RELATIONSHIP BETWEEN FINANCIAL RISKS MANAGEMENT AND OPERATING EFFICIENCY OF COMMERCIAL BANKS IN KENYA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF AWARD OF DEGREE IN MASTER OF SCIENCE IN COMMERCE (FINANCE AND INVESTMENT) IN THE SCHOOL OF BUSINESS AND PUBLIC MANAGEMENT AT KCA UNIVERSITY.

KCA UNIVERSITY

NOVEMBER 2021

DECLARATION

I, the undersigned declare that this dissertation is my original work and affirm to the best of my knowledge that is has not been presented for any academic award in any University.

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

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Dr. Michael Njogo

ACKNOWLEDGEMENT

In the task of undertaking this study, I have received indispensable cooperation, guidance and invaluable help from many individuals. I therefore take this opportunity to most sincerely express my gratitude to them all.

Foremost I thank the Almighty God for being my provider and for granting me this Divine Favor, strength, good health, sound mind, patience and Guidance all through my studies.

I would like to thank Dr. Michael Njogo for his time, tireless and holistic guidance, positive criticism, suggestions and encouragement that made this study a success. I will not forget all my Lecturers and fellow students for M.Sc. Finance and Investment 2017/2018 class. God Bless you all.

DEDICATION.

I dedicate this piece of work to my precious wife Pamela; thank you for your patience, support and faithfulness. You were always by my side all through thick and thin moments, you greatly encouraged and motivated me during this study. God Has blessed me indeed.

To my Wife Pamela, our Sons Junior and Elroy and dotting daughter Noelle; I love you dearly. Thank you sacrifices you made for supported and gave me ample time during my studies.

To my Parents Mr. & Mrs. Ikwara; thank you for your fervent prayers, moral support and for great upbringing. God bless you.

And to my friends; all this would not be possible without your great encouragements and support. You were all precious to me and God bless you all.

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LIST OF ABBREVIATIONS

AMFI	Association of Microfinance Institutions
ANOVA	Analysis of Variance
BCBC	Basel Committee on Banking Supervision
CAR	Capital Adequacy Return
CBK	Central Bank of Kenya
CRB	Credit Reference Bureau
CRWAR	Capital to Risk Weighted Assets Ratio
EBIT	Earnings before Interest and Taxes
ERM	Enterprise Risk Management
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IAS	International Accounting Standards
IBR	Interbank Ratio
LCR	Liquidity Coverage Ratio
LR	Loan Ratio
NSFR	Net Stable Funding Ratio
PAR	Portfolio at Risk
ROA	Return on Assets
ROE	Return on Equity
SPSS	Statistics Package for Social Sciences

DEFINATION OF TERMS

Performance indicators Factors by reference to which performance of business engagement are measured effectively to establish periodic achievement of some levels of operational goals. The study shall use accounting ratios as reference to performance indicator for banks (Business Dictionary, 2016).

Regulator The Central Bank of Kenya that is legally mandated to supervise and to provide guidelines for operations of commercial banks in Kenya (Bank Supervision Annual Report, 2013).

Risk Management Process of identifying, analyzing and either accommodating or alleviating of uncertainty in investment decision making. It is made up of determining the existence of risks and handling them in the best way possible (Ismail, 2010).

Return on Equity A financial ratio that refers to how much profit a company earns compared to the total amount of shareholder equity invested or found on the balance sheet (Ongore and Kusa, 2013).

Return on Assets Is a measure of how efficient a company's management being in generating earnings from their economic resources or assets on their balance sheet (Murithi and Waweru, 2017)

Operating Efficiency The ratio of annual total revenue generated by a bank to total annual operational costs (Kortmann, 2014)

ABSTRACT

Financial feasibility and durable sustainability of Kenyan commercial banks are endangered by financial risks. For the past twenty years, financial risk management has added a noticeable part in banks. The association between risks management and operations efficiency in commercial banks is one of the most significant practices used in banks to achieve higher returns. In today's dynamic environment, nothing is constant other than risks. Banks are exposed to a number of risks such as credit risk, liquidity risks, operational risks, credit risks among other risks. An efficient risk management system needs to be observed from time to time. The risks and returns are directly related to each other, an implication that an increase in one will subsequent lead to an increase of the other and vice versa. Operating efficient is the ability to deliver products and services without forfeiting quality and it is essential for a well-functioning economy. Banks operate efficiently by directing depositors' savings towards enterprises with highest expected returns through monitoring them carefully after lending depositors' scarce resources. Kenyan Commercial banking is the largest supplier of credit as well as the largest in terms of asset in the financial services industry. The study endeavored to examine the relationship between financial risk management and operational efficiency by Commercial banks in Kenya. Particularly, the study investigated the effect of banks specific performance indicators. Credit risk, liquidity risk, operation risk and market risk on operating efficiency of commercial banks. The study adopted an explanatory research design using panel data, secondary data was obtained from annual financial statements and reports of 42 commercial banks licensed to operate in Kenya for a period of 5 years that is from 2014-2018. Banks with more than 10% missing data were purged out to remain with 38 commercial banks were then analyzed using STATA. Data was analyzed using panel data regression model to attain the best regression equation. Statistical significance shall be checked by F-Test of the overall Fit and t-tests of individual parameter. The study recommends that managers and regulatory authority to concentrate on mitigating financial risks management so as to improve operating efficiency in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Banking system is among the top financial institutions that affects economic growth of a nation. It is positioned strategically in the financial market as it delights in a monopoly position. Generally, banks are involved in various financial activities, the major ones being money depository and investment in different sectors to earn profit. Nonetheless, the augmenting loan problems of the banks hinder efficiency and economic growth of a country because resources are reserved in unprofitable areas. For this reason, banking system requires efficient and effective operations for a guaranteed economic sustainability. In addition, banks need to apply best practices in their operations due to high competition experienced in the sector. High competition in the banking sector effects inordinate risk-taking behavior, reducing the bank's grant value and the power in the market (Salas & Saurina, 2003; Hellmann et al., 2000). Thus, according to Mosko and Bozdo (2015), it is mandatory for the bank's supervisory body to concentrate on productive supervision and capital prerequisite to establish the conceivable enticements of taking higher risks.

CBK Supervisory report' (2011) indicates that progression in the banking sector is stirred by embracing cost-effective supply networks to augment access of banking services. The adoption of information technology by banks has continuously enhanced efficiency in their operations. CBK is committed to initiating policies that promote financial inclusion, use of agency banking in increasing provision for banking services and creation of Credit Reference Bureaus (CBRs) to enable borrowers access loans based on information on competitive terms. Consequently, the banking sector ratio of deposit account holders to number of staff continue

to improve over the years. This is largely attributed to increase in loanable funds, advances and fees from innovative products introduced by several institutions.

In Kenya, one of the significant activities of commercial banks is the conversion of client's deposits, which are short-term, into loans, which are long-term. This significant role of commercial banks makes them susceptible to financial risks. Kiaritha (2015) asserts that there are principal notions in the modern financial theory epicenter, which are essential for managers in planning risk management approaches. For instance, investors are often seeking higher returns that compel them to take high levels of risk. It is necessary for investors to acquire a premium of risks for the risks they cannot reduce through change. Thus, risk taking is an intrinsic aspect in banking sector and high rewards in terms of profits are present to recompense their risk taking. Categorically, risks can be defined as systematic risk or unsystematic risk. Systematic risk is also referred to as market risk or un-diversifiable risk. This type of risk is integral to the whole market sector. On the other hand, unsystematic risk is also referred to as diversifiable risk. Diversifiable risk is a risk that can be accomplished through proper diversification and they are specific to a firm.

Consequently, Diffu (2011) asserts that the necessity to strengthen some strategies embraced by the financial sector to assess the performance of banks should be reconsidered. This is due to the predicament that affected the world economy and financial stability in 2007 through 2009. It is therefore important for financial community to have a comprehensive scope of the fundamental factors that may affect the performance of banks. These factors can include business models capability in relation to risk enthusiasm and how the capability of this business models are viewed outside and within the banks through governance procedures. Likewise, applicable benchmarking profound examination and stress tests ought to be deliberated to analyze the actual tolerability of banks when they encounter stressed market environments, their capability to absorb sequential shocks on the foundation of their business approaches and

the scale of risk lenience. Precisely, this can be described as financial risk management. According to Gaurav (2015), financial risk management is putting into consideration economic value in a specific firm through applying financial tools to control risk exposure including market risk, credit risk, liquidity risk and operational risk.

The financial system of Kenya is the largest and most established across East Africa. The stability of Kenya's financial system has enhanced tremendously in the recent past years holding other factors constant. Beck et al. (2010) examined the efficiency, outreach and stability of banking system in Kenya utilizing the comprehensive bank level and survey data. The outcome of their analysis pointed out that the liquidity positions and quality of bank assets had enhanced rendering the banking system more tolerable to shocks. Nevertheless, the interest rate spreads had deteriorated somehow because of reduced overhead cost of overseas banks. Besides, the outreach of banking system had remained limited although it had improved in the past few years as a result of mobile payment services in the domestic transmittal market.

Financial risk management includes various factors such as creating suitable risk setting, measuring and identifying the risk exposure of banks. It also involves vindicating risk exposure, risk monitoring and developing controls for guiding banks against financial risks. Financial risk management has a system of four processes (Central Bank of Kenya, 2001). They include identification of activities into various classifications of market risk, credit risk, operational risk, liquidity risk and other risks into particular sub-categories and the examination of risks using survey data and risk models. It also involves reporting risk analysis on a timely basis and lastly, controlling of the risks by the senior management. Due to immense diversity of risks taken by banks, no single risk management policy that is designed to manage risks in banking sector works for all banks. Thus, it is paramount for each bank to tailor their own risk management guidelines that suit their needs and situations. Nonetheless, provided the significant errands of banks in a contemporary market economy, the balance sheet of the banks

aptitude, creditors of the banks dispersion in numerous small deposits, the maturity transformation, and the conversion of short term deposits into medium or long term assets calls for regulations in the banking sector. The banking sector is one of the most regulated sectors. These regulations vary from licensing requirements to deposit insurance. The regulations are not limited to Basel I Accord, Basel II Accord, Basel III Accord and the Central Bank of Kenya regulations administered locally.

The Banking Survey Results (2010) points out that the market risk, which includes commodity risk, currency risk, interest risk and equity risk are the risks that glare most financial institutions. Market risk was recognized as prime risk by all banks at 100 percent. It was then followed by credit risk and operations risks, which were noted by 95 percent and 93 percent of respondents respectively. This may be as a result of huge quantity of banks asset portfolio created by loans and advances to clients. On the other hand, the principal challenges facing banking institutions in the course of creation and enactment of risk management functions were as a result of unsuitable risk management procedures, insufficient capable manpower, inexperience of other institute departments on the part carried out by risk management function and insufficient management information structure (CBK, 2011). Besides, financial risk was also among key risks encountered by banks in Kenya. Unfortunately, according to CBK (2016) the banks in Kenya were yet to embrace model-based strategies in analyzing their operations efficiently. Mwega (2013) postulates that competition is essential in any financial sector that provides financial services. Competition stimulates productive growth by technical advancement of competence enhancement. However, competition exacerbates the ethical menace of financial institutions as it augments production efficacy, financial steadiness besides actual regulation and management of the financial services area.

Historically, Kenya has been calling upon foreign banks to penetrate and enlarge banking operations across the nation. Foreign banks have some advantages over local banks

including better technology, ease technological transfers and superb managerial skills. According to Mwega (2013), foreign banks are effective in their operations because they focus mainly on urban market as most branches are situated in urban centers. This helps them refrain from retail banking, which allows them to specialize in corporate products. On the other hand, massive domestic banks are less discriminative when it comes to business approach as most local banks have their activities spread across the country. These variances in operational designs influence commercial banks operating efficiency in Kenya.

Precisely, Gheorghe and Gabriel (2008) ascertain that financial risk management has grown to become a successful in banking industry because of augmenting instability in financial markets, financial inventions, the greater roles undertaken by financial products in the course of financial intermediation and essential financial losses underwent by firms that lack financial risk management structures. Notably, risk management does not mean to reduce risk but to heighten the risk recompense trade-off. Risk management role is to ensure that financial institutions do not engage in unnecessary businesses that may impose risk upon it. This contends that risk management is still developing in Kenya, as financial institutions lack efficient information on actual risk management approach.

1.1.1 Financial Risk

Financial risks are different type of risks related with financing that may involve money transactions such as loans in danger of default (Drehman & Nikolaou, 2011). They are disadvantageous risks that can lead to financial loss and uncertainty in financial institutions. Financial risks can result to banks not attending to their obligations on time, making them susceptible to closure by CBK. Mwangi (2014) studied liquidity effect on operating efficiency of deposit affecting micro finance firms in Kenya. On the other hand, Aneez (2010) studied financial risk processes on banks in Cape Town, revealing an apparent designation for liquidity and edging organic classifications between measures grounded on resemblances of purposes

that assess them in terms of practicability and accuracy. Nevertheless, this study was contrary to the financial risk study by Mwangi (2010) on operating efficiency of financial institutions in Kenya. Mwangi (2010) deliberated on risk management as an element of financial risk management and its impact on Kenya's Commercial banks. Consequently, Maaka (2013) did a study on the connection between financial performance and risks of commercial banks in Kenya. Approximately secondary data from 33 commercial banks were analyzed between 2008 and 2018 using correlation research design. Multiple regressions were also applied in assessing the effect financial risks possess on the profitability of commercial banks in Kenya. The study revealed that financial risks affects banks profitability negatively due to increased liquidity leverage and gap.

Virtually, empirical evidences in comparison to financial risk exposed unpredictable results. For example, Pakistan examination carried out by Naveed (2011) revealed that statistically ROA has inconsequential association with operating efficiency. Likewise, many more studies have been done to appraise insurance firm's performance. Contrary, Chen and Wong (2010) asserted that liquidity is a critical aspect of financial health in insurance sector portraying a negative relationship. Correspondingly, Hakim and Neaime (2012) specified that capital, liquidity and investment are chief elements of viability in insurance and banking sector. Besides, Flamini, McDonald, and Schumacher (2013) pointed out, in their study of Sub-Saharan nations, substantial and undesirable association between banks liquidity and profitability. The above experiential outcomes are opposing and thus a need and purpose to continue with the study on the relationship between financial performance and risk of commercial banks in Kenya.

1.1.2 Operating Efficiency

According to Odunga (2014), operating efficiency is the aptitude of an organization or an individual to offer services or products without losing quality. Thus, banks need to operate

in an efficient way since operating efficiency in the banking sector is mandatory for a well-functioning economy. Generally, banks function efficiently by investing client's savings in businesses that attracts higher returns and watching them keenly after loaning the scarce resources. In Kenya, the banking industry has grown tremendously in terms of profitability and size over the years. Nevertheless, despite this enormous growth in the banking sector, operational risk, market risk and credit risk still poses inordinate challenges. The activities that results in the production and delivery of good and services in a business organization are termed as operations. However, in commercial banks, operations are associated with the delivery of products and services through amalgamation of psychological value, time, form and location (https://www.mheducation.co.uk). Precisely, operation is a process through which goals are accomplished by utilizing resources (https://www.studocu.com). As postulated by Olarewaju (2015), operating efficiency is the degree of how proficiently a product is produced, stored and distributed from a firm.

