annual reports between 2000 and 2009 from NSE library, bank secretaries and banks supervision department at the CBK. Bank profitability was measured using ROE with credit being measured using NPLR. The research findings obtained from the regression model indicated that there was an effect of credit risk management on profitability at reasonable level with 27.8% possibility of NPLR in predicting variance in ROE.

In Kenya a study by Wanjohi, Wanjohi & Ndambiri (2017) analyzed the effect of financial risk management on the financial performance of commercial banks in Kenya. The objective was to establish the effect of financial risk management on the financial performance of the commercial

banks in Kenya for five years (2008-2012). Primary data was used in this research where, a self-administered survey questionnaire was used across the banks. The study used multiple regression analysis was used risk measurement risk management environment, risk monitoring and adequate internal control had a positive correlation to the financial performance of commercial banks in Kenya. This research concluded that financial risk had a strong impact on the financial performance of commercial banks in Kenya.

Mohammad (2008) undertook an inspection on risk management in Bangladesh Banking Market. His major goal was actually to look into the payment of credit report risk on non-performing loans. He found that, the center of the issue is located in the selection of significant degree of non-performing findings over a significant bunch of time. Depending on to him other than if NPL proportion of the country may be reduced generously they will lose hostile edge in the surge of globalization of the managing an account benefit that is actually taking place all via the globe. Since they have possessed a two-decade lengthy engagement in handling the NPLs problem and a lot is actually dealt with the sources as well as cures of the problem, he rationalized that it is actually necessary for the banks, customers and also policy makers to pick up from recent experience and act correctly.

Wanjiram (2010) conducted a study on the connection between non-performing loan management practices and financial performance of commercial bank in Kenya. The examination presumed that there is a demand for business bank to obtain nonperforming lending management methods. Such methods include assuring sufficient promises, limiting loaning to different kind of institutions, loan securitization, promising crystal clear appraisal structure of loaning offices and utilization of techniques in deciding on dangerous lending amongst others. The inspection furthermore presumed that there was actually a positive connection in between

non-performing lending monitoring practices as well as the financial performance of industrial bank in Kenya which proposes that the option of non-performing lending monitoring techniques motivates improved financial performance of commercial bank in Kenya

Aboagye and Otioku, (2010) led an investigation on Credit Risk Management and Profitability in financial institutions in Sweden. The vital goal was to learn whether the control of the dangers understood that credit scores determines the profits in financial establishments. They discovered that credit rating possibility monitoring in financial institutions has actually become more important certainly not simply in lighting of the financial urgent that the globe is actually facing nowadays yet in enhancement the presentation of Basel II. They wrapped up that given that offering credit history is actually one of the major roots of wages in financial organizations, the management of the threats related to that credit scores influences the earnings of the monetary associations (Aboagye & Otiokun, 2010).

Khan and Ahmad (2001) conveyed an examination on risk emerging from investment deposits. The standard purpose of the research was actually to find out whether bankers considered these exceptional risk much more authentic than popular threats looked through money associated structures. The findings displayed that odds degree is considered as raised. They assumed that the higher viewpoint of threats could be an indication of the low degree of vibrant risk monitoring as a result of the overlooking of threats handle via inside techniques as well as command, especially therefore credit rating odds.

Kithinji (2010) analyzed the effect of credit risk predicted by the proportion of loans and car loans on aggregate resources and also the percentage of non-performing financings to amount to car loans and also findings on revenue for aggregate resource in Kenyan banks from 2004 to 2008. The results exposed that the principal component of the incomes of commercial bank are

actually certainly not affected due to the step of credit history as well as non-performing car loans. The research offers the reasoning to think about various variables that can have an effect on bank's performance and additionally a more extended time of the examination to catch the genuine photo of the banks' performance. Thus this exam incorporated the result of assets and market risk as aspect of financial risk.

Kargi (2011) determined the result of credit risk on the success of Nigerian banks. Financial proportions as portions of bank performance and credit risk were compiled coming from the annual reports and also files of sampled banks from 2004-2008 as well as checked out taking advantage of informing, partnership as well as relapse tactics. The looking's for showed that credit possibility administration significantly impacts the profitability of Nigerian banks. The looking's for of the study disclosed that banks' productivity is vice versa affected through the levels of financings and also car loans, non-performing finances as well as shops thus showing them to remarkable risk of liquidity and also difficulty. The substantial exam of credit risk consisting of cash-flow to possibility heavy resource proportion should possess been taken into consideration.

Poudel (2012) checked out different specifications applicable to recognize risk administration as it determined financial establishments in Nepal utilizing guidelines, default cost, cost every car loan possessions and financing adequacy proportion. Relationship and also regression styles were made use of to assess the information where the study revealed that all these parameters possess an inverted influence on banks' financial performance. Review of t-test indicated that there is actually notable negative partnership between return on resources and individual changeable which are actually default rate as well as funds adequacy ratio.

Onaolapo (2012) reviewed the connection in between credit risk management effectiveness as well as financial health and wellness in selected Nigerian commercial financial sector. Data selections are mostly additional stretching over a 6-year period before and also after unification programme (2004 to 2009). The exam thought adverse relationship between Effectiveness of Credit Risk Management, bank performance and also operational effectiveness. The study used regression analysis and also system embed test was actually made use of validate order of combination for each and every opportunity set information worked with. Looking for show unimportant causation between Deposit Direct exposure (DE) as well as performance having said that much more prominent dependence on operational efficiency guidelines.

Ogboi and also Unuafe (2013) assessed the effect of credit risk and also funding adequacy on banks financial performance in Nigeria. Their inspection took advantage of time series and also traverse separate information coming from 2004-2009 from selected banks annual files and also records in Nigeria. Additional records for the exam were obtained coming from the financial claim of 6 away from twenty one banks working as at December 2009 which were actually chosen through calculated testing technique. Door data design was taken advantage of to gauge the partnership that exists one of loan bad luck plans (LLP), deposits and allowances (Los Angeles), nonperforming accommodations (NPL) and also funds ampleness (CA) which were actually the totally free elements and also income for source (ROA) as the needy variable to measure the productivity of the banks. The searchings' for showed that sound credit odds administration and also resources sufficiency affected emphatically on bank's loan associated performance other than loans and also loans which was actually discovered to adversely impact banks' profitability amidst that time frame.

Marshal and Onyekachi (2014) carried out a speculative examination on the impact of credit risk as well as performance of banks in Nigeria over the moment of 15- years (1997-2011) on five always keeping financial firms. Data were sourced coming from the annually documents and reports articulations/sheets of the banks in the example which was time series and cross sectional information and evaluated using door records regression methods. The result demonstrates that there is actually a favorable relationship between Ratio of non-performing findings to finances and also deposits (LogNPL) and also banks performance (LogROA). Their assessment shown that banks in the examination convey an extremely irrelevant level of nonperforming allowances in their credit profile and also correctly this carries out certainly not adapt to from the earlier needs. Their discoveries were actually furthermore that there exists a beneficial relationship in between portion of credit and allowances to amount to establishment (LogLA) and banks performance (LogROA). The conclusion was that boost in car loan and also accommodations enhances banks performance via enthusiasm revenue generated from financing and also accommodation.

2.3.3 Market Risk and Performance

Wachiaya (2011) carried a survey to identify the market risk management techniques used by commercial banks in Kenya and their suitability in mitigating financial loss. The research study style embraced in the research was a descriptive study. The populace utilized consisted of the 43 business financial institutions accredited to operate in Kenya as listed by the Central Bank of Kenya. Main information collection with making use of a set of questions was utilized to gather information from the target population laying out concerns relevant to the research. Mark-to-market of securities was made use of somewhat. The significant findings for was that limitations made sure management of risk exposure within the bank's risk appetite. Other reasons were

restrictions made certain financial institutions took acceptable limitations as authorized by the investors and also there was prudent management of market risk. Other minor reasons were to guarantee prudent management of the bank's assets and also liabilities as well as for keeping track of purposes (Wachiaya, 2011).

