INFLUENCE OF FINANCIAL RISK ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

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Influence of Financial Risk on Financial Performance of Commercial Banks in Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university

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DEDICATION

This thesis is dedicated to the creator the Almighty God who gave me physical and mental strength to undertake and accomplish this thesis in the prescribed period of time. To my children Alvin, Ashley, Rohan, and to entire family at large and friends for the support received during the period.

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LIST OF ABBREVIATION AND ACRONYMS

ADF	Augmented Dickey-Fuller tests
BCBS	Basel committee on banking supervision.
BS	Bank size taken as total assets of bank
CR1	Loans to total deposit to measure Credit risk
CR2	Capital adequacy to measure credit risk
CR3	Gross non-performing loans to total loans to measure credit risk
DCR1	First difference Loans to total deposit
DCR2	First difference Capital adequacy
DCR3	First difference gross non-performing loans to total loans
DFX	First difference Foreign exchange risk
DIR1	First difference loans to total assets ratio
DIR2	First difference interest income to total loans ratio
DLQ1	First difference liquid assets to total assets
DLQ2	First difference liquid assets to total deposits
DMR	First difference market risk
DROA	First difference Return on assets
DROE	First difference Return on equity
FX	Foreign exchange risk
IR1	Loans to total assets ratio to measure Interest rate risk
IR2	Interest income to total loans ratio to measure Interest rate risk
Ln	The natural logs of the variables
LQ1	Liquid assets to total assets to measure Liquidity risk,
LQ2	Liquid assets to total deposits to measure Liquidity risk,
MR	Market risk
NIM	Net Interest Margin
NSE	Nairobi Securities Exchange
OLS	ordinary least square

PP	Phillips-Perron test of unit root
ROA	Return on assets
ROE	Return on equity
SMM	Standardized measurement method
VAR	Value at risk

DEFINITION OF TERMS

Commercial Bank	is a financial institution which provides services, like accepting deposits, giving business loans and auto loans, mortgage lending, and basic investment products like savings accounts and certificates of deposit (Ngumi, 2013).
Credit Risk.	The potential that a bank borrower or counterparty will fail to meet the obligation in accordance with the agreed terms and conditions (Kolopo & Dapo, 2015).
Financial Performance	is a measure of how well a firm can use assets from its primary mode of business and generate revenues. This term is also used as a general measure of a firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation (Bessis, 2010).
Financial Risk	is defined as the added variability of net returns to owner equity that results from the financial obligation associated with debt (or capital lease) financing (Jean & Mark, 2000).
Foreign Exchange Risk	relates to the effect of an expected exchange rate changes on the value of the firm. It refers to the direct and the indirect loss on the firms' cash flows, assets, and liabilities due to unexpected exchange rate (Gino, Lucio & Ilias, 2014).
Interest-Rate Risk	Interest rate risk refers to risk of reduction net interest income of a bank resulting from change in interest rates (BCBS, 2000).

Liquidity Risk	Liquidity risk is the potential for loss to an institution, arising from either its inability to meet its obligations or to fund increases in assets as they fall due without incurring unacceptable cost or losses.(Ahmed & Ahmed, 2012).
Market Risk	is defined as the risk of losses that arises from movements in market prices. That is changes in market prices that result from general market behaviour and changes in market prices which are specific and are independent of general market movements (Pariyada 2013)
Return on Assets	is the total income owned and controlled by a Bank divided by total assets (Bessis, 2010).
Return on Equity	is the total income owned and controlled by a Bank divided by total Equity (Olusanmi, Uwuigbe, & Uwuigbe 2015).
Risk Management	is the systematic use of organisation-wide processes of identify, assess, manage, and monitor risks such that aggregated information can be used to protect, release, and create value (Shahbaz , Tabassum, Muhammad, Mansoor , Hafiz & Yasir, 2012).

ABSTRACT

The main objective of the study was to determine the influence of financial risk on performance of commercial banks in Kenya. The specific objectives were to determine the influence of market risk on performance of commercial Banks, to determine the influence of credit risk on performance of commercial Banks, to determine the influence of interest rate risk on performance of commercial Banks, to determine the influence of foreign exchange risk on performance of commercial Banks, to determine the influence of liquidity risk on performance of commercial Banks and to determine the influence of bank size as a control variable on performance of commercial Banks in Kenya. Despite the banking sector stability and resilience in 2015, two non-systemic banks, were placed in receivership by the Central Bank of Kenya this was attributed to liquidity risk and failure to owner debt and lack of adequate provision for non-performing loans. Both primary and secondary data were used in the study. The research philosophy that was adopted for this research is that pursued by positivists and descriptive survey research design was applied. The population for secondary data were the 44 commercial banks in Kenya of which 2 were under receivership and one under statutory management. Panel data for 30 commercial banks that had data for 10 year period from 2006 to 2015 were obtained from the central bank of Kenya and banks website. For primary data the population was 220 respondents comprising risk manager, operations manager, general manager and credit manager all were used in the study. Self-administered questionnaire was used. Descriptive statistics, correlation analysis, and random and fixed effects were used for secondary data using E-views software while for primary spss-v 22 where descriptive analysis and inferential where factor analysis, correlation and regression were used. The findings were under longer period that capture various trade cycles credit risk had a significant negative relationship with performance hence managers should aim at reducing this risk to increase performance while market risk and interest rate risk had a significant positive relationship with performance this means that managers should expect increase in performance when interest rate and foreign exchange increase. The thesis recommend that Bank managers should adopt policies to control debtors figure relative to total capital as this increases credit risk, credit worthiness of would be borrowers is assessed and collateral which should be wholly ensured, credit limits which could be based on group authority. Commercial banks should focus on hedging and forecasting the macroeconomic factors that determine interest rates rather than the focusing on interest rates .Managers should ensure that commercial banks invest excess cash in productive assets. This ensures that they do not hold excess cash at the expense of fixed assets that can improve profitability. Managers should steer their banks toward trading in foreign exchange as this will improve performance of the banks as increase in foreign exchange risk leads to increase in performance or profitability Organisation monitoring all open positions arising from bank activities. Like financial risk early warning mechanism so that managers can take effective real time comprehensive management to reflect banks financial position