Efficiency in business operation is significant. Operations efficiency cannot be underestimated in financial institutions especially banks that carry out fiduciary role financial intermediation (Kortmann, 2014). Efficiency is an essential element of organizational performance because all resources and inputs such as money, time and raw materials are scarce and limited. Thus, it creates sense economically to operate efficiently in an attempt to save resources and still maintaining the level of output that is adequate. Equally, efficiency is associated with minimizing the amount of wasted inputs that attracts greater anticipated outcomes or value when programming is convoluted (Bos & Millone, 2015). Operating efficiency can simply be explained as the ratio between input of an operation and gained output of the operation in a business. According to Browne (2014), the main agenda of operations efficiency is to reduce redundancy and waste so that the diminished internal input will give room for higher profit margins. Operations efficiency is significant in banking also because it

allows banks to identify inefficiency sources and assist them to increase survival chances in highly competitive markets where they are situated (Kliestik & Streimikiene, 2017). Nevertheless, various factors are responsible for impelling operation efficiency of corporate firms like banks.

Glass and Wilson (2014) demarcated operations efficiency as a tactical approach applied by a corporate entity to maintain a sensible balance between expenses and output. Besides, they suggested that it is a method of recognizing procedures that are uneconomical which cause loss of resources and profits in an organization and the minimizing of expenses to maximize profits of resources by giving improved services to customers. Efficiency ratio or utilization of assets typically measures the effective use of assets provided in banks while, on the other hand, operating efficiency measures the effectiveness of production of services and products, and how they are held and distributed by a firm, which remains the most key risk encountered by Nigerian banks (Oluitan, Ashamu & Ogunkenu, 2015).

In the banking sector, operating efficiency can be defined as the output versus the input ratio. In this case, the output refers to loans, advances, and deposits while the input refers to capital, costs and labor. Operating efficiency is significant because with it commercial banks have competitive advantage over others as well as increased profits. According to Olarewaju (2015), the aim of commercial banks is to transform inputs into financial services and products economically in comparison to profits generated since, like other organizations; they want to maximize shareholders money from their operations. Efficiency in the midst of banking operations can be distinguished in terms of banking allocative efficiency that requires a benefit or cost ratio, but technical efficiency involves outputs on frontier curve of production (Odeleye, 2014). Important to note, allocative efficiency determines the necessity the amount of resource allocation with the highest projected value, while technical efficient is determined when a firm produce particular quantity of output using the least likely amount of inputs. Utilization of

resources in an efficient and effective way is significant objective to bankers. It is a long run viability of commercial banks operating business in a highly competitive surrounding, which partly depends on how efficiently and competitively they are being done (Olasupo, Afolami & Shittu, 2014).

The performance of banks becomes a significant objective when financial resources are allocated efficiently. This is because of the intangible and indispensable nature of banks procedure in the financial intermediation development and progression in any nation. According to Kortmann (2014), banks need to be efficient because of the intermediary and pivotal role they play in the economy. Banks channel money from units in surplus to units in deficit for the economic productive venture. Odeleye (2014) recognized that effectiveness designate performance level that defines a procedure that utilizes minimum inputs (resources) to generate maximum outputs (monetary outcome or market value). Effectiveness is associated with utilization of resources (inputs) in creating output which may comprise energy and personal time. Efficiency can be measured because it is a measurable theory. Any cost to income indicator can measure efficiency in banking procedures. Equally, it is a theory that defines output to total input ratio generally aimed to minimize misuse of resources like money, time, energy and physical materials. It also aims to maximize revenue to accomplish the anticipated output which will ultimately cause greater viability for the financial institution (Schaeck & Cihák, 2014).

Consequently, indicators of efficiency are noticeable aspects that appear to regulate/evaluate efficiency level in a firm. Precisely, they are performance pointers estimates with proficiencies haggard from innovative world. They are in contradiction of the LDCs maintaining the level of capital market expansions and money. Martin and Zimková (2015) contended that when banks increase in efficiency and become competitive, it leads to a better institution and individual savings distribution of more dynamic investments enhancing

economic development. In this case, advances and loans or deposits total balance can be considered as outputs, whereas capital, labor and other operating costs are considered inputs. Odeleye (2014), articulates that, in banking, allocative efficiency is the effective and efficient utilization of bank resources, first, as crucial goal of every financier, and secondly, as the prime instrument or defense to help achieve inclusive objective of the bank.

Hussain (2018) argues that the cost to income ratio (CIR) is a critical measure of operation efficiency. CIR fundamentally equates the production cost with benefits of the product and it institutes the operating verge of the financial institution. According to Buchory (2015) the operating cost to operating revenue ratio can equally be applied as a measure of operating efficiency. Besides, operating efficiency can also be measured by comparing ideal throughput with actual throughput. In this case, the actual throughput to ideal throughput ratio is calculated in percentage. Likewise, operating efficiency can also be measured by Relative operating efficiency (ROE) by comparing actual throughput as a ratio of the finest perceived production throughput. ROE is projected by observing the finest perceived industry performance of the similar undertaking, for example, in executing the same procedures and this will be embraced by this study. Relative industry standards are commonly utilized in determining operating efficiency since individuals can identify same process, machine, and bank proficiencies.

The significance of operating efficiency lies in the fact that it shows whether the bank can make viable returns. Banks guard its viability against unforeseen damages, as it advances its impending profitability and reinforces its capital point through the investment of reserved remunerations. Financial institutions that create losses every time will in due course diminish its capital base, which in turn puts equity and debt holders at risk. Numerous indicators are utilized to evaluate operating efficiency of viable banks. Return on Assets (ROA) is one of the indicators used to assess commercial banks. ROA is the annual net income divided by entire

resources typically the average value annually. It tells the capability of a financial institution to make revenue by exploiting available firm resources. Kashyap et al (2011) speculates that ROA specifies management efficiency of a firm to make net income using the entire firm's resources.

On the other hand, to fashion investor value, Return on Equity (ROE) must be superior to its equity cost in a bank. ROE and ROA are the common utilized ratios. ROE quality level ranges from 15 percent to 30 percent, while ROA quality level is approximately 1 percent. Wong et al. (2013) designated that bank's efficiency is effectively measured when using ROE. This is because ROE demonstrates the degree banks utilize reinvested revenue to produce impending proceeds. The linking profit measurement to the equity of shareholders is usually utilized to delineate the bank's efficiency (Risks Bank's Financial Stability Report, 2012). Important to note, ROE a critical valuable profit making efficiency measure because it measures the amount of revenue a bank can receive on the equity capital (Jensen Investment Management, 2011).

Lagat, et al (2013) examined the impact practices of financial risk management have on loaning portfolio amongst credit and saving companies in Kenya. Amambia et al (2013) studied how liquidity risk management impacts Kenya Power performance with prominence on liquidity menace. Lastly, Ogol (2011) carried out a study on the practices of financial risk management and their impact on micro-finance organizations in Kenya. This study pursues to scrutinize the affiliation between financial risk management and Operating efficiency of commercial banks in Kenya.

1.1.3 Commercial banks in Kenya

Commercial banks are financial liaisons that integrate financial services and personnel to meet public financial needs as they generate returns for the proprietors. They target at attaining full productivity in its operations (Buchory, 2015). Commercial banking stands to be

significant sector in any economy as it enables money movement from savers to debtors. The banks get cash from clients and expend it as loans to individuals or businesses (Kinuthia, 2010).

Kenya has a total of 42 commercial banks, where 29 of them are for local owners, and the remaining 14 belong to foreign owners (CBK, 2018). By 2018, foreign banks account for 35% of bank assets. Financial systems in Kenya are governed by commercial banks as financial intermediaries, which act as channels between the remaining economic units and the underlying economic units (Beck et al., 2011). Concurring to the law of the Central Bank, an essential part of it is cultivating economy and dissolvability with an appropriate working steady budgetary framework. This enacted work suggests a steady and effective money related framework that supports intermediation preparation for financial development and advancement (Kamau, 2011). The significant role played by commercial banks in the financial system has led to the attention of critical research into various factors that may undermine the stability and risk of debt disparities (Driga & Dura, 2014). A commercial bank is a corporate entity tasked to increase the shareholders' assets value capitalized in the company at a tolerable risk level (Rose, 2012).

Christensen (2010) classifies Kenya as a market economy on the border of its developed financial markets, but not to the same extent as emerging markets. For example, between 2008-2010, South Africa’s GDP ratio was almost 34% compared to 63% of emerging market economies. However, with time these indicators show improvement. Receiving a residual income is essential to staying permanently and stable. The banks are regulated and accredited by the banking act requirements and the Guidelines and Regulation Procedures dispensed below. There are prominent players in the Bank of Kenya program, and essential when monitoring outside and on-site investments to guarantee that they comply by the rules and principles. The banking business has been identified to be cardinal component in achieving the 2030 vision by raising savings, promoting foreign direct investment (FDI), protecting the

economy against external tremors, and moving Kenya to a prominent financial institution in Southern and Eastern parts of Africa.

In 2018, statistics in Kenya recorded a yearly economic escalation of crime by 48%. Kenyan banks have lost dramatically 2.3billion shillings in three months, from January to April 2019. Commercial banks lost 545 million shillings in the first six months of 2018 through fraud, according to the CBK (2018). According to vision 2030's Term Plan, some of the targets include developing a secure and reliable payment system that will ensure efficient and effective transfers between customers and banks and between the banks themselves. In this regard, internet use, mobile networks use and the use of payment cards, durability, and security need to be monitored to upsurge dependence, honesty, and assurance in computer-based compensation structures. Compared to other East African markets, the Kenyan banking division has been recognized because of its magnitude, liquid asset ratio, asset quality and diversification (Beck et al., 2012). In a nation where the budgetary division is overwhelmed by commercial banks, any disappointment within the division has a gigantic suggestion on the nation's financial development (Oloo, 2011). This is usually the result of any collapse within the division containing an alarming impact that can result in bank rush problems and generally bring budgetary exigency and financial woes. In addition to the overall financial performance of banks in Kenya, there are a few banks announcing losses (Ongore and Kusa, 2013).

1.2 Problem Statement

Banks in developing countries quest for new administration challenges to assist progress efficiency. Most often strive to achieve this by improving financial management and providing new products and services to appeal for additional funding. Managing this operation has always been a second concern, mainly because of its low regard for profit (Said, 2012). This reputation of banking efficiency has recently been tested by a study conducted at Indian Scheduled Commercial Banks. (Siraj & Pillai, 2014). They found out the main sources of efficiency are affected by a global finance problem. This reinforces the need to understand the motives for efficient operations in the proper management of commercial banks. Despite the growth of the banking sector in Kenya, they still face numerous challenges to managing risk that exposes banks. Risks taking are an essential element of banking whose rewards are profits. Likewise, excessive and uncontrolled risk can cause losses and thus jeopardize the security of bank deposits. The type and the risk appetite for a bank majorly depend on its size, complexity of business activities and volume.

According to CBK (2011), the most common risks in financial institutions were strategic, credit, liquidity, interest, foreign exchange, price, operational, reputation and compliance/regulatory risks. Financial institution managers should attach great prominence to cultivating the aptitude to detect, evaluate, observe and manage the whole ranks of perceived risks. Sound risk management systems allow managers to take critical steps in reducing risk where necessary and prepare for an unexpected future with complete confidence. The operating efficiency model based on banks' specific performance indicators is envisioned to offer an approach to financial risk management in the banking sector.

Within the final two decades, deregulation and liberalization seen within the money related segment in Kenya have realized financial institutions encounter a part of stretch within the administration of their boundaries (Hussain, 2014). Several commercial banks are swayed by poor budgetary risk management and substandard budgetary advancements (Guo & Liang, 2014). Thus, notwithstanding the swift innovation rate, viable banks are yet burdened with numerous difficulties in their delivery of service, and a huge populace rests unbanked.

1.3 Objectives of the Study

The research will be guided by general and specific objectives.

1.3.1 General Objective

The stud general objective is to define the affiliation between financial performance and liquidity risk management of commercial Banks in Kenya.

1.3.2 Specific Objectives

i) To evaluate the connection amid operating efficiency and market risk of commercial banks in Kenya.

ii) To appraise the affiliation amid operating efficiency and credit risk of commercial banks in Kenya.

iii) To scrutinize the connection between operating efficiency and liquidity risks of commercial banks in Kenya

1.3.3 Research Hypotheses

i) H_{o1}: Market risk has no momentous effect on operating efficiency of commercial banks in Kenya.

ii) H_{o2}: Credit risk has no substantial impact on operating efficiency of commercial banks in Kenya.

iii) H_{o3}: Liquidity risk has no noteworthy effect on operating efficiency of commercial banks in Kenya.

1.4 Significance of the Study

In the current public policy apprehensive with economic growth of a nation, market competition and operating efficiency in the sector of finance and banking are considered significant areas. Thus, practical examination of operating efficiency factors for commercial banks in Kenya and their market share directory location is a vibrant prerequisite for the change of policy. This research is imperative in the following facet;

1.4.1 Commercial banks management

Enhancement of banks' performance and operating efficiency is an essential necessity in offering more competent structure of resource sharing therefore giving reassuring financial frame for economic expansion. This may decrease intermediation cost that openly influences the intermediation boundary in the market.

1.4.2 Policy makers and the financial regulators

This research evaluates a modern policy concerns comparatively with operation of banks. The study examines how the performance of banks, which is measured by liquidity risk management, credit risk management and capital adequacy, can clarify in a clear manner the alterations in bank's operating efficiency. This kind of exploration is significant in demonstrating confirmation for policy modifications comparatively to competition in the market.

1.4.3 Academic Development for further research

Thirdly; the research develops on presented literature concerning research in banking sectors of developing nations and mostly Kenya. The research backs the literature that pursues to expound operating efficiency on commercial banks. The part assumed by the structure of market and institutional aspects are possibly substantial for Kenya to comprehend as it

embraces most important reforms in the banking sector. This is backed by the point that the evolving nations are recognized for extremely ineffective banking segment, causing damages to financial improvement and equilibrium. Therefore, examination of diverse areas attains a competent banking structure. Likewise, the study offers fresh comprehension to legislators, consultants and commercial bank managers on the significance of various facets that improves operation efficiency of banks, banking system performance and provision of quality services. Furthermore, the study allows banks to have a model-founded methodology in solving risks they encounter.

1.5 Scope of the Study

The study will include forty two commercial Banks that are regulated and licensed by the Kenyan Central Bank. It will utilize bank exact financial risk elements to examine the association between operating efficiency and financial risk management of commercial banks in Kenya. Markedly, outside aspects that influence banks operating efficiency are not limited to universal financial catastrophe, inflation, and political instability and exchange rate fluctuations. Nevertheless, the influence of such variables on performance of banks is constant to all banks, making the variables not viable statistically for scrutiny specially when the instrument of investigation are commercial banks functioning in Kenya for the period of five years as from 2014 to 2018.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Theories and interpretations of the reviewed literature that are relevant to the subject of the study will be provided during the course of this chapter. The following is a table of contents: Specifically, it will give the reader with an understanding of the theoretical underpinnings of the research problem currently under consideration. To be more specific, this chapter discusses the empirical review, the theoretical framework, the conceptual framework, and the research gap, among other topics.