Nimalathan *et al.*, (2012) examined the impact of systematic risk management on profitability of selected financial institutions in Sri Lanka from year 2007 to 2011. In their research, systematic risk management measured in Level of Financial leverage (DFL) and Level of Operating utilize (DOL) as independent variable as well as Earnings (i.e., Net Earnings, Return on Capital Employed (ROCE) and also Return on Equity (ROE) as the reliant variable. The research likewise indicated that organized risk administration is enhanced by DFL and also DOL in the picked financial establishments where the helpful effects are observed on success. The findings for of their study was that degree of economic leverage was inversely associated to profitability while running take advantage of is positively relevant to productivity.

Abid and Mseddi (2004) additionally analyzed the degree of running operating leverage of and the level of financial leverage for company in USA for a period of 5 years and checked out the organization in between the risky nature of the companies and the loved one value. The research determined a positive result on company worth of both operating and also economic utilize definition that with the surge in the various levels of utilize of the companies in US the worth of the firm likewise boosts which is obvious as a result of the benefit financial debt as a capital. The study additionally located that the excess return is a positive as well as raising feature of running leverage, level of financial utilize and also organized risk for sample companies that reveal a favorable relationship of sales adjustments with market profile returns. Kithinji (2010) whose study to determine the relationship between credit risk management and profitability of

commercial banks in Kenya and established that credit risk had a significant negative effect on financial performance of financial institutions. Li and Zou (2014) study that determined the relationship between credit risk management and profitability of commercial banks in Europe and ascertain whether the relationship is stable or fluctuating. The research findings established that credit risk management did not have a positive effect on commercial bank profitability. As with regards to credit risk management NPLR had a significant relationship on both ROA and ROE.

Wachiaya (2011) who carried a survey to identify the market risk management techniques used by commercial banks in Kenya and their suitability in mitigating financial loss and the significant findings was that limitations made sure management of risk exposure within the bank's risk appetite. The study by Ngalawa and Viegi (2013) study showed that bank's exposure to interest rate risk or income gap determines the structure of the balance sheet. The study discovered that in Kenya, industrial financial institutions typically retain a huge direct exposure to interest prices that can be predicted through the earnings gap.

Ngalawa and Viegi (2013) study showed that bank's exposure to interest rate risk or income gap determines the structure of the balance sheet. They examined rate of interest price level of sensitivity gaps obtained from monetary reports for 10 industrial banks detailed in the Nairobi protections exchange for the period 2008-2012. The study discovered that in Kenya, industrial financial institutions typically retain a huge direct exposure to interest prices that can be predicted through the earnings gap.

2.3.4 Liquidity Risk and Performance

Mwangi (2014) carried out a study to determine the effect of liquidity risk management on the financial performance of commercial banks in Kenya. A descriptive research design was adopted

with the target population being the commercial banks. Secondary data was obtained from published accounts of commercial banks which included statement of financial position, income statement and other disclosures between 2010 and 2013. A regression model was developed with bank performance being measured using the ROA whereas the independent variables were: liquid assets to total assets, liquid assets to total deposits, balances due to other banks /total assets and asset quality. The research findings concluded that liquidity risk management had a significant negative relationship with commercial bank performance.

Maaka (2013) carried out a study which was pegged on two objectives: To investigate the liquidity faced by commercial banks in Kenya and to establish the relationship between liquidity risk and the performance of banks in Kenya. The study incorporated a correlation research design with data being gathered between 2008 and 2012 from annual reports obtained from the CMA and NSE with a sample of 14 banks being analyzed. A regression model was developed with the dependent variable being PBT and the independent variables consisting of deposit, cash, liquidity gap and non-performing loans. The research findings established that profitability was negatively affected due to increase in liquidity gap and leverage. The level of customer deposit was found to positively affect banks profitability.

Konadu (2019) conducted a study to determine the liquidity trends of selected banks so as to ascertain the profitability trend of the selected banks with the aim of analyzing and establishing the relationship between bank liquidity and profitability levels in Ghana. Data was collected between 2016 and 2019 from commercial banks listed at the Ghanaian Stock Exchange which included Standard Chartered Bank Ghana Ltd, SG-SSB Ltd and Cal Bank Ltd. The liquidity ratios used for the study were cash ratio, current ratio, quick ratio and net operating cash flow ratio whereas the profitability ratios consisted of net profit margin, return on assets, return on equity

and net asset turnover. Trend analysis was adopted so as to achieve the set objective. The research findings established that there was no positive relationship between liquidity trend and profitability whereas a negative relationship existed between liquidity and bank profit in Ghana.

Ogol (2011) did a research on liquidity risk management practices in microfinance institutions in Kenya. The focus of the research was on understanding the process of liquidity risk identification by MFIs, the extent to which MFIs are categorized, monitor liquidity risk, liquidity risk direct exposure of MFIs as well as to recognize the different techniques that the MFIs embrace in taking care of the liquidity risk. Making use of a detailed research design, main information was accumulated with questionnaires dispersed to MFIs operating in Nairobi City. Information collected was analyzed by utilize of detailed stats and SPSS variation 17 was made use of for the objective of the evaluation. Results suggested that MFIs have in place liquidity risk administration methods.

Doriana (2013) considered the determinants of bank liquidity inside the European location. The intended of the exam was to scrutinize the kind of relationship that exists in between liquidity risk, assessed along with the liquidity protection ratio and the web steady backing proportion, and also some particular bank construct variables-size, capital, resources quality as well as field of expertise. The inspection uncovered that much bigger banks have a much higher liquidity possibility introduction, while keeps amount of money with greater capitalization existing a superior liquidity on lengthy horizon. The perks top quality impacts only on the portion of the fleeting liquidity risk. In order to the specialization, banks extra details on the lending activity displayed a much more unarmed supporting design. The study additionally discovered that throughout the financial crisis, the liquidity risk administration modifications just on the temporary horizon.

Kamau, Erick and also Muriithi (2013) analyzed the areas affecting liquidity level of business bank in Kisumu city, Kenya. The research attempted to investigate whether aspects interior as well as aspects external to industrial bank determines liquidity amount of office banks in Kisumu Metropolitan area. The exam uncovered that ranges in liquidity amount are brought on by both internal and also outside aspects. The inner aspects discovered notable in figuring out liquidity degree of commercial banks were contingency organizing, profitability, banks major commitments and control policies. The exterior factors located to become significant factors of liquidity were credit rating, financial policies, federal government cost as well as balance of settlement status. A study conducted to evaluate the relationship in between liquidity risk as well as financial performance of commercial banks in Kenya, sought to explore liquidity risk dealt with through commercial banks as well as to establish the relationship in between liquidity risk and also the performance of banks in Kenya. It was actually found that productivity of the commercial bank in Kenya is detrimentally had an effect on as a result of enhance in the liquidity void and also utilize. Along with a considerable liquidity gap, the banks may need to acquire from the repo market even at a much higher cost thus driving up the cost of banks. The degrees of customer down payments were actually located to favorably affect the bank's profits (Maaka, 2013).

The relationship between liquidity risk can be estimated with two new liquidity markers proposed by the Basel Committee; liquidity inclusion proportion and net stable financing proportion, some monetary record lists - the common logarithm of aggregate resources, the proportion between advances to clients and aggregate loans and some macroeconomic pointers GDP yearly development rate, the spread between the interbank rate and national bank approach rate (Angora and Roulet, 2011). Their study discovered that the liquidity risk proportion has a

negative association with a large portion of the markers broke down including size and the proportion between administrative capital and aggregate resources, while the liquidity measure has a huge and positive association with macroeconomic factors, for example, GDP and the national bank policy rate.

Rauch, Steffen, Hackethal, and Tyrrel (2010) investigated the determinants of liquidity risk and endeavored to distinguish the determinants of liquidity creation. Their outcomes feature that the most critical determinants are macroeconomic factors and financial arrangement, while not demonstrating a huge connection between liquidity creation and bank particular factors, for example, size and performance. They additionally discovered that capitalization estimated by the proportion among value and aggregate resources has a noteworthy and positive association with liquidity and a unimportant association with expansion rate and development rate. Liquidity risk estimated utilizing fluid advantages for aggregate resources proportion, broke down the determinants of liquidity danger of banks from developing economies. The outcome demonstrated that the extent of a bank positively affected liquidity risk, the proportion of value to resources as a proportion of capital sufficiency negatively affected liquidity chance. The nearness of prudential control convincing banks to be fluid enough, the offer of open use on GDP as a proportion of supply of moderately fluid resources and the rate of expansion which builds the helplessness of banks to ostensible estimations of advances gave to clients were found to have negative impact on liquidity risk. The relationship between assets growth and financial performance was also found to be positive and significant (Bunda & Desquilbet, 2008).

Ogbada as well as Osuji (2013) checked out on the feasibility of liquidity control and also financial performance in Nigeria. Survey style via structured questionnaires was made use of to gather records. The example of the study was composed of twenty aimlessly decided on banks in

Nigeria where 300 bank workers acquired through aimlessly dispersed surveys to every. Coming from their observational examination they discovered that there is critical hookup in between skilled liquidity administration and financial performance. Majid (2003) furthermore concentrated on reasonability regimen when it comes to liquidity administration where in their exam on threats monitoring, guidance as well as direction of Islamic banks in Jakarta-Indonesia. They insinuated that lack of ability to take care of liquidity administration has cued conserving loan crumple and to enlargement insecurity in financial structures.

Mwangi (2014) whose study to determine the effect of liquidity risk management on the financial performance of commercial banks in Kenya found that liquidity risk management had a significant negative relationship with commercial bank performance. This study demonstrates the importance of the liquidity risk management in influencing the income statement of the commercial banks in Kenya, thus it can be concluded that managers who ought to increase the earning of their company should keep an eye on the item that are likely to alter the liquidity of their firms. More importantly, the loan proportion given by banks need to be maintained at a manageable level so as to boost the profitability in cases of short falls. Maaka (2013) study on the liquidity faced by commercial banks in Kenya and relationship between liquidity risk and the performance of banks in Kenya found that profitability was negatively affected due to increase in liquidity gap and leverage. The level of customer deposit was found to positively affect banks profitability. Further the findings are in line with Konadu (2019) study that determined the liquidity trends of selected banks so as to ascertain the profitability trend of the selected banks with the aim of analyzing and establishing the relationship between bank liquidity and profitability levels in Ghana and established that there was no positive relationship between

liquidity trend and profitability whereas a negative relationship existed between liquidity and bank profit in Ghana.

Njeri (2013) carried out examine on the influence of liquidity on financial performance of down payment taking small finance companies. Detailed research style was made use of to study secondary records of 5 years from 2009-2013 utilizing multiple regression design. From the examination it is actually precisely that financial performance of the MFIs in Kenya is actually greatly trusted the degree of institutional liquidity. Thereby MFIs need to improve their liquidity position to acknowledge increased and also practical money similar performance. Weaker financial stewardship, unacceptable financing framework and imprudent funds appropriation has been actually presented as some of the variables being dangerous development of SACCOs. These aspects have actually weakened the productivity and also durability of development of SACCOs.

2.4 Research Gaps

From the foregoing review of relevant literature, it is evident that research in the area of bank risk has been done but not in a comprehensive approach. Due to methodological differences and time horizons, past studies have yielded conflicting empirical outcomes on the various aspects of risk in Kenyan commercial banks. Muteti, (2014) and Odhiambo (2019) study on financial risk management in commercial banks was limited to a period of 5 years while the current study used a period of 10 years and thus the study presents a methodological gap. The study by Mutuku, (2016) on the effect of risk management on the financial performance of commercial banks in

Kenya used internal control, capital adequacy and risk management environment as the key variables while the current study used operational risk, credit risk, market risk and liquidity risk thus presenting a contextual gap. In addition, many of the studies on financial risk on performance such as Mutuku (2016); Maniagi (2018); Odhiambo (2019) relied on primary data and questionnaires instead of secondary which thus creates methodological gaps.

In addition, the findings of Gathiga (2016); Muteti (2014); Mwangi (2014) showed a significant negative effect of financial risk on banks performance. Akonga (2014); Lukorito, Muturi, Nyang'au and Nyamasege (2014); Tarus, Chekol and Mutwol (2012) results of the study showed that there is a significant positive relationship between banks performance and financial risk management. Others such as Maniagi (2018) had mixed findings where the relationship between interest rate risk and market risk and performance was significantly negative and the relationship between banks performance and credit risk was significantly positive. Whereas others report the relationship between financial risk and financial performance to be positive, others obtain a negative, while other researchers obtain a mixed relationship (both positive and negative). This study thus sought to fill this gap, by examining the effect of financial risk on the performance of commercial banks in Kenya listed on the Nairobi Securities Exchange.

2.5 Conceptual Framework

The framework illustrates how variables are linked and related to each other. The variables, in this case, are the independent (explanatory) along with the dependent variable (response). Notably, an independent variable affects and determines the effect of another variable. The figurative illustration of the dependent and independent variables in this study is shown in the conceptual framework.