2.1 Theoretical Framework

A comprehension of theories and models for concepts related to the research issue, as well as the broader field, in which the study is conducted, can be demonstrated by using a theoretical framework, and the researcher can demonstrate this understanding to colleagues (Kiaritha, 2014). For the most part, theories serve as a generalized explanation for the occurrence of research-related difficulties as a whole; as a result, the researcher should be familiar with the theories that are pertinent to his or her particular field of study (Kombo & Tromp, 2009).

2.1.1 Conventional Economic Efficiency Theory.

It was decided to adopt the standard Economic Efficient Theory as a starting point for analysis in order to lay the framework for the present research on bank efficiency performance in order to lay the groundwork for the current research on bank efficiency performance. According to Aly et al (2010), businesses should strive to maximize output while maintaining the lowest possible cost per unit produced. They believe that this is the most effective strategy to optimize profit margins. Economy of scale can be used to achieve optimal output, and a visible benefit can be repeated by incurring more costs associated with overstressing the existing systems,

which can then be contracted by incurring additional expenses. Summarizing, the scenario with the maximum operating efficiency is attained at a level of output at which all potential economies of scale are fully utilized while also achieving the highest feasible degree of operational efficiency is obtained. According to the vast majority of businesses, this is accurate. On a long-term basis, increasing the capacity of existing systems has the potential to raise the level of productive efficiency that is appropriate for a particular situation. The authors (2010) (Zerbe and colleagues, 2010)

According to basic Economic Efficiency Theory, banks may be able to generate cost savings through cost reductions in the aggregate as a consequence of a decrease in per unit cost as a result of an increase in the size or scale of the bank's activities (Gjirja, 2003). This has occurred as a result of the ongoing growth of major financial institutions, which has resulted in their expansion through horizontal acquisitions and the improvement of their operational efficiency (Yudistira, 2014).

Suka (2010) established that the cost of operation has a negative relationship with the efficiency of a system. Banks that participate in a large degree of leading, as indicated by Sabana (2014), have a stronger ability to manage productive operations, which will ultimately result in a reduction in production costs, which is corroborated by other research. Because of this, banks are able to operate more efficiently as a result of the reforms. According to the findings of Chen's study (2009); increasing bank income from sources such as fees and commissions could suggest increased operating costs for banks, which would result in the banks paying higher operational costs in order to provide such services. A considerable risk would be carried by the increase in operational costs, and as a result of the increased operating expenses that would be incurred; banks would face decreasing efficiency as a result of the increased operating expenses that they would be incurred.

According to Conventional Economic Efficiency Theory (CEET), business companies are able to achieve their output at the lowest possible cost per unit of production (Said, 2012). When there are no alternate patterns of resource usage in place that are capable of providing a more favorable overall outcome, overall performance and efficiency can only be achieved. This is not always the case, and it is important to recognize this. When a bank grows in size, it is possible to achieve a high level of allocated performance and efficiency while at the same time reducing both operational expenses and available credit. If you want to grow the size of your bank, you should consider merging or buying another bank. This will allow for the creation of significant operational and financial synergies, which will ultimately lead to improved performance and efficiency (Shalibaz et al, 2012). Profitable cost reductions are achieved as a result of economies of scale, which result in the creation of operating synergies. In other words, every reduction in costs would be followed by an increase in the size or scope of a company's operations. An explanation for the belief that more efficient and performing banks would incur lower expenses and, thus, would acquire an increased share of the market is provided by this concept. Furthermore, the fact that weaker asset management efficiency would result in a higher credit risk being absorbed by the company provides credence to this argument by demonstrating that the business would be more likely to default on its debt obligations (Ahmad & Karunditu, 2010). The increasing number of banks that have been founded in recent years will only serve to amplify this trend, as competition among these institutions will result in the best bank emerging as the finest bank that is currently available to customers. Because of the utilization of competitive environments, it is possible to establish a banking system that is more focused and efficient (Demirguc-Kunt et al, 2009).

According to the allocative efficiency criterion, large levels of competition among banks should prevent them from generating a profit by raising their selling prices to an unacceptable level that is in excess of their margin expenditures, thereby preventing them from making a

profit. An instance of "maximum production efficiency" is one in which a business achieves maximum allocation efficiency by producing the ideal combination of goods and services in order to maximize the benefit to all of its customers and employees (Aly et al, 2010). The notion is based on the concept of limited corporate resources that can only be used for a certain length of time before being exhausted. A big quantity of material used once results in an opportunity cost because the business will not be able to employ the same material for another purpose later on, as previously described (Said, 2012). Only in the absence of any other pattern of resource utilization that would result in a better overall outcome in terms of the welfare of all parties concerned can successful resource allocation be accomplished. In order for improvements in one form of use to be accomplished at the expense of losses in other forms of use, we must have reached the point of maximum allocative efficiency. Achieving such an outcome implies that we have reached the point of maximum allocative efficiency. This is referred to as the Pareto optimal allocation of resources in some areas, because it results in the most effective use of the resources that are currently accessible as a result of the allocation (Isik & Kabir, 2012). Aspects of the theory that are particularly advantageous are that it serves as a core foundation for comprehending a wide range of difficulties related to a corporation's present operating costs, and that it gives the following advantages: (Zerbe and colleagues, 2010). In order for banks to operate at an efficient level, the theory of allocative efficiency criteria is crucial to the success of this research. According to this theory, all bank goods must be priced at their optimal levels for banks to run efficiently. This is due to the fact that all bank items must be priced at their optimal levels in order for banks to operate at their most efficient levels. In the wake of this development, fair competition in the market and interest rate spreads will be less likely to exist in the future, as will interest rate spreads themselves.

Creating the largest amount of output from the smallest amount of input is achievable for a firm if it utilizes all of its resources efficiently, resulting in the production of maximum output

from the smallest amount of input (Miller et al, 2011). If the key concepts of this theory are identified and applied appropriately, they can assist managers in the development of methods for increasing the efficiency of certain components of their organizations (Sekaran & Bougie, 2013). Researchers have relied on the concept of conventional economic efficiency to assess the efficacy of financial institutions in a large number of cases to date (Sathye, 2011; Barr, et al, 2010; Saad & El Moussawi, 2009). Using the paradigm offered, it is possible to hypothesis and evaluates differences in relative economic efficiency across enterprises of varied sizes and organizational structures. It is referred to as higher technical efficiency for a corporation when it regularly produces more output from the same quantities of measured inputs as another corporation. Economic efficiency differences between enterprises are most likely caused by differences in technology and/or pricing efficiency among organizations, rather than by differences in labor productivity or other factors. When inputs and outputs are competitively priced, changes in the market price of constant inputs are reflected in changes in the market price of variable inputs, and vice versa (Isik & Kabir, 2012). Economic efficiency shows that, within a given range of pricing, the firm with higher profits outperforms the firm with lower profits in terms of profitability.

2.1.2 Risk Management theory

A bank's ability to survive and extend its commercial activities would be affected either directly or indirectly, according to the theory, if it were to experience market and liquidity difficulties (Hannah, 2015). If there is no effective and efficient liquidity risk management in place, it is reasonable to predict that liquidity risk indicators will have an impact on bank profitability (Ngari, 2011). In accordance with this view, financial risk is the most significant source of value destruction. Among other things, financial risk is described as a change in the net worth of an asset as a result of changes in interest rates, foreign exchange rates, stock market prices, and commodity prices (Wanjohi, 2017).

Bank managers have the ability to manipulate the bank's position, which is why regulators are only concerned with the total risk of the institution and not the specific risk of the portfolio components in which the bank invests because of this potential. A portfolio's risk does not equal its component risks, contrary to Markowitz's theory, which means that it is impossible to quantify overall risk from a single location. When calculating portfolio risk, it is necessary to construct portfolio return, which must be independent of changes in portfolio composition in order for it to be estimated (Bartram, 2015).

Managers must take into account the risk-return trade-off due of regulatory limits as well as the availability of other choices. Because of the high expense of risk monitoring, bank executives must find a middle ground between precision and affordability (Sovan, 2009). Whichever technique the bank chooses, the trade-off will have a significant impact on the bank's financial outcomes. They want to be able to estimate with high accuracy and precision the greatest loss that the bank is expected to sustain as a result of a risk event, which is their ultimate goal in risk measurement (Norazwa et al, 2015). It is possible for regulators to set capital requirements for a firm that are higher than the projected maximum loss if they believe that the firm will experience the greatest loss. Among the approaches taught in risk management courses, scenario analysis and value at risk are the two most frequently encountered (Shen, 2009). If you utilize the scenario analysis approach to perform risk estimates, there is no obligation to make use of a distribution assumption; in addition, the approach is quite subjective, with the assumption that future discoveries will be similar to those obtained earlier (Olusanmi, 2015).

It is possible to utilize the asset return distribution (ARD) to predict the potential losses in an investment portfolio that has been exposed to risk by using a mathematical model (PAR). PAR estimation methods such as Monte-Carlo simulation and analytical PAR methodology are two

of the most essential methods available, and they both give managers with the confidence they need to make future projections with certainty. However, despite the fact that they may have a non-normal distribution with fat tails that portray the inconstancy of return volatility, they have the advantage of being computationally efficient and tractable in their natural environment. This method has the potential to be extremely effective due to its sound economic theory and careful analysis of market structure, among other factors (Norazwa et al, 2015). In order to manage a portfolio that is exposed to risk, analytical methodologies must be based on traditional portfolio theory; the return distribution is defined in terms of variance and covariance, which demonstrate the riskiness of the portfolio over a long period of time (Sekaran, 2011). With the help of the Portfolio at Risk technique, it was found that market risk was present throughout the course of this inquiry (PAR).

We will be able to better comprehend the relationship between financial risks and financial performance as a result of this theory, and we will be able to identify how well the risks are being managed in the future. A better understanding of the financial impact of client risks on the financial performance of Kenyan commercial banks will be gained via the use of this tool.

2.1.3 Financial Distress Theory

In accordance with Ngari (2011), the failure or reduction of dividend distributions, as well as missed debt payments, are the first signs of financial stress to appear. According to the definition, financial hardship is a period of adverse economic conditions that are compounded by inefficient risk management of available cash. Specifically, according to Noor (2017), financial hardship is defined as the first year in which cash flows are less than the long-term debt of current maturities is more than the cash flows in the preceding year. Providing the company's cash flows surpass its existing debt obligations, it will be able to meet its obligations to creditors on schedule in the foreseeable future. The incapacity of a firm to satisfy contractual debt commitments is the most important aspect in determining whether or not the company is

in financial problems, according to financial analysts. Generally speaking, when a financial organization goes into liquidation or bankruptcy, merges with or buys another financial organization, or undergoes other major structural changes, financial distress is the result, according to popular belief. Due to the difficulties in predicting financial crises in the early phases of the economic cycle, there is an overlap between non-failed and failed firms in this grey area, which can be explained as follows: In most cases, according to studies, bankruptcy is filed when a company's financial situation deteriorates to the point that it becomes increasingly difficult for the company to satisfy its short-term financial obligations as they become due. This is the most important reason for declaring bankruptcy (Cooper & Schindler, 2011).

Sales declines and the generation of negative profits, according to its proponent, are indications of financial challenges in the business (Waweru, 2010). Experiencing financial stress is associated with a considerable increase in the likelihood of running out of money. Financial difficulties are categorized as either indirect costs or direct costs in the financial literature, with the former being the more common of the two. Indirect costs are those expenses that are not directly tied to a person's financial difficulties. According to the findings of Ongore (2013)'s research, indirect financial distress costs are expenses incurred as a result of the operation of a financial institution that is unable to fulfill its financial obligations. This type of expense is not only hidden in nature, but it also entails lost opportunities as a result of its presence. According to the liquidity and credit risks that a firm is exposed to, it is determined whether or not the company is regarded to be in financial distress.

It is possible to obtain an unbiased perspective on the relationship between financial risk and the financial performance measures that were used in the study through the use of this theory. The theory provides an objective foundation from which to conduct an in-depth empirical analysis of the relationship between financial hardship and default risk in commercial banks

because there is evidence to suggest that the consequences of financial hardship manifest themselves prior to the occurrence of default risk.

2.2 Empirical Review

2.2.1 Market Risk

Market risk befalls when a unit suffers cost from hostile schedules in market values occasioning from modifications in prices of fixed-income tools, merchandises, equity devices, off-balance-sheet agreements, and exchanges (Hannie and Sonja, 2011). Market risk is the loss ascending from hostile alterations in market charges and rates such as prices of product and equity (Maniagi et al, 2017). They are the financial risks rising from conceivable fatalities as a result of alterations in impending market expenses or charges (Margaret & Kevin, 2008). The Basel Committee on Banking Supervision display that delivery of evidence on mutual risk metrics to market partakers is an essential to comprehensive banking system. It lessens information irregularity and aids endorse banks comparability risk profiles (BCBS, 2015). It is substantial as creditors, shareholders actions and other market associates of banks effect risk-taking choices of bank managers (Beverly, 2015).

Three pillars, which serve as the framework's foundation, are established, and these pillars include the following: Regulation capital is supported by three pillars, which are as follows: (1) regulatory capital; (2) regulatory capital; and (3) regulatory capital. Credit, market, and operational risks are measured in Pillar I; credit, market, and operational risks are measured in Pillar II; and credit, market, and operational risks are measured in Pillar III. Disclosure requirements that ensure market participants have a thorough understanding of all banking risks, also known as market discipline, are addressed in Pillar III (Sovan, 2013). The application of a number of statistical approaches has resulted in an improvement in the measurement of market risk. VAR Given the nature of Monte Carlo simulation, it is possible to compute the loss distribution of a random process representing a portfolio after a sufficient

number of simulations have been completed. When doing historical simulations, the extraction of VAR for different probabilities can be conducted in a similar manner as when doing historical simulations (Shalibaz, 2012). There are two assumptions that must be met in order to use the VAR variance covariance technique. For the most part, this is due to two factors: first, the portfolio is linear; as a result, changes in the price of the portfolio are linearly related to changes in the prices of individual assets that make up the portfolio's composition; and second, the portfolio is volatile. To summarize, assets have a joint normal rate of return distribution while liabilities do not, and assets have a joint normal rate of return distribution while liabilities do not are also important to remember. As previously stated, this ensures that both the portfolio return and the portfolio loss are designed to be indicative of the overall market environment (Julijana, 2013).