Independent variables

Dependent Variable

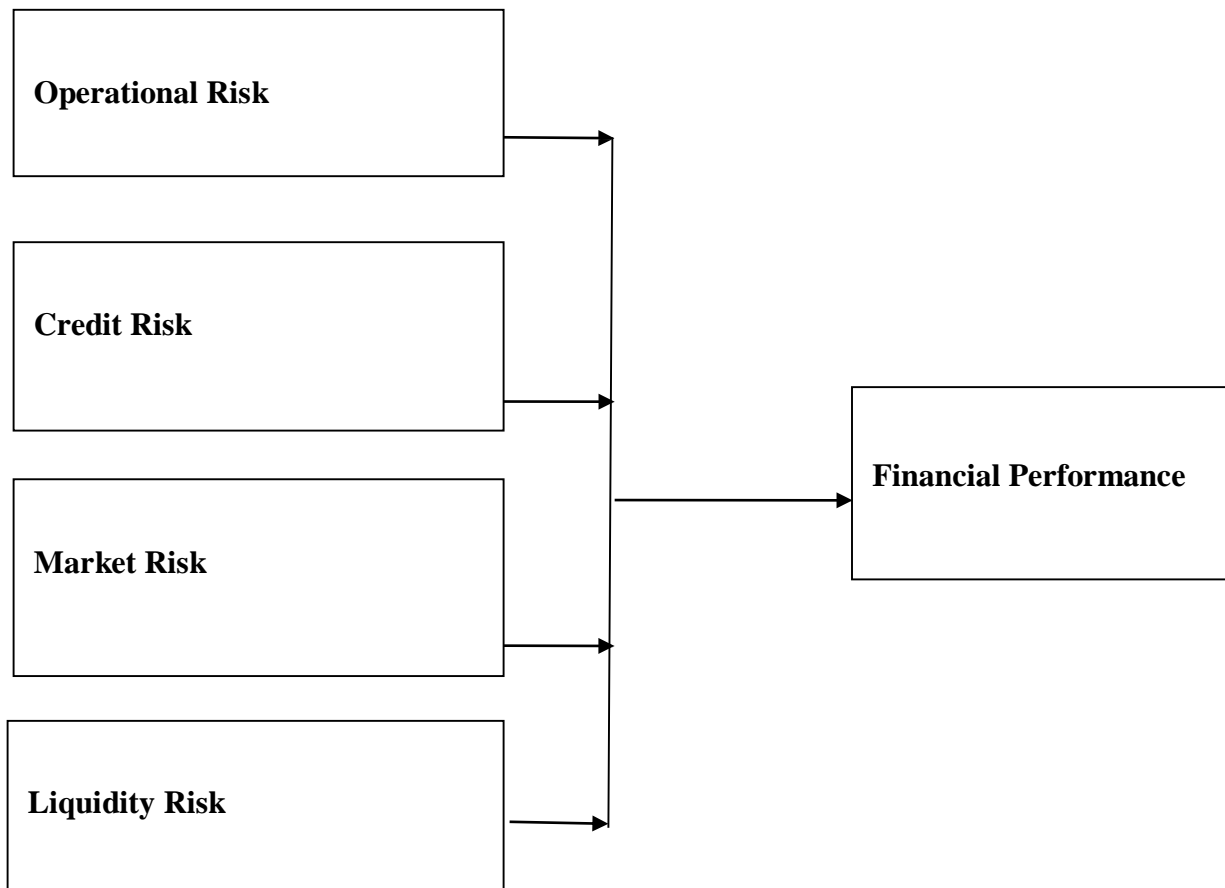


Figure 2.1: Conceptual framework

The independent variables are the financial risk that the commercial banks are exposed to. They include operational risk, credit risk, market risk and liquidity risk. The independent variable was financial performance which is denoted by Return on Assets (ROA). Return on assets (ROA) was used to measure financial performance of the commercial banks since it an effective method to measure how the bank is in converting the money it invests into net income.

2.6 Operationalization of Variables

The section presents how the independent and dependent variables was operationalized and as shown in Table 2.1.

Table 2.1: Variables Operationalization

Variable	Variable Type	Measurement	Scale
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Financial Performance	Dependent	Return on Assets (ROA) Net Income / Total Assets	Ratio
Operational Risk	Independent	Basic Indicator Approach Capital Charge/Gross Income	Ratio
Credit Risk	Independent	Impaired Loans/Total Assets	Ratio
Market Risk	Independent	Risk Sensitive Assets/ Liabilities	Ratio
Liquidity Risk	Independent	Total Loans/Total Deposit	Ratio

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sets to discuss the methodology to be adopted by the researcher attempting to answer the research queries. Specifically, the chapter included research design, target population, and data collection. Additionally, the chapter presents the data analysis techniques to be adopted and diagnostic tests to be performed.

3.2 Research Design

The study adopted descriptive research design approach. Mugenda and Mugenda (2003) assert that descriptive research design is applicable majorly when the objectives of the study are systematic. The design further aims at exploring the nature of the factors that are involved in a given situation and to ascertain the degree of the association between the variables under study. This research design is preferred for this study because the research sought to study the existing phenomenon of the variables with no intention of manipulating any variable.

3.3 Target Population

McBurney and Theresa (2010) define population as the aggregate or totality of all the subjects, members or objects that conform to a given set of specifications. Also, Ngechu (2004) asserts population as a defined set of things, elements, people and items to be researched on. Currently, there are 11 listed commercial banks at the NSE which formed the target population of this study. The 11 commercial banks at the NSE are tabulated below.

Table 3.1 Target Population

No	Bank
1	ABSA Bank Kenya
2	DTB Kenya
3	Equity Bank Kenya
4	HFCK
5	I&M Bank
6	KCB Bank
7	NBK Bank
8	NCBA Bank
9	Stanbic Bank

10	Standard Chartered Bank Kenya
11	Co-operative Bank Kenya

Source: www.nse.co.ke 2020

3.4 Sample and Sampling Techniques

Sampling is a process which enables a researcher to gather a few things or people together that represent the characters of the whole population under study. (Blumberg, Cooper & Schindler, 2014). According to McMillan and Schumacher (2014), census is a study where all members, objects or things in the population take part in the research. Census technique is suitable when the levels of accuracy and reliability required in the study are very high. Additionally, census is preferred when the members of the population are few. This research used a census technique to study the 11 listed commercial banks at the NSE.

3.5 Data Collection

The research adopted the use of secondary data. The data was extracted from the NSE and the websites of the respective listed commercial banks. The main source of data was the published financial statements of the 11 listed commercial banks at the NSE. Data was collected covering 10 years from 2010 to 2019 so as to provide more observations and also enable a panel data analysis. The published statements are reliable because all listed companies are required by law to report their audited statements as well as stating their compliance with performance principles.

3.6 Data Analysis

Etikan Musa and Alkassim (2016) define data analysis as a process that reviews, converts and displays data to bring forth important information, and suggest conclusions to the researcher for purposes of decision making. Brooks (2008) asserts that panel data regression is preferred in conditions where the data at hand comprises both time series and cross-sectional components.

This is because panel data can address a wider range of issues and more sophisticated problems than the classic cross-sectional data or the perfect time-series. Gujarat (2004) considers panel data to be desirable because it incorporates more information in the model, that is, it combines variability across time and cross-section units. Subsequently, this research model is focused on panel data approach where the cross-sectional component is reflected by the commercial banks while the time-series component is reflected by the period of study (2010-2019). The research utilized a panel regression model using STATA software. The study adopted the use of panel regression analytical model as shown;

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it}$$

Where;

Y= Financial Performance

β_0 = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Beta coefficients of the independent variables

X_1 = Operational Risk

X_2 = Credit Risk

X_3 = Market Risk

X_4 = Liquidity Risk

ε = Error term (Margin of error)

i = Bank company. i = 1...5

t = the index of time period. t = 1...5

3.7 Diagnostic Tests

According to Mutandwa, Gala and Grebner (2016), the data collected must first be assessed before the actual estimation of the model. The tests must be conducted to find out whether the data has met the assumptions of regression models since any data contravening the presumptions of the panel regression yielding spurious outcomes. This study used autocorrelation tests, heteroscedasticity tests, multi collinearity tests, and normality assumptions to evaluate the data collected before the actual analysis.

3.7.1 Autocorrelation Test

Autocorrelation occurs when data seem to pick up on a certain trend over time. The data, in this case, produce some similarities in the rates of change over successive periods of time. Models with autocorrelation suggest that they are well defined which suggests that the key variable(s) are missing from the model. Autocorrelation has no influence on un-biasness and linearity of the estimators. The only known consequence is that it contravenes the attributes of the Ordinary Least Square (OLS), which culminates to wrong outcomes in hypothesis testing (Gujarati, 2004). The study used Breusch Godfrey test to ascertain whether the data collected has a serial autocorrelation.

3.7.2 Heteroscedasticity Test

In regression models, the error term difference or variance is assumed to be constant across observations. If this assumption is violated, the random variable is called heteroscedastic. If the control model is heteroscedasticity, then the analysis is not correct. According to Williams (2016), heteroscedasticity gives equal weight to all observations and causes the standard errors to be discriminated and consequently results in an incorrect conclusion when testing the hypothesis. This study used Breusch-Pagan test to check for existence of heteroscedasticity in the data collected.

3.7.3 Normality Assumptions

According to Kothari (2004), the normality assumption is the possibility that the gathered data was normally distributed over the sampled population. Brooks (2008) adds that normality tests are executed to evaluate whether the data set is well represented by a normal distribution. Linear and panel regression models presume that the error term is normally distributed at a mean of zero and constant variance. Once the data is confirmed to meet the normality assumption test, ordinary least square estimation can easily be developed and would be much more accurate. The Bell-shaped histograms portend that data is normally distributed and accordingly fit for OLS estimation.

3.7.4 Multi collinearity Test

Iacobucci *et al* (2017) define multi collinearity as a test that determines whether two or more variants are directly related in a regression analysis. The intensity of the association between variables is assumed to be between 1 and -1. Where 1 denotes perfect positive association, -1 expresses a perfect negative association while a coefficient nearing zero suggests a weak interrelationship between the variables. Multi collinearity problems arise when the correlation between the explanatory variables is greater than 0.75 (Malhotra, 2007). However, Gujarati (2004) argues that what matters most is the degree of the multi collinearity and not its presence or absence. Consequently, this study adopted Field's (2009) recommendation that variables greater than 0.9 should be avoided and hence the research would flag any combinations that are higher than 0.9 for elimination. Additionally, to test for multi collinearity, Variance inflation factors (VIF) test was used.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.0 Introduction

This chapter presented the patterns of the results and their analyses as to their relevance to the objectives and hypotheses. The findings are presented in tables and narrations as per the specific objectives. The chapter presents descriptive statistics, the pre-estimation and post-estimation tests. The chapter further presents the results of the models that was adopted in order to achieve the study's objective.