Priya (2013) used the GARCH technique when doing a study on the sensitivity of stock returns for Thai commercial banks in 2013. She also used the GARCH technique when publishing a paper on the sensitivity of stock returns for Thai commercial banks in 2013. According to the researchers, market risk played an important role when assessing how sensitive bank stock returns were to changes in the general market. They discovered that the relationship was both positive and statistically significant. Small and medium-sized banks are more exposed to changes in the market environment than large banks, according to the Federal Reserve. In a similar vein, medium- and small-sized banks are more exposed to changes in the market environment than major financial institutions are. Tradition holds that profit margins will be higher for banks that have a high degree of market dominance and lower profit margins for banks that have a high degree of market rivalry. The value at risk (MR) indicator was used as a measure of market risk for the purposes of this thesis, which is based on secondary data and hence has limited validity. In order to calculate the value at risk (VAR) indicator, a measure of market risk will be used in this investigation. Based on the work of Bonfim (2011), the worst

loss that can be sustained during a particular time period with a given degree of confidence is the sum of the standard deviations for all of the standard deviations across the entire time period. To be accurate in estimating market risk, the standard internal modes for producing VAR must meet a number of conditions, which include, among other things, the levels of daily market and currency risk that are observed (BCBS, 2016). It is necessary to set a number of parameters in order to calculate the VAR value, and these are as follows: Furthermore, in addition to risk variables, the length of time a portfolio holding has been in each position contributes to determining its time horizon (t). It is advised that a short time horizon be used for the computation of the VAR; however, a longer time horizon should be used for the assessment of bank capital adequacy in relation to market risk exposure (see Figure 1). This includes, among other things, the use of historical observations that are at least one year old, as well as the evaluation of correlations across main categories of risk, among other things.

2.2.2 Credit Risks

However, in spite of the widely anticipated role of banks in the effective allocation of resources within an economy, their continual failures as a result of excessive non-performing loans imperil not only their own survival but also the efficiency and productivity of the country. They are also limiting the opportunities for enterprises and industries that have a substantial potential for growth and that contribute to the long-term strength of the economy to flourish. Due to the financial crisis, the need of properly assessing bank risks has been highlighted in a context where bank efficiency has increased and bank capital has decreased.

Banks must prioritize credit risk management above all else if they are to remain functioning and successful. Any changes in credit risk have an impact on the quality of the bank's loan portfolio, and it is critical that these changes are addressed as quickly as feasible. Problems with asset quality will eventually increase the likelihood of a bank going insolvent, according to the Federal Reserve (Cooper et al, 2013). According to the findings of a previous study, the

efficiency with which a bank runs may have an impact on the risk-taking behavior of the institution. Recent research indicates that the quantity of regulatory scrutiny that a corporation is subjected to, and therefore the extent of managerial discretion in risk-taking, varies from one organization to another and is influenced by the quality of management in that organization. The management and control systems in place to secure the institution's operations are more important to bank supervisors than simply focusing on the level of risk that the institution is exposed to. It is possible that an efficient bank with competent management will have greater flexibility in accepting higher risk than a less efficient bank, assuming that all other factors remain constant. In contrast to a more efficient banking system, which is likely to have a higher market valuation than a less efficient business, a less efficient corporation is likely to avoid from taking risks in order to retain the value of the organization's brand name. Aside from that, the agency relationship that exists between management and shareholders has an impact on the relationship that exists between credit risk and operating efficiency. According to Gorton and Rosen (2016), there is a negative relationship between efficiency and financial risk; on the other hand, Saunders et al (2016) assert that there is a positive relationship between efficiency and financial risk (2015)

In a similar line, the level of financial risk exposure that an organization is exposed to may have an impact on the efficiency with which its operations are carried out. Sometimes the costs associated with risk management can be prohibitively expensive, to the point where a higher-risk bank may require much more money and employees to achieve the same level of production as a lower-risk bank. The fact that managing a high-risk corporation is expensive suggests that banks will have a negative impact on the operating efficiency of the organization. It is important to distinguish between active risk-taking, which is supposed to be rewarded by a larger expected return, and passive risk-taking, which is defined by the absence of internal risk control and, as a result, poses a greater threat to the organization. The cost of identifying

and weeding out high-risk credit facilities during the loan advancement process, or the cost of matching interest-sensitive assets and liabilities at each reprising interval, may not be prohibitively expensive, but the cost of risk reduction may be prohibitively expensive if risk is taken into account on an individual basis. Therefore, it is feasible that in the future, owning and operating a low-risk company may be more expensive than owning and operating a high-risk one. As a result, it is expected to have a positive impact on the efficiency of operations while simultaneously addressing the issue of risk management (Kwan, 2015). Moreover, as Chen points out, when banks operate in risk levels and business areas that are equivalent to those of other banks, their efficiency ratings may suffer a significant drop (2009). As Aruff and Can (2008) point out, a higher loan-to-asset ratio suggests that a bank is more likely than a non-bank to default on its debt commitments than the opposite is true for a non-bank. Having a higher proportion of non-performing loans than they would otherwise have, these banks are less efficient than they would be in the absence of this situation arising. Because of the additional risk that banks are taking on by growing their lending volume, it is projected that increasing bank lending will result in higher profits in the long run. Because of a decline in economic activity, which is often followed by an increase in the likelihood of bankruptcy, the findings of El Moussawi and Obeid (2011)'s study demonstrated a negative relationship between risk and efficiency among Islamic banks. As a result of the growth in non-performing loans, bank earnings are expected to decline, which will have a negative impact on the bottom line of the financial institution in question. As a result of the research undertaken by Flamini et al. (2013), Hannah (2015), and Srairi (2016), it has been discovered that credit risk has a statistically significant positive correlation with both performance and operational efficiency (2010). This research provides more evidence that the output mix of the banks is favorable to increasing efficiency over time. Banks would be more prepared to take risks as a consequence

of an increase in the proportion of non-performing loans, while also becoming more efficient as a result of the increased risk-taking.

According to Gakure and colleagues (2008), credit risk is a type of financial risk that is associated with the likelihood that counterparty would fail to meet their financial commitments. In the first instance, credit risk arises as a result of consumers' failure to pay for goods and services that have been offered to them on credit. Credit risk exposure for an organization develops considerably when it is solely reliant on a small number of large clients who may have previously been granted access to a significant amount of credit. This is known as concentration of risk. As a result, credit risk is crucial in the financial services industry, both for short- and long-term financing, with the importance of credit risk varies from one industry to another in terms of its monetary worth to the business. Credit risk is a term used in the finance industry to describe a company's capacity to raise funds on short notice if the company needs it. In light of the fact that it is tied to the distribution of future occurrences, it has the potential to take on an unlimited number of different values. The determination of whether or not funding liquidity risk is forward-looking, as well as the length of time for which it is assessed over a certain time period, is determined at a specified moment in time, called the decision point (Drehman & Nikolaou, 2009). To increase funding liquidity on the liabilities side of their balance sheets, banks typically borrow illiquid assets and then utilize the cash from those loans to make more loan repayments. Traditionally, this has been the accepted approach for a long time. Despite the fact that bank loans are the most prevalent source of credit risk, additional forms of credit risk include interbank transactions (foreign currency), trade finance (futures swaps and options), bonds, and the extension of an agreement to furnish a guarantee (extension of commitment of guarantee). Institutions should first establish a credit risk environment, which the board of directors is then responsible for periodically monitoring, and then implement a credit risk strategy that has been authorized by the board of directors and is

consistent with sound business practices, according to the Basel 1 committee's recommendations. The institution must also develop methods for regulating, monitoring, and measuring credit risk, which should be consistent with its overall business strategy. - In order to give credit, banks must adhere to fair and well-defined credit granting criteria, which should include defining overall credit limits at the level of individual customers based on their exposure to credit risk, among other things. For the second time, banks must provide a procedure for approving new credit and credit limit extensions that is completely apart from the customer's connection with the financial institution in question (Muhammed, 2012). Credit administration measurement and monitoring should be carried out continuously by banks as a third step in the credit risk management process. They should also put in place an administration system that will allow them to keep track of the complete composition of their credit portfolio. At the end of the day, they should create and implement an internal credit risk rating system that will be utilized in the risk management process. The six Cs of character (character), capacity (ability), context (credibility), collateral (collateral), and conditions (character), context (credibility), collateral (conditions), and conditions (conditions) are credit management principles that can be applied in financial institutions. Character (character), capacity (ability), context (credibility), collateral (conditions), and conditions (conditions) are credit management principles that can be applied in financial institutions. There are a number of credit management concepts that can be applied in financial institutions, including character, capacity, and credibility. Collateral (conditions) and conditions (conditions) are examples of credit management principles that can be applied in financial organizations (Aduda and Gitonga, 2011).

For the most part, when it comes to achieving a specified level of profitability, most banks go above and beyond to reach their objectives. However, as a result of this overextension, the bank is compelled to file for Chapter 11 protection. Reducing credit standards for borrowers, in

conjunction with ineffective portfolio management, are the primary causes of the substantial banking troubles that have occurred recently. As Muhammed (2012) points out, credit risk is a factor that can lead to credit events such as bankruptcy and the inability to meet financial obligations, among other things. According to Oludhe (2011), the inability to recover loans and advances made to customers who were linked with the bank's management was a significant contributing cause to the bank's customers encountering financial issues. A key independent variable analyzed in Anila's (2015) research report on factors influencing the performance of commercial banks in Albania was bank size. The size of each individual bank was one of the independent variables investigated in the report. It is statistically significant that the quantity of capital a bank has when it comes to its performance, and it also has a substantial negative relationship with its performance. As a result of their research, some authors, such as Federic (2014), have achieved findings that are diametrically opposed to those obtained by other earlier studies, while other authors, such as Friederic (2014), have received findings that are similar to those obtained by other earlier studies (2014).

In a study conducted in Sri Lanka, Shalibaz and colleagues (2012) looked at whether credit risk has an impact on the financial performance of Sri Lankan commercial banks, and their findings were published. During a ten-year period from 2005 to 2014, panel data from two state-owned banks and four private domestic banks were used in this study. The information was gathered from two state-owned banks and four private domestic financial institutions. The review of financial statements from the selected organizations that had been made publicly available on the internet served as a means of obtaining secondary information for the study. In this study, one of the independent variables was credit risk, which was determined by the organization's non-performing loan ratio as well as whether or not it had enough capital to pay its financial obligations. A statistically significant and unfavorable relationship between return on equity and the capital adequacy ratio and the non-performing loan ratio was found to exist in the data.

In 2011, Sekaran et al (2011) conducted an investigation of the impact of the West African Economic and Monetary Union on credit risk and bank performance over a nine-year period, utilizing data from twenty different financial institutions. With the help of data from member states of the West African Economic and Monetary Union, the researchers were able to determine the impact on member states of the West African Economic and Monetary Union (WAEMU). It was decided that natural logarithms of the variables would be utilized in order to avoid the problem of large numbers and, as a result, heteroscedasticity in the data set. After the Hausman test was completed, the data was analyzed using the random effects model, which was developed by the researchers.

Data from unsecured loans in Kenya was used by Gakure and colleagues (2012) to discover a negative relationship between credit risk and loan performance. This relationship resulted in a severely restricted bank's ability to meet its business responsibilities on time, as demonstrated by Gakure and colleagues (2012). The researchers discovered that the research had an impact on the profitability of commercial banks in a positive and statistically significant way, according to their findings. The non-performing loans ratio, which evaluates how successfully a bank manages credit risk, has a positive and statistically significant impact on the profitability of commercial banks in Europe, as demonstrated by the Bank of England (Liu & Zou, 2014). Imamul and Arif (2015) claim to have gained invaluable insight into the Indian banking sector through their research into the relationship between financial risk and financial success. Imamul and Arif (2015) claim to have gained invaluable insight into the Indian banking sector through their research on the relationship between financial risk and financial success. Annual reports of the selected commercial banks, as well as yearly reports made accessible on their separate websites, served as the basis for compiling this financial information. In spite of the fact that this was completed in a short period of time, the fact that it was done so fast is

insignificant when compared to the results that are projected to be produced from this research over an extended period of time.

Specifically, the author of Shim (2013) points out that when it comes to managing capital assets, large banks have a greater degree of diversification than smaller banks. Additionally, smaller banks have a greater degree of access to the capital markets than larger banks. According to the prior statement, tiny banks are more susceptible to failure than large banks, which demonstrate this point further. Compared to smaller financial institutions, major financial institutions are more vulnerable to risky lending operations, which can result in significant losses and, ultimately, the failure of the firm, according to Li (2013). There have been a number of studies that have discovered that the size of a company is positively related to its financial performance, and that larger organizations in particular are more vulnerable to risk and that their size has a negative impact on their financial performance; as a result, larger organizations in particular are more likely to have a negative impact on their financial performance (DeNicolo, 2010). The findings of a recent study by Cheung et al. (2017) revealed that larger organizations had lower firm performance indicators such as return on assets (ROA) than smaller enterprises.

During a 40-year period, Sameti, Dalali, Rahim, Karnameh, and Hassan (2011) evaluated the impact of macroeconomic volatility on the lending practices of commercial banks in Iran. As a result of their research, they discovered that macroeconomic volatility had a detrimental impact on the lending practices of commercial banks in Iran. It was discovered through the use of the integration method and the vector error correction model that there is a statistically significant positive relationship between performance and market size in this data set, according to the findings. When other researchers looked at the financial performance of conventional and Islamic banks in Egypt, they discovered that the size of the bank had a

statistically insignificant positive relationship with performance, demonstrating that the size of the bank has no effect on profit margins (Amr and Osama, 2015).

Katuku and Dzingirai (2014) discovered that the size of the market has a statistically significant and negatively associated association with the likelihood of bank failure in Zimbabwe's multiple-currency system, and that as the size of the market increases, the likelihood of failure lowers. According to the findings of the descriptive analysis, the vast majority of bankrupt banks had a tiny market capitalization. This is understandable given the fact that major banks have more assets and is able to diversify their risks more efficiently than smaller financial institutions do. A prior study conducted by other authors used the size of the banking industry's market as a moderating factor, which can be used as a point of comparison. Specific to Islamic banks, the investigation looked into the financial risk that these financial institutions were exposed to, as well as the profitability of these financial institutions. Profitability has been found to be positively related to the natural logarithm of total assets, which represents the size of the banking industry, it has been discovered (Anas and Fauziah, 2014). Olusanmi, Uwuigbe, and Uwuigbe (2013) conducted an investigation into the effects of risk management on bank financial performance in the Nigerian market and discovered that the size of a bank, as measured by the natural logarithm of assets, had no moderating effect on the performance of the bank in their investigation. Several analysts have concluded that there is a statistically significant positive relationship between market risks and return on investment (ROI) (Gul, Faiza, and Khalid, 2011). In addition to measuring a bank's credit exposure, the loan loss provision to total loans (LLPTL) also takes into consideration the risk associated with that exposure (Tan and Floros, 2013).

2.2.3 Liquidity Risk

Among the challenges facing the financial services sector are concerns of liquidity and operational efficiency, which are intimately intertwined. According to the authors, a number

of empirical researches have indicated that the link between a bank's operational efficiency and its liquidity concerns varies depending on the nation in which the bank is located. An analysis of the link between operational efficiency, capital, and risk in the Chinese banking system was conducted by Tan and Floros (2013) using a three-stage least square approach. In their research, they observed that operational efficiency, capital, and risk were all positively related in a positive way. According to their results, four risk indicators must be taken into consideration: the loan loss provision to total loans (LLPTL) ratio, the volatility of return on assets (ROA), the volatility of return on equity (ROE), and the Z-score. They discovered that risk (Z-score) and capitalization are statistically significant negative associations, but risk (LLPTL) and efficiency of Chinese banks are statistically significant positive associations, according to the researchers. Specifically, they show out that larger banks (measured in terms of total assets) have a positive relationship with bank efficiency, but banks with more liquidity have a negative relationship with the statistic. Another topic of contention is the notion that banks with higher liquidity are better capitalized than their counterparts in the financial services industry. As a result, banks are being forced to take up more risky lending activities in order to compete more effectively against one another.