The data was obtained from the financial statements of the selected firms from the NSE. The data was also checked for completeness and any outliers from excel before importing to STATA where it was set to panel balanced data. As per the operationalization of our study variables, financial performance (ROA) was obtained from net income / total assets while operational risk was obtained from capital charge/gross income. Credit risk ratio was obtained from impaired loans/total assets, market risk ratio was obtained from risk sensitive assets/ liabilities while liquidity risk ratio was obtained total loans/total deposit.

4.1 Descriptive Statistics

Table 4.1 shows the mean, standard deviation, minimum and maximum values of the variables operational risk, credit risk, market risk and liquidity risk for the listed banks at the Nairobi Securities Exchange for the period 2010-2019. This was presented in ratio as shown in Table 4.1.

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	110	2.690	0.803	0.910	3.940
Liquidity Risk	110	0.560	0.609	0.010	0.800
Credit Risk	110	0.200	0.058	0.100	0.370
Market Risk	110	0.199	0.0595	0.100	0.2990
Operational Risk	110	0.1989	0.0567	0.1020	0.3300

The results indicated that the return on assets had a mean of 2.690 and a standard deviation of 0.803. The minimum ratio was 0.91 and the maximum of 3.94. The mean of 2.690 implied that most of the banks were able to mobilize their assets to get profits from it. However, the return on assets of less than 1 indicated that some of the banks were not able to generate adequate profits from their assets. The results further indicated that the liquidity risk had a mean of 0.560 and a standard deviation of 0.609. The minimum ratio was 0.010 and the maximum of 0.800. This implied that most of the banks had adequate liquidity to cover loans in the event of an economic downturn resulting in loan defaults.

Further, the results indicated that the credit risk had a mean of 0.200 and a standard deviation of 0.058. The minimum ratio was 0.100 and the maximum of 0.37. This implied that majority of the banks had managed to control the credit risk at 20% given the hard economic times when loan impairment is likely. The results indicated that the market risk had a mean of 0.1994 and a standard deviation of 0.0595. The minimum ratio was 0.1020 and the maximum of 0.2990. This implied that the banks had maintained the risk sensitive assets to liabilities at a higher ratio to mitigate the market risk. Lastly, the results indicated that the operation risk had a mean of 0.1989 and a standard deviation of 0.0567. The minimum ratio was 0.1020 and the maximum of 0.33. This implied that the capital charge to gross income was favorable for most banks for their operations.

4.2 Trend Analysis

This section presents the analysis of the trends of the variables. The study conducted a trend analysis to establish the movement of the variables overtime for the listed banks at the Nairobi Securities Exchange for the period 2010-2019. This is as shown in Figure 4.1.

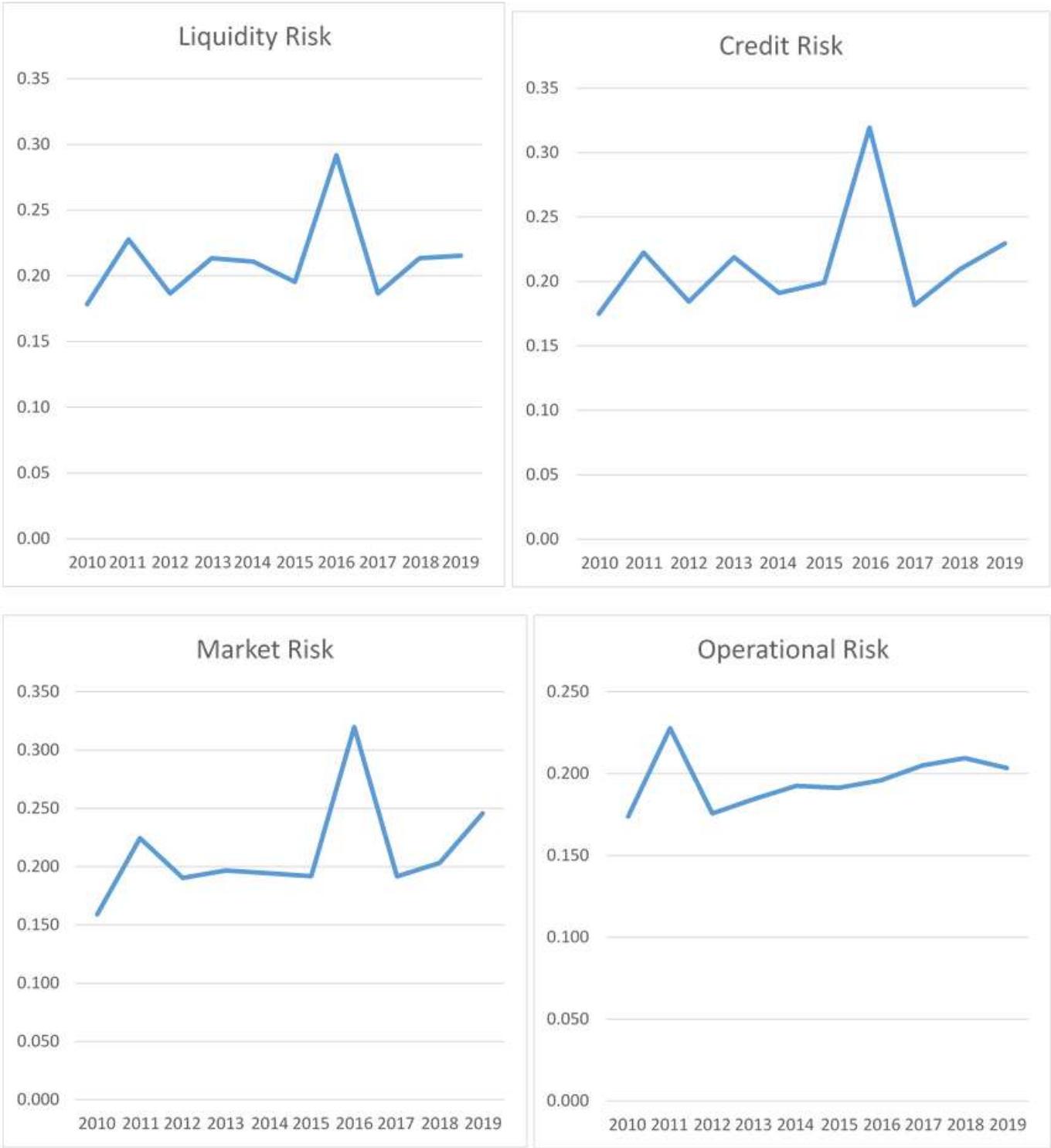


Figure 4.1: Trend Analysis

The trend line in Figure 4.1 shows that liquidity risk for the listed banks had a small varying movement between 2010 and 2015. However, in 2016, there was a sharp rise in the liquidity risk and this can be associated with the interest rate capping by Central Bank in 2016 that raised the difference between interest-earning assets and liabilities. However, the trend recoded a downward trend from 2018 and 2019. The trend line for credit risk indicates a similar effect from that of liquidity risk where from 2010 to 2015, the trend was varying in small movements but had a sharp rise from 2016 and 2017. The trend however came down in 2018 with a slight increase in 2019.

The trend for market risk indicated a rise from 2010 to 2011 but thereafter stagnated up to 2015. However, in 2016, there was a sharp rise in the trend that could have been caused by the increase of the risk sensitive assets in relation to the liabilities caused by the interest rate capping. Lastly, the trend for operational risk had a rise in 2011 and drop in 2012. The trend from 2013 to 2019 had a fairly stable increase implying that the capital charge over gross income had recorded minimal variance.