In their study of Islamic forms of finance and associated liquidity risks, Ofosu-Hene and Amon (2015) found that banks' liquidity risks are increased by the nature of their business, as well as exogenous macroeconomic conditions, operational procedures, and funding. Liquidity risk exists when assets and obligations have different maturities. Furthermore, the amount to which assets can be converted into liquid cash on demand without incurring losses, as well as the occurrence of unexpected deposit demands on the liabilities side of the balance sheet, are both possible sources of liquidity risk. A liquidity shortage at a single bank can have systemic consequences, meaning that liquidity is crucial beyond the operations of a single financial institution and the actions of other financial institutions (bank). A bank's liquidity ratio must

be at least 25% of total assets, according to Kenyan legislation, which is the absolute minimum. For the purpose of limiting the danger of liquidity shortages, the following ratios will be taken into account: In order to calculate the Interbank Liquidity Ratio (IBR), divide the amount of money lent to other banks by the amount borrowed from other banks. When it comes to determining liquidity, the IBR is a helpful instrument (Due to other banks). A net placer ratio greater than one hundred percent in the market indicates that the bank is more liquid than it is as a borrower of money, indicating that the bank is a net placer rather than a borrower of funds, as seen in the table below. Net loan to asset ratio (LR) is defined as the difference between net loan to asset ratio and total asset ratio divided by total asset ratio in banking and financial institutions. The liquidity ratio of a financial institution can be calculated by assessing what percentage of a bank's assets is retained as loans.

When it comes to satisfying liquidity needs, a bank's capital adequacy ratio is significant; banks with a greater capital adequacy ratio are less likely to have trouble meeting their liquidity obligations. Larger banks have less liquidity on average than smaller banks, which appears to be attributable to the fact that larger banks are less incentivized to hold liquidity because they rely on government assistance in the event of a liquidity shortfall (Aykut, 2016). According to Bonfim and Kim (2011), banks with higher capital adequacy ratios are less vulnerable to liquidity risk than their competitors. Since capitalization, as measured by the ratio of equity to total assets, has an impact on a bank's capacity to acquire funding from the capital markets, a lot of effort is put into reducing liquidity risk. The capitalization ratio is the proportion of total assets to total equity (Arifa & Nauman, 2012). According to Asad et al., the amount of leverage used by a bank, as well as the parameters used to measure the tangibility of a bank, have an impact on the degree of liquidity risk that a bank faces (2011). Shen and colleagues revealed in 2011 that the amount of money a bank relies on non-deposit funding sources is a significant component in evaluating a bank's liquidity risk, and their findings were published in 2011.

Their theory was that the more money a bank was forced to borrow in the money market, the more liquidity risk it would face as a result of that borrowing. They discovered that their theory was right. Asserted that the quality of a bank's loan portfolio is a factor in assessing the bank's capacity to meet its liquidity responsibilities, and that it is a component in determining the bank's ability to meet its liquidity needs.

In his analysis, Bessis (2010) uses a three-pronged approach to examine the risk associated with liquidity. The first scenario is thought to arise when a bank is unable to raise funds at a reasonable cost due to market conditions such as interest rate levels and transaction volumes, as well as difficulties in meeting counterparty commitments, among other things. Liquid assets, on the other hand, act as a safety net that can be exploited to gain an edge in difficult economic times. As a result, there is a mismatch between short-term assets and short-term liabilities, with short-term assets insufficient to satisfy short-term liabilities' payment requirements, resulting in liquidity risk. Liquidity risk, according to this line of reasoning, is the most terrible event that can arise. A big loss is likely to result in liquidity concerns, which will need to be addressed. Large-scale withdrawals of deposits are expected to cause liquidity risk in the banking business; nonetheless, this will be a small source of liquidity risk in the banking industry. A large number of liabilities or a high amount of long-term loan exposure is examples of conditions that could expose a company to liquidity risk and cause it to fail. Both of these factors have the potential to cause the company to run out of cash (Ahmed & Anees, 2012). Market dynamics involving the transfer of increasingly unpredictable sources of credit, according to Oloo (2011), who performed research on liquidity risk management in microfinance institutions (MFIs) during the course of his research, may worsen liquidity risk in MFIs. In this context, volatile funding refers to monies raised through a variety of methods, such as whole-sale transactions, internet banking, and brokered certificates of deposit. The widespread adoption of a dependable electronic banking system has made it easier for

depositors to transfer cash, making the liquidity management platform's operation more difficult (Oloo, 2011).

Liquidity risk management, as the name implies, is focused with examining a financial organization's balance sheet holdings in order to forecast future cash flows and determine how the firm will fulfill its funding needs. The overall picture in this approach to financial stability includes identifying the financing markets to which banks has access, understanding the structure of those markets, evaluating the banks' current and future use of those markets, and monitoring signals of confidence erosion. When it comes to managing their liquidity circumstances, banks should evaluate a number of criteria, including long-term positions and exposure to major depositors, among other things. (Norazwa, 2015) Norazwa, Norazwa, Norazwa, Tabor(2011) did another study in which he looked at commercial banks' financial risk management policies and procedures in light of a suggested framework for financial risk management. Tabor (2011) conducted his research using a specified framework for financial risk management. According to the findings, the study highlighted four essential components of the liquidity risk management process: identification of risks, comprehension of risks, analysis of risks, and risk appraisal, which are subsequently followed by risk monitoring and reporting. According to the liquidity risk management framework, there was a positive relationship between aspects of liquidity risk management procedures and aspects of liquidity risk management processes and practices.

In order to acquire a better knowledge of the procedures of Chinese construction enterprises in Singapore, Liu (2011) looked at their liquidity risk management practices. Controlling liquidity risks has been discovered to be comparable to managing project risks in recent years, and project risk management approaches can also be used to control liquidity risks. The Basel Committee on Banking and Supervision developed it in 2011 and it lays out the essential

principles for managing and supervising liquidity risk, as well as practical guidelines for putting them into practice.

Liquidity risk is defined in the financial industry as the likelihood that a commercial bank would be unable to meet contractual obligations with immediate effect over a specified time period (Drehman & Nikalaou, 2013). When it comes to commercial banks, the majority of the risk is linked to finance. Because swings in funding sources and liquidity requirements are unpredictable, there's a chance that management won't be able to anticipate and plan for them once they happen (Oloo, 2011). Liquidity management so relies on the ability to keep enough cash on hand while simultaneously spending as much as feasible to maximize revenue production. Liquidity management has become increasingly important in the banking industry as a result of the international sub-prime mortgage crisis of 2007/2008. Due to the presence of assets that may be sold without suffering a loss, a bank's concern about maturities migrating is no longer relevant. Banks with assets that are expected to mature in a short period of time, on the other hand, may find that holding liquid assets is less required to ensure financial stability (Ahmed et al., 2015). Liquidity risk can arise as a result of a decline in the quantity of resources available for investment as a result of recessionary economic conditions.

2.3 Operating efficiency of commercial banks in Kenya.

In the absence of a comprehensive definition of bank production, it is difficult to assess financial institutions' efficiency. The total quantity of loans and deposits, as well as the number of accounts established or the value of assets held, are not accurate indicators of output. Furthermore, the value offered by banks, as measured by labor costs and profit, accounts for both the cost of production and the cost of banking in a single transaction, which is crucial to grasp. Mazher (2013) investigated the impact of organizational structure and practice variations on bank performance. Mazher (2013) looked at the impact of organizational structure and practice on bank performance using three sets of operational ratios. This method was also used

to investigate the ramifications of changes in the banking industry, as well as the implications of variations in banking structure and practice. The return on equity (ROE) formula was used to calculate the return on investment (return on investment). Wide interest rate spreads are a prevalent feature of banks in emerging markets, which he agreed to explore. Government rules, high inflation, enormous losses on non-performing loans, high expenses as a result of operational inefficiencies, and anti-competitive activity on the part of financial institutions are all reasons that could lead to broad spreads in the market.

According to Amer et al (2011), the majority of studies on commercial bank efficiency have focused on explaining a performance measure of efficiency using a vector of factors that capture the fundamental components that drive efficiency. The structural and non-structural approaches are the two main approaches that have been widely discussed in the literature. Non-structural approaches are not based on a theoretical model of banking behavior and do not involve optimization problems such as cost minimization or profit maximization. Structured approaches are those that are based on a theoretical model of banking behavior and involve optimization problems such as cost minimization or profit maximization. Non-structural approaches, rather than focusing on a single measure of financial intermediation efficiency, focus on explaining these measures using a variety of financial intermediation efficiency measures, such as interest rate spreads or net interest margins, rather than a single measure of financial intermediation efficiency. This study will apply nanostructured technology to produce accounting and financial ratios, which will subsequently be used as future indicators of bank success based on the findings.

Long-term financial success, on the other hand, reveals that domestic banks outperform their international counterparts, according to researchers. According to Cadet(2014), multinational banks in developing markets, as well as in low-income countries with advanced economies, are not always more efficient than their domestic counterparts. Chen and Lia (2010) also

discovered that foreign-owned banks in emerging markets, particularly in Latin America, performed poorly, if at all, compared to local banks, with foreign-owned banks' performance being much lower than local banks'. Tufan and colleagues (2012) discovered that domestic banks outperform their international counterparts on a number of factors, including profitability, based on their research. Furthermore, some experts feel that the performance of domestic and international banks varies by region, which is contrary to popular belief. According to the study's findings, domestic banks outperform their multinational counterparts when operating in developed countries rather than developing countries. Furthermore, they say that as multinational banks get a larger share of the market, domestic banks in emerging countries' profitability fall as a result.

Kasimodou (2010) took several aspects into account in his study on the efficacy of UK banks, including the bank's size, according to Kasimodou (2010). He divided banks into two categories in the United Kingdom: large and small, based on the amount of assets they owned. Large banks were more effective than tiny banks, he discovered. Small banks outperformed their larger counterparts in terms of financial success, according to the findings of the study. Further research has found that, in addition to other qualities such as liquidity, a bank's size has an effect on its profitability. The opposite is true in emerging countries, according to a professor with a comparable background. Micco et al. (2011) and Wen (2010) support the preceding premise by suggesting that foreign banks outperform other types of ownership in emerging countries. While Detragiache and colleagues (2013) provided a unique viewpoint on foreign bank performance in developing nations, they did so by focusing on financial sector expansion, financial system development, and new loan origination. According to the data, foreign banks in emerging markets have lower operating efficiency than locally owned banks. They have used this approach in opposition to their local competitors.

Accounting and financial ratios have been used in many studies to measure and evaluate bank performance because they provide a significant amount of information about a bank's financial success when compared to previous periods and to the performance of other banks. Several studies have used accounting and financial ratios to monitor and evaluate financial institution performance (Oral & Yolalan 2011). A financial ratio, according to Ong and colleagues (2011), is an accounting measure that is used to assess financial statements and offer information about a financial institution's financial performance. Financial ratio comparisons aim to reveal how well a bank is performing in terms of achieving its goals and objectives, as well as how well it is performing in terms of accomplishing those goals and objectives. The fact that accounting ratios contain a number of fundamental flaws does not preclude them from being utilized as an analytical tool because, despite their flaws, they are convenient and dependable (Halkos & Salamouris 2004). Ratio analysis is the most extensively utilized methodology in financial decision-making since it is a tried and effective method of calculating financial data. According to Brigham and Ehrhard (2008), a thorough examination of a company's financial statements can aid in determining the company's strengths and weaknesses. This information can be used by administration to aid in performance improvement and by others to predict the outcome of future events, among other things. (Page, 2011) (Ong and colleagues, 2011). In a vast number of empirical researches on bank efficiency undertaken in the United States, panel data analysis was used to obtain information.

According to Baker and Tahir, the study was conducted in order to evaluate the utility of multiple linear regression approaches and artificial neural network techniques with the goal of building a powerful tool for forecasting bank performance based on the level of financial risk taken (2009) Between 2001 and2006, 13 Malaysian banks submitted information that the researchers utilized to conduct their examination. A performance metric known as return on asset (ROA) was constructed using seven independent factors, including liquidity risk, credit

risk, cost to income ratio (COR), size (the size of the bank), and the concentration ratio of a bank (concentration of the bank). Despite its shortcomings, it was revealed that the neural network method outperformed many linear regressions, and that it could be used as a basic tool to investigate the linear relationship between a dependent variable and an independent variable. Improved bank performance can be obtained as a result of a strategy that identifies the most relevant explanatory variables for bank performance and provides a simple and understandable explanation of the influence of the contributing components.

A well-functioning banking sector not only strengthens the financial system's resilience to negative shocks, but it also contributes to its overall stability by lowering the risk of default. A large number of academics have focused their studies on the most effective methodology to use in order to approximate bank efficiency, whether parametric or non-parametric in nature. (Chames et al., 2014; Aiger et al., 2012). It is normal practice to assess a bank's operational efficiency by considering both internal and external elements at the same time. Because bank accounts (balance sheet and/or profit and loss accounts) are readily available and accessible, they are frequently used as a source of information for internal performance metrics in businesses. The size element was expected to have a substantial impact on how banks were judged for efficiency in the future. Large banks, in general, are thought to be more efficient than small banks because of economies of scale and a high level of client confidence, according to popular wisdom. Very large banks, on the other hand, may have a negative impact on the efficiency of their banking operations as a result of bureaucracy and other challenges that may arise. According to Omasete (2014), who conducted a study on the effect of financial risk, management on the operating efficiency of insurance companies in Kenya, a non-linear link between bank size and bank efficiency can be established. This means that financial risk management approaches were explored, and risk identification was shown to be the most important influencing element on insurance businesses' operating efficiency in Kenya. The

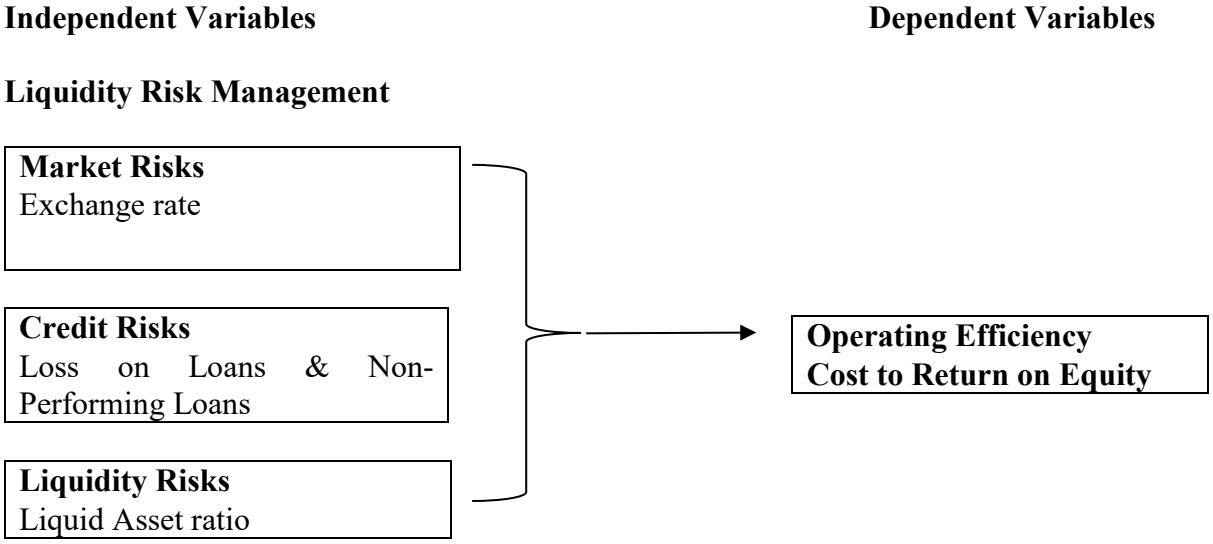
research, according to Aneez (2010), was primarily concerned with, among other things, the definitions of funding liquidity, the structuring of organic groupings, and the evaluation of the correctness and practicability of financial risk assessments. According to Maaka (2013), the emergence of liquidity gaps, as well as the utilization of debt, has a negative impact on the profitability of commercial banks operating in Kenya. Surprisingly, Mwangi (2014) discovered a positive relationship between operating efficiency and financial performance, which contradicts Mwangi's findings (2014). As a result of these flaws, the researcher decided to look into the relationship between financial risk management and operating efficiency in Kenyan commercial banks.

2.4 Conceptual Framework

It is the result of qualitative theorization methodologies being applied to an issue in order to construct a conceptual framework, according to the definition. It represents a network of interconnected concepts that provide a detailed comprehension of the topic under examination as a whole. Ideas support each other in the conceptual framework, articulate their respective phenomena, and join together to form a philosophy that is unique to the framework (Yosef, 2010). This study, which is based on a conceptual framework, is looking into the existing relationship between liquidity risk management approaches and the operating efficiency of commercial banks. The Basel III framework's financial risk management component is a major component of financial risk management, and the study's dependent variable will be financial performance, as measured by return on assets (ROA).

It is used to assess the efficiency of a financial organization's operations by examining its overhead structure. A bank is said to be doing well with its overhead expenses when it uses salaries and benefits, as well as other operating costs, to generate income and profit for its shareholders.

Figure 2.1: Conceptual Framework



Source: Author (2019)

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the research philosophy, research design, empirical model, target population and sampling design, data sources, data collection instruments, data tests, analysis and presentation, and ethical presentation.

3.1 Research Design

This study shall be used to rate specific performance measures of commercial banks in Kenya. Banks' return on assets shall be determined and used as a measure of both the small and large banks. The study shall adopt explanatory approach by using panel research deign to fulfill the researcher's objective. Explanatory research design shall use as the study is aimed at explaining the relationship between the independent variable and the dependent variable to establish the effect of independent variable on the dependent variables.

3.2 Population of the study.

The population of this study shall comprise of all active commercial banks in Kenya both locally and foreign owned, regulated and licensed by Central Bank of Kenya between the periods of five years from 2014 to 2018. During this period there were 42 banks that were licensed by the Central Bank to operate in Kenya. Data shall be collected from financial statements obtained from the central bank of Kenya website as well as the published statements and individual banks' website. Banks are supposed to have published accounts for 5 years that is from 2014 to 2018.

3.3 Data type and sources

Secondary quantitative data shall be collected form internal sources, published financial statements of banks for period of 20014 – 2018, found at the Central Bank in Kenya (CBK).

Other qualitative data about bank history and general sector quantitative performance were obtained from bank supervision reports from the CBK. Financial reports provide a presentation of income statement for the year for banks, Balance sheet as at the year end and notes to the account. From the income statements, data shall be collected on revenue generated for the year and sources, operating expenses incurred during the year, provisions made for impairment losses on loans and advances and net income made for the year. Data from the balance sheet shall include net value of assets, liabilities, capital and reserves. Notes of accounts shall provide detailed data on the analysis and breakdown of balances reflected in the income statement shall be determined using data extracted from the statement.

Financial reporting by banks in Kenya is highly regulated by the CBK. It is also done in compliance with the provision of international Accounting Standards (IAS 30). The objectives of IAS 30 Disclosures in the Financial Statements of Banks and similar Financial Institutions is to prescribe appropriate presentation and disclosure standards for banks and similar, which supplement the requirements of other standards. The intention of this is to provide users with appropriate information, which assists them in evaluation the financial position and performance of banks. Further to that, registered, approved and reputable audit firms do audit the financial statements and reports before they are published for public consumption. This therefore confirms the reliability of data obtained from financial statements and report of banks.

3.4 Data Analysis

The collected data shall be analyzed using Stata software. Data cleaning shall be cleaned as part of data quality approaches of ensuring data is fit for use. Descriptive statistics for data, correlation matrix and estimation of panel data shall be run. Inferential statistics using Hausman test checks shall done in order to determine a more efficient model against a less efficient one. Fixed effect regression analysis shall be performed to evaluate the relationships between the independent variable and operating efficiency. Banks shall be classified into either

low or high market share using simple average of market share index to determine the study from 2014-2018.

3.5 Diagnostic Test

Before data analysis is done the following diagnostic tests shall be undertaken. Assumptions testing are very key tasks while using multiple regressions. Serious violations bring about relationships estimates that are biased, high or low confident estimates of the precision of the coefficients, standard error and unreliable confidence intervals as well as significance tests.

3.5.1 Test for Normality

The error term speaks to every one of the factors influencing the dependent variable but which are not part of the model. It ought to be regularly distributed with a mean of zero and a steady fluctuation showed as μ (0, σ 2) However, it is frequently expected that omitted factors had negligible effect on the dependent variable. On the off chance that OLS is to be utilized, the error term ought to be normal (Gujarati, 2004). To decide this, the specialist utilized the Shapiro-Wilsk test.

Modified Wald test shall be used to determine the statistical properties of the model in order to select the proper functional form of the model, statistical analysis technique shall be used and mean standard deviation, skewness, kurtosis, maximum, and minimum and jarque bera values of the variables overtime will be calculated for secondary data.

3.5.2 Multi-collinearity

The presence of strong relationship amongst the independent variables shall be tested using Variance Inflation Factor among the independent variables. The rule of thumb on variance inflation factor is, if it greater than 0.05 it requires investigation and multi-collinearity is a problem. The study shall use Augmented Dickey-Filler test to test for stationarity.

3.5.3 Heteroscedasticity

Heteroscedasticity occurs when the variance of the error term is not constant. If the residuals have a constant variance, they are said to be homoscedastic that is the variance for each disturbance (error) term is constant and independent of the explanatory variables. The study shall use the white's test to detect heteroscedasticity. It examines whether the error variance is affected by any of the repressors, their squares or cross products.

3.5.4 Autocorrelation

Autocorrelation is defined as the correlation on a time series comparing the past values with future values over a period of time here, Wooldridge test shall be used. To correct serial correlation in the analysis, the Prais-Winston procedure shall be used to detect autocorrelation on the residual on the regression analysis.

3.5.5 Tests for Stationarity

The Levin-Lin-Chu unit root test shall be used to test for stationarity. Non stationarity does hold when in a time series data, the mean, variance is not constant within a certain period and the covariance value between two time periods depends entirely on the lag between the time periods and not within the actual time when the covariance is calculated. Non stationarity in regression analysis lead to spurious correlation that increases the value of R^2 and t-scores of the non-stationary in dependent variables, leading to correct model specification.

3.5.6 Operational Framework

Table 3.1: Operational Framework

Type of Variable	Variable	Indicator	Measure	Measurement Scale
Dependent	Operating efficiency	Total cost		
		Total income	Ratio	Ratio/Interval
Independent	Liquidity Risk	Funding	Amount	Ratio/ Interval
Independent	Credit Risk	Non-Performing Loss/Loss on Loans	Amount	Ratio/ Interval
Independent	Market Risk	Interest rate risk	Amount	Ratio/Interval

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents findings derived from the statistical analysis of the secondary data collected for the present study. This chapter begins with presentation of the descriptive statistics (mean scores, minimum, maximum, standard deviation) depicting the manifestation of the study's key variables. This coverage is then followed by the results of the diagnostic tests and inferential statistical analysis used to evaluate the study's objectives. Multiple linear regression featured as the key inferential statistical test for this study. Finally, a brief discussion around the link between the key findings and evidence established from previous empirical studies is presented.

4.2 Descriptive Analysis

This section presents findings obtained from the descriptive analysis of the study variables. The variables considered included; liquidity risk, credit risk, market risk and operating efficiency. Among the descriptive statistics utilized were mean and standard deviation. Descriptive Statistics is characterized by data analysis in a bid to provide a summary of the data in a way that is easy to understand which might also see the discovery of patterns that are part of the data.

Table 4.1: Descriptive Statistics 1

Year		Liquidity-Risk (Funding)	Credit-Risk (Non-Performing Loan & Loss on Loans)	Market Risk(Interest Expense)	Cost to income ratio
2014	Mean	29,711,972	3,039,021	1,478,279	58.54
	Std. Deviation	45,434,736	5,286,726	2,771,161	22.41
2015	Mean	35,087,313	4,057,394	1,788,725	62.83
	Std. Deviation	55,623,088	6,718,838	3,083,503	18.91
2016	Mean	36,917,725	5,082,708	1,865,438	61.95
	Std. Deviation	59,494,196	8,677,290	3,200,570	15.36
2017	Mean	40,982,557	6,070,413	1,824,253	66.44
	Std. Deviation	69,757,298	9,439,578	3,358,117	25.95
2018	Mean	45,865,744	7,262,975	1,937,445	62.52
	Std. Deviation	76,419,732	10,806,518	3,619,903	22.04
Total	Mean	37,713,062	5,102,502	1,778,828	62.48
	Std. Deviation	61,875,168	8,459,188	3,188,758	21.15

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Liquidity Risk (Funding)	190	1,112,261	382,921,000	37,713,062	61,875,168
Credit Risk (Non-Performing Loan & Loss on Loans)	190	246	42,037,000	5,102,502	8,459,188
Market Risk(Interest Rate Risk)	190	7,718	18,928,190	1,778,828	3,188,758
Cost to income ratio	189	6.07	156.00	62.48	21.15

The descriptive statistics reveal that operating efficiency had mean of 62.48 and a standard deviation of 21.15, minimum of 6.07 and a maximum 156.00. Liquidity risk had a mean of 37,713,062, standard deviation 61,875,168, a minimum of 1,112,261 and a maximum of 382,921,000. Credit risk had a mean of 5,102,502, a standard deviation of 8,459,188, a minimum of 246 and maximum of 42,037,000. Market risk had a mean of 1,778,828, standard deviation of 3,188,758, a minimum of 7,718 and a maximum of 18,928,190.

4.3 Test for fixed or random effects

To decide between fixed or random effects a Hausman test was conducted where the null hypothesis was that the preferred model is random effects, that is if the Prob>chi2 value was greater than 0.05. The alternative the fixed effects if the Prob>chi2 value was less than 0.05. It basically tested whether the unique errors (ui) are correlated with the regressors. Since the Prob>chi2 value (0.6158) was greater than 0.05 a random effect was preferred and conducted. The findings were in agreement with Green (2008) that the null hypothesis for the test is that the random effect model is preferred to fixed effect model and is to be rejected if the p value is less than 5% to imply that fixed model is preferred.

Table 4.2: Hausman Test

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
R_Liquidit~g	-1.656719	-1.217895	-0.438824	3.918
R_CreditRi~p	-0.0477314	-1.128569	1.080838	0.835
0.6158		3.140054	-0.6463177	1.650
chi2(4)	1.8			
Prob>chi2				

The Breusch-Pagan Lagrange multiplier (LM) was conducted to help decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test was that variances across entities were zero. This is, no significant difference across units (i.e. no panel effect) since the Prob>chi2 value (0.0094) was less than 0.05 we rejected the null and concluded that random effect was appropriate. The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. This is an assurance that the regression coefficients were stable hence valid significance tests as put by Cooper and Schindler (2006).

Table 4.3: Test for random effects

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Cost to income ratio
chi2(1) = 6.75
Prob > chi2 = 0.0094

4.4 Diagnostic Tests

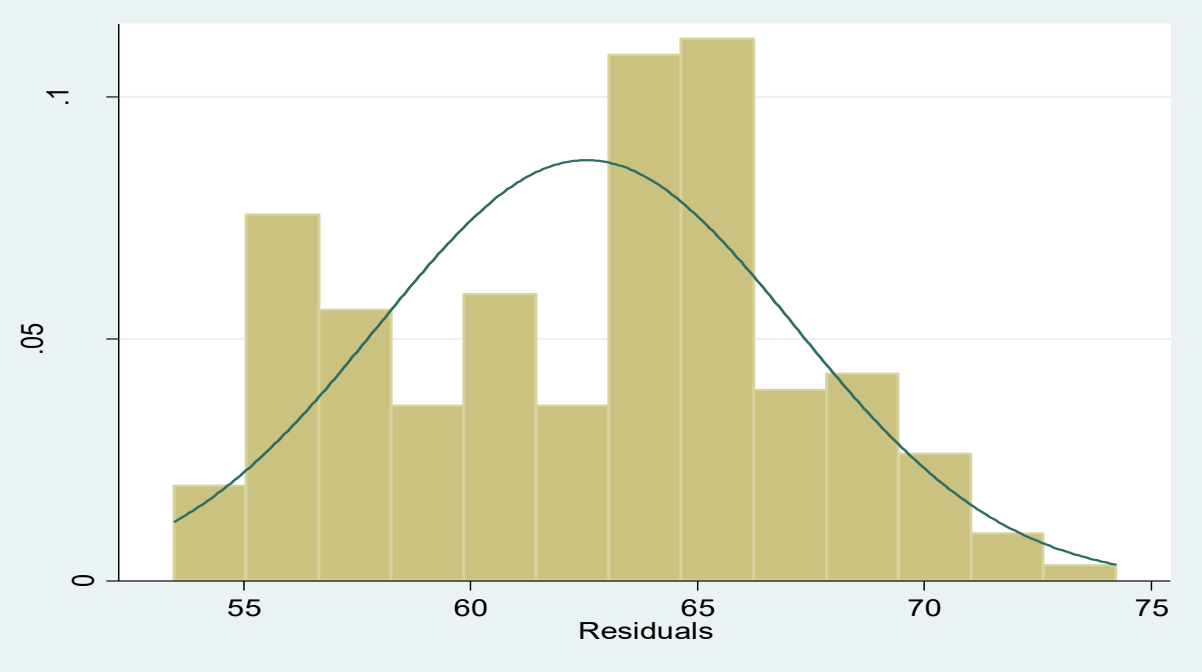
4.4.1Test for normality

One of the assumptions of the classical linear regression model is that the error term must normally be distributed with zero mean and a constant variance denoted as μ (0, σ 2). The error term is used to capture all other factors which affect dependent variable but are not considered in the model. However, it is thought that the omitted factors have a small impact and at best random. For OLS to be applied, the error term must be normal (Gujarati, 2004). Non-normally distributed variables can distort relationships and significance tests. In this study normal distribution of data was tested by use of Shapiro Wilk Test. The Shapiro–Wilk test is a test of normality in frequentist statistics.