4.3 Diagnostics

The study conducted out different diagnostic tests to make sure that the postulations of Classical Linear Regression Model (CLRM) are not contravened. The pre-estimation tests conducted in this case are the Normality test, Multi collinearity, Test for Fixed or Random Effects, Wooldridge Test for Serial Correlation and Heteroscedasticity Test. The study performed these tests to avoid spurious regression results.

4.3.1 Test for Multi collinearity

Multi collinearity was assessed in this study using the variance inflation factors (VIF). According to Field (2009) VIF values in excess of 10 is an indication of the presence of Multi collinearity. The results are indicated in Table 4.2.

Table 4.2: Multi collinearity

Variable	VIF	1/VIF
Liquidity Risk	2.960	0.338
Operational Risk	2.780	0.360
Market Risk	2.780	0.360
Credit Risk	2.300	0.434
Mean VIF	2.700	

As shown in Table 4.2, the results of Liquidity Risk (2.960), Operational Risk (2.780) Market Risk (2.780), Credit Risk (2.300), indicated that there was no multi collinearity since all the values for VIF were less than 10.

4.3.2 Test for Autocorrelation

The study employed the Wooldridge test for autocorrelation to detect the existence of autocorrelation in the data, that is, whether or not the residual are serially correlated over time. The null hypothesis of this test was that there is a first order serial/autocorrelation existed in the data.

Table 4.3: Serial Correlation Tests

Wooldridge test for autocorrelation in panel data

H₀: no first-order autocorrelation

F(1, 10) = 0.001

Prob > F = 0.9787

The results in Table 4.3 shows that the P-value of the F-test is 0.9787 indicating that the F-test is not statistically significant at 5% level. Hence, the null hypothesis of no autocorrelation is supported and the study concludes that residuals are not auto correlated.

4.3.3 Normality Test

To test for normality, the study Jaque Bera test method was applied. The Jarque–Bera test is a goodness-of-fit test of whether sample data have the skewness and kurtosis matching a normal distribution. Normality was checked on the residuals of a model, because those assumptions apply to the unexplained variance of a model. The null hypothesis was that the data was normally distributed. The results are as shown in Table 4.4.

Table 4.4: Normality Test

. jb residuals		
Jarque-Bera	normality test: 13.31 Chi(2)	0.130
Jarque-Bera	test for Ho: normality:	

The results in Table 4.4 indicated that the Chi square value was 13.31 and the P-value was 0.130 which was larger than the 0.05. We thus rejected the null hypothesis and conclude that the data was normal.

4.3.4 Heteroscedasticity Test

Heteroscedasticity test was run in order to test whether the error terms are correlated across observation in the time series data. The error terms from a regression model must have a constant variance called Homoscedastic and to ensure whether the residuals meet this criterion of the study used the Modified Wald test for GroupWise heteroscedasticity where the null hypothesis

under this test is that residuals are Homoscedastic. If the p-value is >0.05 , there is constant variance. The results are indicated in Table 4.5.

Table 4.5: Heteroscedasticity Test Results

Modified Wald test for Group wise heteroscedasticity
in fixed effect regression model

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

chi2 (11) = 15.51

Prob>chi2 = 0.1608

Table 4.5 indicates that the p-value was 0.168. The null hypothesis was therefore not rejected at a critical p value of 0.05 since the reported value was 0.1608. Thus, the data did not suffer from statistically significant heteroscedasticity.

4.3.5 Hausman Specifications Test

When performing panel data analysis, one has to determine whether to run a random effects model or a fixed effects model (Baltagi, 2005). In order to make a decision on the most suitable model to use, both random and fixed effects estimate coefficients. The study used the Hausman's specification test (1978) to choose between fixed and random effect models. Table 4.6 shows the results of Hausman test.

Table 4.6: Hausman Test

	(b) fixed	(B) random	(b-B) Difference
Liquidity Risk	-3.4081	-3.5221	0.1140
Credit Risk	-4.0914	-4.2020	0.1106
Market Risk	-2.2661	-2.6809	0.4148
Operational Risk	-2.1680	-1.7752	-0.3928
chi2(4)	2.030		
Prob>chi2	0.7366		

The null hypothesis of the Hausman test is that the random effects model is preferred to the fixed effects model. Hausman test revealed a chi-square of 2.030 with a p-value of 0.736 indicating that at 5 percent level, the chi-square value obtained is statistically insignificant. Thus, the study did not reject the null hypothesis that random effects model is preferred to fixed effect model and random model was adopted.

4.4 Correlation

The study conducted correlation analysis for the various variables that are liquidity risk, credit risk, market risk and operational risk on financial performance of banks in order to examine the nature of the statistical relationships between each pair of variables. Table 4.7 shows the correlation matrix of all the variables included in the study.

Table 4.7: Correlation Analysis

	ROA	Liquidity Risk	Credit Risk	Market Risk	Operational Risk
ROA	1.000				
Liquidity Risk	-0.716 0.000	1.000			
Credit Risk	-0.710 0.000	0.687 0.000	1.000		
Market Risk	-0.696 0.000	0.228 0.000	0.696 0.000	1.000	
Operational Risk	-0.670 0.000	0.352 0.000	0.657 0.000	0.421 0.000	1.000

The results indicated that Liquidity Risk ($r=-0.716$, $p=0.000$) had a negative and significance relationship on financial performance of the listed commercial banks. Credit Risk ($r= -0.710$, 0.000) had a negative and significance relationship on financial performance of the listed commercial banks. Market Risk ($r=-0.696$, 0.000) had a negative and significance relationship on financial performance of the listed commercial banks. Lastly, Operational Risk ($r= -0.670$, 0.000) had a negative and significance relationship on financial performance of the listed commercial banks. This indicates that an increase in liquidity risk, credit risk, market risk and operational risk led to a decrease on financial performance of the listed commercial banks.

4.5 Regression Analysis

The study sought to carry out regression analysis to establish the statistical significance relationship between liquidity risk, credit risk, market risk and operational risk on financial performance of listed commercial banks in Kenya. According to Chatterjee and Hadi (2015), regression analysis is a statistical process of estimating the relationship among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent and one or more independent variables. The results presented in Table 4.8.

Table 4.8: Regression Analysis

ROA	Coef.	Std. Err.	z	P> z
Liquidity Risk	-3.5221	1.3435	-2.6200	0.0090
Credit Risk	-4.2020	1.2378	-3.3900	0.0010
Market Risk	-2.6809	1.3349	-2.0100	0.0450
Operational Risk	-1.7752	1.4010	-1.2700	0.2050
cons	5.1436	0.1910	26.9200	0.0000

chi2(4)= 179.22
 Prob>chi2=0.0000
 Within = 0.6306

The regression equation was as shown below;

$$Y_{it} = 5.1436 - 3.5221X_{1it} - 4.2020X_{2it} - 2.6809X_{3it} - 1.7752X_{4it}$$

X_{1it} = Operational Risk of bank i at time t

X_{2it} = Credit Risk of bank i at time t

X_{3it} = Market Risk of bank i at time t

X_{4it} = Liquidity Risk of bank i at time t

The R squared of 0.6306 implied that the four risk namely liquidity risk, credit risk, market risk, operational risk explained 63.06% on the variations on financial performance for the listed banks with the Nairobi Securities Exchange. The overall model was significant as indicated by the Prob>chi2 of 0.000 with a Wald chi2 (4) of 179.22. In addition, the constant of 5.1436 showed that when liquidity risk, credit risk, market risk, operational risk are held constant, performance will remain at 5.1436 units.