The null-hypothesis of this test was that the population is normally distributed. Thus, if the p-value is less than the chosen alpha level, then the null hypothesis is rejected and there is evidence that the data tested are not from a normally distributed population. In other words, the data are not normal. On the contrary, if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected. The findings show that operating efficiency of commercial banks had a (p-

value=0.111), liquidity had (p-value=0.641), credit risk (p-value=0.272) while market risk (p-value=0.043). This is an indication that all the variables had a p value of < 0.05 and hence we reject the null hypothesis and thus there is evidence that the data tested were not from a normally distributed population.

Table 4.4: Test for normality



4.4.2 Test for Multicollinearity

When there is a perfect linear relationship among the predictors, the estimates for a regression model cannot be uniquely computed. The term collinearity implies that two variables are near perfect linear combinations of one another. When more than two variables are involved it is often called multicollinearity, although the two terms are often used interchangeably. If the value of R Squared is high but none of the independent variables are significant or very few independent variables are significant, we can suspect that probably, a model is suffering from multicollinearity. If the value of VIF is more than 10 or tolerance is more than 0.2, we can say that the model is suffering from multicollinearity. Tolerance level formula is calculated as 1

divided by VIF while the t statistic formula is calculated as coefficient divided by standard error. t statistic and p values have opposite values all the time.

Multicollinearity was tested for the data used in the research. This was done using the variance inflation factor (VIF) which quantifies how much the variance is inflated. The findings indicate that the VIF values were closely more than 1 (1.78) indicating that the variance of the variables was inflated at a very low level. The analysis exhibits signs of multicollinearity though low levels. The results indicate that the overall VIF is 1.78 which is less than 10 implying that the study data did not exhibit multicollinearity problem as recommended by (Field, 2009). Thus, all the variables based on the VIF indicators have no severe multicollinearity problem. After removing the problem of multicollinearity from a regression model, some of the variables can become significant. Ways of removing multicollinearity include increasing sample size, transformation of Variables and removing variables though removal of variables should be the last option because that variable may be very important to explain the dependent variable (Field, 2009).

Table 4.5: Test for Multicollinearity

Variable	VIF	1/VIF
R_Liquidit~g	2.11	0.473577
R_CreditRi~p	1.88	0.531568
R_MarketRi~e	1.36	0.734735
Mean VIF	1.78	

4.4.3 Test for Heteroscedasticity

The presence of heteroscedasticity doesn't have an impact on the unbiasedness and linearity of the regression coefficient. Heteroscedasticity (the violation of homoscedasticity) is present when the size of the error term differs across values of an independent variable.

Heteroscedasticity only affects the best property of OLS, which renders the conclusion made when testing hypothesis invalid. The study therefore, carried out Breusch-Pagan test to check the presence of heteroscedasticity (Gujarati, 2004).

The impact of violating the assumption of homoscedasticity is a matter of degree, increasing as heteroscedasticity increases. From the findings, the chi-square value was low, indicating heteroscedasticity was not a problem. Also, it was revealed that the p value of 0.0094 was more than 0.05 significant level implying that the study did not reject the null hypothesis of homoscedasticity and thus there was no heteroscedasticity which means the variance between variables was not homogenous.

Table 4.6: Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Costtoincomeratio
chi2(1) = 6.75
Prob > chi2 = 0.0094

4.4 Correlations Analysis

Correlation analysis was conducted to determine the association between the study variables.

The correlation matrix results show that the study exhibited a weak negative correlation coefficient between Liquidity risk and operating efficiency, as can be seen from the result of -0.042. Another finding was the negative correlation between credit risk and operating efficiency as indicated by the value of -0.154. The study revealed that there was a weak correlation between market risk and operating efficiency as shown by a value of 0.163.

Table 4.7: Correlation matrix

	Costto~o	R_Liqu~g	R_Cred~p	R_Mark~e
Costtoinco~o	**1.000**			
R_Liquidit~g	**-0.042**	**1.000**		
	0.568			
R_CreditRi~p	**-0.154**	**0.677**	**1.000**	
	0.035	**0.000**		
				1.000
R_MarketRi~e	**0.163**	**0.507**	**0.409**	
	0.025	**0.000**	**0.000**	

4.5 Regression Analysis

4.5.1 ANOVA Analysis

From the ANOVA statistics, the study established the regression model had a significance level of 0.0270 which is an indication that there was no significant relationship between the variables. The F critical value was less than the calculated value (0.2766<6.2) an indication that there was a significant relationship between liquidity risk, credit risk, market risk and the dependent variable which was operating efficiency as measured by the cost to income ratio. The p value which was less than 0.05 indicated that the combined relationship between the selected factors on the operating efficiency of commercial banks was not significant.

From the findings, the value of adjusted R squared was 0.123 an indication that there was variation of 0.123 on operating efficiency of commercial banks due to changes in liquidity risk, credit risk and market risk at 95% confidence interval. This shows that only 12.3% of the changes on the operating efficiency of commercial banks could be accounted for by changes in liquidity risk, credit risk and market risk. This shows that 87.7%% of the change in liquidity risk, credit risk and market risk were accounted for by other factors other than liquidity risk, credit risk and market risk.

Table 4.8: ANOVA Analysis

Costtoincomeratio	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
R_LiquidityRiskFunding	-1.2179	2.608696	-0.47	0.641	-6.33085	3.895056
R_CreditRiskNonPerformingLoanamp	-1.12857	1.02768	-1.1	0.272	-3.14279	0.885647
R_MarketRiskInterestExpense	3.140054	1.553563	2.02	0.043	0.095126	6.184982
_cons	56.11694	35.253	1.59	0.111	-12.9777	125.2116
R-squared:	0.123					
Wald chi2(3)	5.01					
Prob > chi2	0.1711					
Wooldridge test for autocorrelation in panel data						
H_0: no first-order autocorrelation						
F(1, 57) = 5.304						
Prob > F =0.0270						

4.5.2 Regression Coefficients

Assuming a linear relationship between the independent and the dependent variable and guided by OLS estimation methods, the relationship between the independent and dependent variables as presented by the regression model was tested. The multiple regression equation was;

$Y = \beta_0 + \beta 1X_1 + \beta 2X_2 + \beta 3X_3 + \varepsilon$

Where Y is operating efficiency of commercial banks, X_1= liquidity risk, X_2= credit risk and X_3= market risk. From the data in the above table the established regression equation was;

$Y = 56.11694 - 1.2179X_1 - 1.12857X_2 + 3.140054X_3$

From the above regression equation, it was revealed that holding liquidity risk, credit risk and market risk to a constant zero, financial sustainability would be at 56.11694. This is economically unsustainable. A unit increase in liquidity risk would lead to a decrease in operating efficiency by -1.2179.

A unit increase in credit risk would lead to decrease in operating efficiency by 1.12857. A unit increase in market risk would lead to an increase in operating efficiency by 3.140054. All the factors were statistically significant as their p values were < 0.05.

Table 4.9: Regression Coefficients

Cost to income ratio	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
R_Liquidity Risk Funding	-1.2179	2.608696	-0.47	0.641	-6.33085	3.895056
R_Credit Risk Non-Performing Loan	-1.12857	1.02768	-1.1	0.272	-3.14279	0.885647
R_Marke Risk Interest Expense	3.140054	1.553563	2.02	0.043	0.095126	6.184982
_cons	56.11694	35.253	1.59	0.111	-12.9777	125.2116
R-squared:	0.123					
Wald chi2(3)	5.01					
Prob > chi2	0.1711					

4.6 Discussion of Findings

This study was guided by three objectives that were addressed quantitatively using descriptive and inferential statistics. The first objective examined relationship between financial risks and operating efficiency in Kenya. Based on the findings derived from the correlation matrix the study exhibited a weak negative correlation coefficient between operating efficiency and liquidity risk, as can be seen from the result of -1.2179. From regression analysis, it emerged that liquidity would predict operating efficiency by 12.1% and a significance value of 0.0641. As such, the results provide evidence to reject the null hypothesis hence liquidity risk has a significant effect on operating efficiency. Additionally, this finding is in line with studies by Kinyanjui (2013) and Oburu (2018) who found that liquidity risk has a significant effect on the performance of commercial banks in Kenya.

The second goal of this study was to evaluate the hypothesis that credit risk does not have a significant influence on the operating efficiency of commercial banks in Kenya. The analysis revealed that credit risk has a significant effect on operating efficiency. With respect to this finding, it was concluded that there was evidence to reject the null hypothesis hence credit risk has an impact the operating efficiency of commercial banks in Kenya. Moreover, this finding

corroborates the findings made by Mwangi (2013) and Njoroge (2014) who found existence of a significant relationship between credit risk and performance of commercial banks in Kenya. As pertains to the third objective, this study embarked on assess the relationship between market risk and operating efficiency of commercial banks in Kenya. Through regression of Internet banking on the cost to income ratio indicator of operating efficiency, it was found that market risk had a significant effect on the operating efficiency. As such, this provide evidence to reject the hypothesis hence market risk has a significant influence on the operating efficiency of commercial banks in Kenya. The finding is consistent with a study by Cheruiyot (2010) who found presence of a significant relationship between market risk and efficiency of commercial banks in Kenya.

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATION

5.1 Introduction

The purpose of this chapter is to present a summary of the key findings and conclusions of the study. In addition, recommendations based on the findings are discussed. Lastly, the chapter highlights the limitations and suggestions for further areas of research.

5.2 Summary of Findings

The main objective of this study was to evaluate relationship between financial risk management and operating efficiency of commercial banks in Kenya. This objective gave rise to three specific objectives: to assess the relationship between market risk and operating efficiency, to evaluate the relationship between credit risk and operating efficiency and to examine the relationship between liquidity risk and operating efficiency of commercial banks in Kenya. Out of these objectives, three hypotheses were stated for statistical testing and the findings were presented based on each objective and corresponding hypothesis.

The first research objective sought to examine the relationship between liquidity risk and operating efficiency of commercial banks in Kenya. This objective led to testing of the third Hypothesis (H_{03}), stated as: liquidity risk has no significant effect on the operating efficiency of commercial banks in Kenya. Multiple linear regression analysis was conducted to assess this hypothesis. The results showed that liquidity risk had statistically insignificant impact on operating efficiency.

The second research objective endeavored to evaluate the relationship between credit risk and operating efficiency of commercial banks in Kenya. The researcher conducted a multiple linear regression analysis to evaluate this objective. The findings showed that credit risk had a

statistically significant effect on operating efficiency. The correlation analysis provided a positive but weak relationship between credit risk and operating efficiency.

The third research objective involved to assess the relationship between market risk and operating efficiency of commercial banks in Kenya. Market risk was proxied by interest expenses. Operating efficiency was measured in terms of cost to income ratio. Multiple linear regression analysis was used to assess the relationship between market risks in conjunction with other variables on operating efficiency. The results indicated that market risk had a statistically significant influence on operating efficiency.

5.3 Conclusion

Based on the findings of this study, it is clear that financial risk have weak positive affect on operating efficiency of commercial banks. The adoption of liquidity, Credit and Market risks management have had varying but close degrees of effects on operating efficiency of commercial banks. Despite of the concluded positive impacts of Liquidity risk, credit risk and market risk on operating efficiency of commercial banks, the relationships were weak. Implying there is need for the banks focus strategic development efforts how to best leverage the financial risk management to support their respective firm objectives in regards to market cost reduction and operating efficiency.

5.4 Recommendations

In order to gain fully from the opportunities presented by financial innovations, commercials banks should design a digital strategy anchored on strong knowledge of their digital maturity, business operating models, flexibility and human capital. Introducing new innovations is likely to bring benefits if the employees of the banks are adapted to a new way of operating, responding to emerging customer behavior or, dealing with a significant increase in customer interactions.

Financial risks are still a key influential factor in the operation of commercial banks in Kenya. In this regard, the banks should undertake measures to enable financial risks mitigation and the capabilities required to foster it. For instance, the banks may enhance their innovativeness by attracting new talent, creating new innovation on financial risks management teams and adopting agile development strategy for products and services. The banks should also consider fostering partnerships with technology start-ups or other third-party relationships in order to maximize the benefits of financial risks management. Alternative service providers, such as FinTech companies, undoubtedly pose a tough challenge to the banks' stronghold, but perhaps they can be formidable allies too. By actively pursuing external partnerships and alliances with these players, banks can obtain the best of both worlds by leveraging on their partners' digital capabilities while bringing their extensive industry knowledge and experience to bear. Beyond technical competencies, banks will also need to pay close attention to the needs of their stakeholders.

5.5 Limitations of the Study

The study only covered a period of 5 years, that is, 2014 - 2018. As a result, the study was based on fewer observations than there would have been if a longer period were to be considered. Due to this, the findings may have failed to offer a more comprehensive picture on the relationship between financial risk management and operating efficiency of commercial banks in Kenya. In the same light, the results are only limited to commercial banks. In other words, the study did not address the potential relationship between financial risk management and operating efficiency of other players in the financial sector such as microfinance institutions, pension funds and insurance companies.

5.6 Suggestions for further research

This research analyzed relationship between financial risk management and operating efficiency of commercial banks in Kenya. However, not all financial risks factors were studied.

It is therefore recommended that future studies be carried out on other factors such interest rate, inflation, financial innovation and other macro-economic factors and may be use of different model as the case may call for. Further study can be undertaken on the relationship between financial risk management and operating efficiency of commercial banks in Kenya.

The current study utilized available secondary data only from the period 2014 to 2018 that are in CBK records and further study is recommended to include longer periods for the panel data using the primary data. This study focused on identifying the key financial risk factors and their relation to operating efficiency of commercial banks in Kenya. The current study recommends that a similar study to be carried for other deposit taking financial institutions such microfinance institutions, investment banks, mortgage firms and SACCOs since the financial institutions face numerous challenges on financial risk management that may result to failure.

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APPENDICES

Appendix I: Letter of Introduction

KCA UNIVERSITY

P.O. Box 56808, 00200

NAIROBI

Date: 1st September 2019

Dear Sir/ Madam,

RE: **REQUEST FOR RESEARCH DATA – RELATIONSHIP BETWEEN FINANCIAL RISK MANAGEMENT AND OPERATING EFFICIENCY OF COMMERCIAL BANKS IN KENYA**

I am currently a post graduate student at KCA University pursuing Master of Commerce (MSC) Finance and Investment. I am conducting a research on relationship between financial risk management and operating efficiency of commercial banks in Kenya

The findings will be significant to the management of financial institutions in Kenya by highlighting the impact financial risk has on commercial banks from an operational perspective.

This is entirely for academic research purposes and confidentiality is emphasized, your name will not appear anywhere in the report. Kindly spare few minutes to provide the required information.

Thank you.

Yours sincerely,

James Omuse Ikwara

Appendix II: Data Collecting Schedule

	Bank	Yrs	Funding	Non-Performing Loan & Loss on Loans	Interest Expense	Cost to income ratio
			(Kshs.000)	(Kshs.000)	(Kshs.000)	%
1	Kenya Commercial Bank Ltd	2014	4,290,338	31,397	11,527	50.2
1		2015	5,568,094	32,489	17,148	52.8
1		2016	5,985,240	36,927	15,779	49.9
1		2017	6,436,668	40,190	15,288	46.8
1		2018	7,149,313	37,642	17,450	45.1
2	Co-operative Bank of Kenya Ltd	2014	2,360,300	12,690	7,718	59
2		2015	2,841,700	13,600	7,926	53
2		2016	2,800,500	12,800	10,897	53
2		2017	3,125,600	12,300	18,026	52.2
2		2018	3,330,000	12,200	27,484	54.6
3	Commercial Bank of Africa	2014	13,778,636	465,731	7,823,998	74.6
3		2015	21,681,898	2,015,424	11,611,342	87.6
3		2016	26,266,677	4,087,483	11,191,900	61.2
3		2017	30,676,011	8,641,242	5,934,805	105
3		2018	30,984,874	20,458,390	6,840,919	97.2
4	Diamond Trust Bank Kenya Ltd	2014	12,000,100	465,690	712,769	42.3
4		2015	20,232,750	895,500	708,900	39.6
4		2016	28,701,900	971,821	889,500	36.1
4		2017	34,152,090	11,256,220	963,400	41.1
4		2018	39,891,010	14,810,540	970,970	43.2
5	Equity Bank Ltd	2014	99,484,065	19,299,400	925,234	48

5		2015	81,487,711	16,799,100	1,005,270	47
5		2016	78,215,905	20,166,010	2,052,650	45
5		2017	86,090,525	12,782,399	2,942,450	41
5		2018	76,895,684	14,910,990	3,279,210	42
6	Family Bank Ltd.	2014	23,391,325	10,567,253	228,125	43
6		2015	18,957,452	16,846,557	219,548	42
6		2016	19,500,185	13,214,782	391,245	43
6		2017	14,982,185	11,977,325	556,125	44
6		2018	19,765,823	10,254,872	637,452	41
7	NIC Bank Ltd	2014	10,989,532	1,096,500	300,660	43
7		2015	17,114,155	1,474,595	327,735	41
7		2016	19,019,952	2,345,821	583,574	38
7		2017	24,813,521	3,598,564	521,784	38
7		2018	27,685,145	3,784,235	698,277	43
8	Sidian Bank	2014	13,218,000	7,450,325	320,980	63
8		2015	22,819,000	8,964,300	405,670	68
8		2016	23,482,000	10,375,456	429,555	85
8		2017	29,017,000	15,839,462	328,691	111
8		2018	38,927,000	14,795,635	462,668	110
9	Citi Bank Ltd	2014	71,534,526	13,964,376	756,760	56
9		2015	98,458,600	16,563,839	771,090	56
9		2016	108,009,580	17,483,291	723,800	54
9		2017	115,698,450	24,562,900	824,140	53
9		2018	146,892,154	31,946,325	824,145	54
10	Cons olidat ed Bank	2014	10,627,850	1,104,740	480,800	45.2

10		2015	14,072,590	1,795,732	423,200	44.1
10		2016	15,829,153	2,595,636	423,267	45.2
10		2017	18,019,544	3,637,946	502,540	44.4
10		2018	20,159,850	4,983,655	928,430	43.6
11	Standard Charted Bank	2014	18,635,000	5,638,098	870,540	59.1
11		2015	26,622,000	8,705,665	970,134	68.3
11		2016	29,020,000	8,221,895	970,160	72.2
11		2017	32,726,000	12,705,665	809,854	71.2
11		2018	36,919,500	14,446,795	973,321	70.1
12	I & M Bank	2014	10,627,000	1,687,954	503,660	47
12		2015	16,620,000	2,178,490	575,450	46
12		2016	18,747,100	2,856,467	625,330	44
12		2017	20,405,000	3,687,456	748,890	46
12		2018	23,308,200	5,409,767	728,540	45
13	African Banking Corporation	2014	16,328,000	7,498,362	323,020	46
13		2015	19,396,000	9,375,583	261,210	44
13		2016	23,581,000	11,598,574	321,970	45
13		2017	26,719,000	11,847,745	489,690	45
13		2018	31,069,205	12,549,820	670,420	44
14	Barclays Bank of Kenya	2014	188,425,000	16,649,320	584,908	52
14		2015	263,938,000	27,553,052	633,000	53
14		2016	298,181,000	35,622,000	726,330	53
14		2017	365,267,000	39,709,300	932,000	55
14		2018	382,921,000	42,037,000	752,868	45

15	Eco bank	2014	36,804,000	14,976,600	180,546	63
15		2015	55,526,000	17,694,700	238,760	64
15		2016	57,578,000	22,905,700	235,430	63
15		2017	64,261,000	27,996,000	354,538	62
15		2018	94,277,000	32,875,900	584,650	62
16	Bank of Africa Ltd	2014	62,211,641	561,825	3,157,464	101
16		2015	69,280,267	2,777,945	3,764,295	73.4
16		2016	55,995,671	1,216,268	3,492,703	74.7
16		2017	54,191,291	6,756	2,870,214	82.9
16		2018	49,080,859	158,694	2,206,815	67.8
17	Bank of Baroda	2014	9,324,068	1,064,628	3,431,210	38.1
17		2015	11,181,282	1,119,036	3,707,981	45.3
17		2016	13,505,724	1,703,036	4,990,386	43.3
17		2017	16,202,834	929,577	4,670,010	36.3
17		2018	20,038,298	2,034,921	5,265,393	37.6
18	CFC Stanbic Bank Ltd	2014	180,998,985	702,822	3,180,512	68.1
18		2015	208,451,915	907,305	5,364,849	74.7
18		2016	214,682,729	1,751,812	6,266,995	79.2
18		2017	239,407,877	5,451,192	10,587,835	95.9
18		2018	280,953,012	7,750,141	11,722,208	85
19	Development Bank of Kenya	2014	16,944,142	166,227	1,153,472	55.5
19		2015	16,942,714	127,146	1,358,092	84.5
19		2016	16,418,382	281,257	1,265,375	81.3
19		2017	16,319,924	799,887	1,071,312	96.3
19		2018	15,323,111	1,234,398	1,014,495	89.1

20	Fidelity Commercial Bank Ltd	2014	3,020,283	30,841	166,324	36
20		2015	4,113,812	54,066	245,463	57.7
20		2016	4,173,602	70,744	265,329	67
20		2017	5,378,048	71,404	241,076	67.8
20		2018	7,015,823	59,127	288,464	54.8
21	First Community Bank Ltd	2014	15,278,026	1,293,281	906,739	70
21		2015	14,564,631	2,185,319	1,041,927	65.3
21		2016	14,962,089	2,866,113	264,274	64.5
21		2017	17,359,968	3,130,312	242,697	56.3
21		2018	17,880,462	3,276,667	267,915	79.6
22	Gulf African Ltd	2014	19,753,647	31,491	363,369	85..1
22		2015	20,836,369	30,538	440,047	66.8
22		2016	22,780,557	57,976	465,249	74.1
22		2017	26,896,765	34,130	558,590	88.9
22		2018	28,857,611	114,421	654,178	91.9
23	Habib Bank Ltd	2014	9,803,487	56,567	214,686	19.1
23		2015	10,229,979	52,095	341,300	28.1
23		2016	11,449,225	42,508	468,814	52.6
23		2017	11,781,110	57,304	271,304	48.2
23		2018	11,520,665	51,508	902,061	54.7
24	Orient Commercial Bank	2014	7,857,515	294,302	556,759	36.2
24		2015	8,496,350	233,473	673,302	52.8
24		2016	9,920,247	404,376	591,988	67.9
24		2017	10,576,525	355,980	576,702	65
24		2018	10,515,015	256,750	574,154	65.3

25	Trans-National Bank Ltd	2014	10,239,922	90,775	485,616	52.4
25		2015	10,452,691	79,500	584,214	56.1
25		2016	10,372,441	96,842	561,552	59.1
25		2017	10,241,368	80,248	435,393	60.1
25		2018	10,235,524	63,391	443,102	71.1
26	UBA Kenya Ltd	2014	4,755,787	1,161	165,901	156
26		2015	7,781,237	1,182	294,752	125.6
26		2016	5,601,281	246	303,220	75.7
26		2017	6,504,732	112,812	250,667	71.8
26		2018	7,086,915	67,532	70,909	73
27	Bank of India	2014	3,290,338	32,397	11,527	36.6
27		2015	4,552,094	35,489	17,148	42.3
27		2016	5,985,452	36,927	15,779	48.2
27		2017	6,436,523	40,190	15,288	39.1
27		2018	7,149,313	37,642	17,450	43.2
28	National Bank of Kenya Ltd	2014	122,864,886	7,048,129	3,907,301	55.5
28		2015	125,295,035	9,963,684	5,866,846	78.4
28		2016	115,114,374	26,768,991	4,308,945	64.9
28		2017	109,942,042	23,878,080	3,254,365	60.9
28		2018	115,143,443	26,993,150	2,909,683	61.2
29	Credit Bank Ltd	2014	6,184,951	455,550	503,081	73.6
29		2015	8,963,969	452,421	599,828	86.7
29		2016	9,742,374	150,400	771,692	52.1
29		2017	14,465,074	136,272	739,499	60.6
29		2018	17,727,842	154,175	898,051	56.9

30	Spire Bank Ltd	2014	16,589,359	880,787	1,164,245	62
30		2015	14,469,562	1,308,961	1,098,801	81.7
30		2016	13,802,498	436,428	965,335	82.9
30		2017	11,147,949	721,560	787,361	152.9
30		2018	9,223,078	1,022,888	711,998	117.2
31	Guaranty Trust Bank Ltd	2014	32,991,926	268,933	1,117,763	51.5
31		2015	29,374,062	116,916	1,335,623	56.4
31		2016	29,619,072	481,405	1,310,024	54.3
31		2017	27,627,849	879,046	1,008,434	62.6
31		2018	25,323,367	1,852,979	962,379	59.9
32	Guardian Bank Ltd	2014	14,880,070	111,055	937,860	58
32		2015	14,609,492	164,326	1,049,382	85.2
32		2016	14,994,639	150,287	1,005,612	59.6
32		2017	16,096,639	48,506	861,403	58.4
32		2018	16,479,843	49,500	366,416	61.3
33	I&M Bank Ltd	2014	34,333,565	765,020	15,443,886	55.9
33		2015	38,534,309	2,845,186	14,744,308	50.6
33		2016	45,945,451	2,224,967	15,953,985	51.9
33		2017	56,565,100	4,399,030	17,875,550	63.1
33		2018	75,820,900	5,185,470	18,928,190	56.8
34	Jamii Bora Bank Ltd	2014	10,012,421	327,784	457,626	65.8
34		2015	13,618,752	166,992	1,151,063	74.5
34		2016	12,134,176	1,000,365	1,441,073	93.3
34		2017	9,396,360	488,207	1,134,935	127.7
34		2018	9,053,139	434,030	178,240	93.4

35	Middle East Bank (K) Ltd	2014	3,562,014	58,451	385,920	82.3
35		2015	2,987,801	62,598	378,235	83.2
35		2016	4,041,413	64,911	369,803	87.4
35		2017	1,156,785	27,270	276,284	77.8
35		2018	1,112,261	723,349	256,885	70.5
36	Paramount Universal Bank Ltd	2014	1,314,153	121,752	681,026	66.2
36		2015	1,449,830	304,891	784,770	60.9
36		2016	1,555,345	479,961	886,321	75.9
36		2017	1,574,544	539,695	634,651	64.4
36		2018	1,661,565	488,568	643,340	69.3
37	Prime Bank Ltd	2014	7,735,020	100,783	2,848,182	58.3
37		2015	8,725,207	152,022	3,627,563	75
37		2016	10,833,993	209,484	4,027,947	78.4
37		2017	11,175,783	5,158	3,741,460	53.3
37		2018	19,313,389	25,108	4,245,144	70.2
38	Victoria Commercial Bank Ltd	2014	2,615,075	109,792	902,899	76.3
38		2015	3,070,593	131,244	1,325,394	75.9
38		2016	4,324,615	152,928	1,302,865	78.2
38		2017	4,502,492	188,363	1,274,363	78.8
38		2018	6,207,062	644,866	1,698,639	6.07

Source; Financial Reports, CBK.

Appendix II:

List of Commercial Banks in Kenya

NO	Bank	NO	Bank
1	Bank of Africa Ltd	22	Bank of India
2	Kenya commercial Bank Ltd	23	National Bank of Kenya Ltd.
3	Bank of Baroda (K) Ltd	24	Barclays Bank of Kenya
4	African Banking Corporation Ltd.	25	Chase Bank (K) Ltd (On Receivership)
5	NIC Bank Ltd	26	Standard Chartered Bank (K) Ltd
6	CFC Stanbic Bank Ltd	27	Commercial Bank of Africa Ltd
7	Citibank N.A Kenya	28	Consolidated Bank of Kenya Ltd
8	Co-operative Bank of Kenya Ltd	29	Credit Bank Ltd
9	Development Bank of Kenya Ltd	30	Dubai Bank Kenya Ltd (On receivership)
10	Diamond Trust Bank (K) Ltd	31	Eco bank Kenya Ltd
11	Equity Bank Ltd	32	Spire Bank Ltd
12	Family Bank Ltd	33	Guaranty Trust Bank Ltd (Formerly Fina Bank Limited)
13	Fidelity Commercial Bank Ltd	34	Guardian Bank Ltd
14	First Community Bank Ltd	35	Giro Commercial Bank Ltd
15	Gulf African Bank Ltd	36	Habib Bank A.G Zurich
16	Habib Bank Ltd	37	I&M Bank Ltd
17	Imperial Bank Ltd (On Receivership)	38	Jamii Bora Bank Ltd
18	Sidian Bank Ltd	39	Middle East Bank (K) Ltd
19	Oriental Commercial Bank Ltd	40	Paramount Universal Bank Ltd
20	Trans-National Bank Ltd.	41	Prime Bank Ltd
21	UBA Kenya Bank Ltd	42	Victoria Commercial Bank Ltd

Source: Author (2019)

Appendix IV:

Data Collection Sheet

Name of the Bank…….

Date Registered/Licensed…….

Physical Address: ……

Part 1: Market Risk.

Elements	2014	2015	2016	2017	2018
Interest Rate Risk					

Part 2: Credit Risk

Elements	2014	2015	2016	2017	2018
Loss On Loans & Non-Performance					

Part 3: Liquidity Risk

Elements	2014	2015	2016	2017	2018
Funding					

Appendix V:

Data Collection Plan

Operational Efficiency	Financial Risk Management Framework		
ROA	Return on Asset was measured as the ratio and net income to average total asset for the respective bank. A simple average ROA for years from 2014 to 2018		
Diagnostic	Review Risk Management Structure	Review Risk Management Related Policies	Review Risk Infrastructure
Risk Identification	Define Process Risk Library	Define Loss Capture Template	
Risk Assessment & Measure	Conduct Risk Profile Assessment	Conduct Loss Data Analysis	Design Risk Measurement Models
Risk Control & Mitigation	Conduct Control Assessment	Define Corrective Action Plan	Design Limit Framework
Risk Monitoring & Reporting	Design Reporting Templates	Define Reporting Workflow	

Source: Author 2019