The results indicated that there was a negative and significant relationship between liquidity risk and financial performance of listed commercial banks in Kenya ($\beta = -3.5221$, $p = 0.0090$). Further, the results indicated a negative and significant relationship between credit risk and financial

performance of commercial banks listed in the Kenyan NSE ($\beta=-4.2020$, $p=0.0010$). Market risk had a negative and significant relationship with financial performance of listed commercial banks in Kenya ($\beta= -2.6809$, $p=0.0450$). Lastly, operational risk revealed a negative but insignificant relationship with financial performance of listed commercial banks in Kenya ($\beta= -1.7752$, $p=0.2050$). Further, the negative and significant relationship between the variables liquidity risk, credit risk and market risk on financial performance of banks depicted the desired outcome since they amount to the key risk that banks encounter when conducting their lending operations.

4.6 Discussion of the Findings

The objective of this study was to investigate the effect of financial risk on financial performance of commercial banks in Kenya listed on the Nairobi Securities Exchange. The study variables were Liquidity Risk, Credit Risk, Market Risk and Operational Risk on financial performance of listed commercial banks in Kenya. The pre-estimation tests conducted on Normality test, Multi collinearity, Test for Fixed or Random Effects, Wooldridge Test for Serial Correlation and Heteroscedasticity indicated that the underlying assumptions were fit for regression analysis.

The first objective was to analyze the effect of liquidity risk on the financial performance of commercial banks listed on Nairobi Securities Exchange. The correlation results indicated that Liquidity Risk ($r=-0.716$, $p=0.000$) had a negative and significance relationship on financial performance of the listed commercial banks. Regression results indicated that there was a negative and significant relationship between liquidity risk and financial performance of listed commercial banks in Kenya ($\beta= -3.5221$, $p=0.0090$). This implies that a unitary increase in liquidity risk leads to a significant decrease in financial performance of listed commercial in Kenya by 3.5221 units holding other factors constant.

The null hypothesis was therefore rejected and the alternative hypothesis was adopted that liquidity risk have a significant effect on the performance of commercial banks listed on Nairobi Securities Exchange. This is consistent with Mwangi (2014) whose study to determine the effect of liquidity risk management on the financial performance of commercial banks in Kenya found that liquidity risk management had a significant negative relationship with commercial bank performance. The results are also in line with Maaka (2013) study on the liquidity faced by commercial banks in Kenya and relationship between liquidity risk and the performance of banks in Kenya found that profitability was negatively affected due to increase in liquidity gap and leverage. The level of customer deposit was found to positively affect banks profitability. Further the findings are in line with Konadu (2019) study that determined the liquidity trends of selected banks so as to ascertain the profitability trend of the selected banks with the aim of analyzing and establishing the relationship between bank liquidity and profitability levels in Ghana and established that there was no positive relationship between liquidity trend and profitability whereas a negative relationship existed between liquidity and bank profit in Ghana.

The second objective was to examine the effect of credit risk on the financial performance of commercial banks listed on Nairobi Securities Exchange. Correlation results indicated that credit Risk ($r = -0.710, 0.000$) had a negative and significance relationship on financial performance of the listed commercial banks. Regression results further indicated a negative and significant relationship between credit risk and financial performance of commercial banks listed in the Kenyan NSE ($\beta = -4.2020, p = 0.0010$). This implies that a unitary increase in credit risk leads to a significant decrease in financial performance of listed commercial in Kenya by 4.2020 units holding other factors constant.

The null hypothesis was therefore rejected and the alternative hypothesis was adopted that credit risk have a significant effect on the performance of commercial banks listed on Nairobi Securities Exchange. The findings agree with Kithinji (2010) whose study to determine the relationship between credit risk management and profitability of commercial banks in Kenya and established that credit risk had a significant negative effect on financial performance of financial institutions. The findings are in tandem with Li and Zou (2014) study that determined the relationship between credit risk management and profitability of commercial banks in Europe and ascertain whether the relationship is stable or fluctuating. The research findings established that credit risk management did not have a positive effect on commercial bank profitability. As with regards to credit risk management NPLR had a significant relationship on both ROA and ROE while CAR had an insignificant relationship on both ROA and ROE. The researcher further established that there was a fluctuating relationship between profit and credit risk management during the period under investigation. Further, Aduda and Gitonga (2011) study determined the relationship between credit risk management and profitability of commercial banks in Kenya and the research findings obtained from the regression model indicated that there was an effect of credit risk management on profitability at reasonable level with 27.8% possibility of NPLR in predicting variance in ROE.

The third objective of the study was to establish the effect of market risk on the financial performance of commercial banks listed on Nairobi Securities Exchange. Correlation results indicated that Market Risk ($r=-0.696, 0.000$) had a negative and significance relationship on financial performance of the listed commercial banks. Regression results indicated that Market risk had a negative and significant relationship with financial performance of listed commercial banks in Kenya ($\beta= -2.6809, p=0.0450$). This implies that a unitary increase in market risk leads

to a significant decrease in financial performance of listed commercial in Kenya by 2.6809 units holding other factors constant.

The null hypothesis was therefore rejected and the alternative hypothesis was adopted that market risk have a significant effect on the performance of commercial banks listed on Nairobi Securities Exchange. This is in tandem with Wachiaya (2011) who carried a survey to identify the market risk management techniques used by commercial banks in Kenya and their suitability in mitigating financial loss and the significant findings was that limitations made sure management of risk exposure within the bank's risk appetite. Other reasons were restrictions made certain financial institutions took acceptable limitations as authorized by the investors and also there was prudent management of market risk. Further the results are in line with Nimalathan *et al.*, (2012) examined the impact of systematic risk management on profitability of selected financial institutions in Sri Lanka and the results indicated that market risk administration is enhanced by DFL and also DOL in the picked financial establishments where the helpful effects are observed on success. The findings for of their study was that degree of economic leverage was inversely associated to profitability while running take advantage of is positively relevant to productivity. The study by Ngalawa and Viegi (2013) study showed that bank's exposure to interest rate risk or income gap determines the structure of the balance sheet. The study discovered that in Kenya, industrial financial institutions typically retain a huge direct exposure to interest prices that can be predicted through the earnings gap.

The fourth objective of the study was to assess the effect of operational risk on the financial performance of commercial banks listed on Nairobi Securities Exchange. The correlation analysis indicated that Operational Risk ($r = -0.670, 0.000$) had a negative and significance relationship on financial performance of the listed commercial banks. Regression results

indicated that operational risk revealed a negative but insignificant relationship with financial performance of listed commercial banks in Kenya ($\beta = -1.7752$, $p = 0.2050$). This implies that a unitary increase in operation risk leads to a decrease in financial performance of listed commercial in Kenya by 1.7752 units holding other factors constant although the effect is statistically insignificant.

The null hypothesis was therefore not rejected and thus operational risk has no significant effect on the performance of commercial banks listed on Nairobi Securities Exchange. This agrees with Lyambiko (2015) study that determined the operational risk management practices and financial performance in commercial banks in Tanzania and to identify the sources of operational risk exposures among commercial banks in Tanzania and the operational risk was negatively correlated with the financial performance of commercial banks while credit risk and liquidity risk negatively influenced the financial performance of commercial banks. The findings are also consistent with Sewanyana (2011) study that establish the relationship between operational risk and organizational environment in Stanbic bank and the research findings established that there was a negative but insignificant relationship between operational risk management, organizational environment and organizational performance.

The regression analysis further revealed that operational risk management and organizational environment were key indicators of organizational performance. Francis and Hess (2014) findings on operational risk disclosed that though the expense earnings ratio was the principal metric made use of in this benchmarking exercise, it sought to identify best practice not in terms of decreasing this proportion yet rather in terms of recognizing common proportions and price frameworks amongst effective financial institutions. The study observed that there is an inverse partnership between the expense income proportion and the bank's earnings. Mathuva (2018)

found that the cost-income ratio is adverse and also strongly considerable with productivity steps, indicating that extra effective banks produce higher revenues. Tripe (2018), shows how an operational working capital charge could be linked to volatility in the cost-to-income ratio, making use of several of the standard deviation of the proportion.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the study findings, its conclusions and recommendations, presented in consideration to the study objectives used to investigate the effect of financial risk on financial performance of commercial banks in Kenya listed on the NSE

5.2 Summary of Findings

5.2.1 Liquidity Risk and Financial Performance of Commercial Banks

In summary, liquidity risk was found to be negatively and significantly related to financial performance of commercial banks in Kenya. The null hypothesis was therefore rejected that liquidity risk has no significant effect on the financial performance of commercial banks in Kenya. The descriptive statistics indicated that most of the banks had adequate liquidity to cover loans in the event of an economic downturn resulting in loan defaults. Thus the total loans to total deposit were well maintained for most the listed banks at the NSE.

5.2.2 Credit Risk and Financial Performance of Commercial Banks

Credit risk was found to be negatively and significantly related to financial performance of commercial banks in Kenya. The null hypothesis was therefore rejected that credit risk has no significant effect on the financial performance of commercial banks in Kenya. The descriptive statistics on credit risk indicated that majority of the banks had managed to control the credit risk at 20% given the hard economic times when loan impairment is likely. In addition, the study found that majority of the banks had managed to control the credit risk given the hard economic

times when loan impairment is likely to occur. The higher the loan to asset ratio indicated that the loans are unlikely to be repaid and that the full contractual principal and interest would unlikely be fully paid.

5.2.3 Market Risk and Financial Performance of Commercial Banks

Market risk was found to be negatively and significantly related to financial performance of commercial banks in Kenya. The null hypothesis was therefore rejected that market risk has no significant effect on the financial performance of commercial banks in Kenya. The descriptive statistics indicated that the banks had maintained the risk sensitive assets to liabilities at a higher ratio to mitigate the market risk.

5.2.4 Operational Risk and Financial Performance of Commercial Banks

Operational risk was found to be negatively but insignificantly related to financial performance of commercial banks in Kenya. The null hypothesis was therefore not rejected. Thus the study found that market risk has no significant effect on the financial performance of commercial banks in Kenya. The descriptive statistics indicated that the capital charge to gross income was favorable for most banks for their operations.

5.3 Conclusion

Based on the study findings the study concluded that there is a strong correlation between liquidity risk, credit risk, market risk and operational risk on financial performance of commercial banks listed with the Nairobi Securities Exchange.

The study concluded that relationship between liquidity risk and financial performance of commercial banks was strong and statistically significant. In addition, the study found that most of the banks had adequate liquidity to cover loans in the event of an economic downturn

resulting in loan defaults. The study concluded that relationship between credit risk and financial performance of commercial banks was strong and statistically significant. Further, the study concluded that relationship between market risk and financial performance of commercial banks was strong and statistically significant. In addition, majority of the commercial banks had maintained the risk sensitive assets to liabilities at a higher ratio to mitigate the market risk. The market risk face the banks due to the unpredictability of equity markets, commodity prices, interest rates, and credit spreads. Banks are more exposed if they are heavily involved in investing in capital markets or sales and trading. Lastly, the study concluded that operational risk had an effect on the financial performance of the commercial banks although the effect was not statistically significant. The study found that the capital charge to gross income was favorable for most banks for their operations. These operational risk includes the uncertainties and hazards commercial banks faces when they attempt to do their day-to-day business activities.

5.4 Recommendation

The following recommendations were made based on the findings of the study.

5.4.1 Liquidity Risk and Financial Performance of Commercial Banks

The study recommended that the managers of the banks should divest the excess cash in productive and capital generating assets. This makes sure that they are not holding excess cash at the expense of the fixed assets that can be used to increase profits. Therefore, the managers should often reevaluate their capacity to raise funds and also monitor factors closely so as to ensure that sound liquidity. Banks managers must possess a regulatory structure to permit them make assessments of banks' liquidity risk administration as well as competence of their liquidity, in both normal times as well as time periods of stress and anxiety

5.4.2 Credit Risk and Financial Performance of Commercial Banks

The study recommended that the managers of the bank to adopt the policies that will ensure debtors ratios does not increase at high ratios in relation to the total capital since this amounts to credit risk. The managers should minimize the credit risk by ensuring the credit worthiness of the clients is critically evaluated with collateral. Therefore, the managers should be vigilant when making the credit policies so that they do not end up negatively impacting the performance of the banks. The study recommends on the lending policies should outline the allocation and scope of credit facilities by establishing the limits which could be based on group authority that allow committees to approve large loans. Also the frequency of committee meetings and reporting procedures should be specified, Managers require understanding how credit policy affects the banks performance to be able to ensure proper utilization of banks deposits as improper management of credit risk will increase the non-performing loans this may result in to financial distress.

5.4.3 Market Risk and Financial Performance of Commercial Banks

Market risk for commercial banks in Kenya had a negative relationship with performance. This signals to bank managers that a decrease in market risk implies increase in performance this can be achieved by organization monitoring all open positions arising from bank activities. Banks should establish financial risk early warning mechanism so that managers can take effective real time comprehensive management to reflect banks financial position including financial structure, profitability and asset utilization to enhance efficiency. This will stop risk events just before they mature.

5.5 Policy Recommendations

On policy recommendations, the study recommends that bank managers should often reevaluate their capacity to raise funds and also monitor factors closely so as to ensure that sound liquidity. The managers should minimize the credit risk by ensuring the credit worthiness of the clients is critically evaluated with collateral and also risk appraisal committees formed to evaluate risk before any loan disbursements.

5.6 Suggestions for Further Research

Further research can be done to determine the causes of financial risk on financial performance; this can be dealt with by taking bank specific factors, market structure factors, supervisory factors, and macro-economic factors so as to give an in-depth insight on influence of financial risk on financial performance. A detailed study can also be undertaken on influence of operational risk on financial performance of commercial banks in Kenya as this type of risk has been recognized by Basel II.

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APPENDICES

Appendix I: Secondary Data Collection Template

Year	Bank	Operational Risk	Credit Risk	Market Risk	Liquidity Risk	ROA
2019	A					
2018	A					
2017	A					
2016	A					
2015	A					
2014	A					
2013	A					
2012	A					
2011	A					
2010	A					
2019	B					
2018	B					
2017	B					
2016	B					
2015	B					
2014	B					
2013	B					
2012	B					
2011	B					
2010	B					

Appendix II: Outputs

```
. summ ROA LiquidityRisk CreditRisk MarketRisk OperationalRisk
```

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	110	2.689636	.8026675	1	3.94
LiquidityRisk	110	.2055545	.0609472	.101	.3
CreditRisk	110	.2004364	.0583602	.1	.3
MarketRisk	110	.1994182	.0594551	.1	.299
OperationalRisk	110	.1989455	.0566633	.102	.3

```
. vif
```

Variable	VIF	1/VIF
LiquidityRisk	2.96	0.338110
OperationalRisk	2.78	0.359721
MarketRisk	2.78	0.359878
CreditRisk	2.30	0.434423
Mean VIF	2.70	

```
.
```

```
. xtserial ROA LiquidityRisk CreditRisk MarketRisk OperationalRisk
```

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 10) = 0.001

Prob > F = 0.9787

```
.
```


	ROA	Liquid~k	Credit~k	Market~k	Operat~k
ROA	1.0000				
LiquidityR~k	-0.7160 0.0000	1.0000			
CreditRisk	-0.7096 0.0000	0.6865 0.0000	1.0000		
MarketRisk	-0.6963 0.0000	0.7280 0.0000	0.6959 0.0000	1.0000	
Operationa~k	-0.6703 0.0000	0.7522 0.0000	0.6566 0.0000	0.7214 0.0000	1.0000

Appendix III: Plagiarism Report

DISSERTATION

ORIGINALITY REPORT

20%

SIMILARITY INDEX

18%

INTERNET SOURCES

2%

PUBLICATIONS

12%

STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

10%

★ Submitted to Kenyatta University

Student Paper

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off