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Risk Management is not new for financial institutions but recent development in business environment has been of concern of senior management (Cooper, 2000). The economic crisis of 1980s forced the central bank governors of the G-10 countries to take proactive measures to safe guard financial risk (BCBS, 2009). The capital committee introduced capital requirements systems on the basel capital cord whose original focus was on credit risk with requirements for exposure to market risk. The Basel accord was refined with Asian crises of 1997 with the isseu of new capital adequecy framework,the 1988 Basel 1 focused on capital requirements which which centred on credit risk environment. The Basel II of 1999 had three pilars which were the minimum capital requirement, supervisory review aind market descipline. Within pillar 1 three types of risks were identified thus credit risk, market risk and operation risk. Banks were to assess their capital requirement using simplified regulatory standard or their own internal models. The principle element in pillar 2 supervisory reveiw was that banks were to determine interest rate risk in their banking book where national supervisors require banks to carry out stress test on their exposure to determine if banks are holding capital comunsarate to interest rate risk. Thus pillar 2 adds uncertainity as it allows supervisors to excercise sensible discreation and ability to varry capital requirement (Robert, 2003).

In financial crisis of 2007 to 2009 bank regulators crafted Basel III Capital requirements aimed at providing banks with sufficient reserves to enable withstand any crisis in future which focused on credit risk, liquidity risk, and market risk (Simone, 2011). Bank systems face excessive risks though as per Markowitz portfolio theory which assumes that a risky investment earns more profits. Regulatory agencies aim at reducing happening of crises, but banks desire high profits so that they can pay their clients for

the funds advanced. These procedures are linked to high risks when providing financial services they assume different financial risk (Helder, Délio & Renato, 2011).

In the present day's explosive and unpredictable atmosphere, all financial institutions are in front of hefty risks including credit risk, operational risk, liquidity risk, market risk, foreign exchange risk, and interest rate risk, along with other business risks (Khizer, Muhammad & Shama, 2011). In 2003 Euro bank collapsed with billions of shillings of Parastatals which caused crippling liquidity against regulatory central bank of Kenya, this forced the government to pass the money laundering bill and Credit Reference Bureaus in 2009 (Sundararajan & Balino, 2011). Liquidity risk arises due to a bank in-ability to meet its obligation without incurring losses, thus it's a risk of being unable to liquidate a position at reasonable price and timely (Arif & Anees, 2012). Commercial bank activities include provision of services, engaging in financial intermediation, products loans to customers, and overall management of risk. This calls for financial systems to be analysed from a functional perspective other than institutional perspective as the functions are more stable for a long period of time than the institution (Rudra & Jayadev, 2009). Financial risk management enables financial institution to put in place safeguards to reduce the potential losses that emanate from uncertainties in the financial markets (Aleksandra, Dalia & Julija, 2014).

Risk management emerged as a policing activity aimed at measuring risk for investment and business institution. In pre-Markowitz era financial risk was considered as a correcting factor for expected return, risk-adjusted returns being defined on an ad-hoc basis Markowitz showed that to measure risk associated with return of each investment, then standard deviation can be used (Aleksandra *et al*., 2014). These old measures are advantageous for allowing immediate preferential order for investments. In order to understand the relationship and aim at minimizing risk, use of financial theory and risk management has benefited investors making business very competitive. Most investments which were valued through financial accounting methods are increasingly judged on risk adjusted basis (Giorgio, 2002). Most organisations check compliance before engaging in business and this has enabled risk managers to reduce losses from

operation risk increasing profits and value of a firm. Risk management identifys loss exposures for companies and selection of appropriate techniques for reduction of such exposures (Rejda, 2003).

Financial risk management has been the core determinant for most investment decisions made by investors. Most investors perceive that option prices convey the degree of risk that the market reflects about an investment. When predicting average return, option prices are silent to this respect especially where conventional wisdom is applied (Peter & Jimings, 2012). Kempf, Merkle and Niessen (2012) in their study over 900 non-financial stocks from the Frankfurt Stock Exchange for the period 1962 to 2006 showed that effective attitudes have a positive correlation between high expected return and low risk which violates the prediction of the standard finance theory. The correlation was stronger in participants with lower financial literacy relative to those with higher financial literacy as they are able to correct their cognitive perception when confronted with the task of estimating risk and return. Thus confidence contributes to more driven evaluation; this is supported by other authors who argued that firms can use advertisement to change behaviour of investors (Fehle, Tsylakov & Zdorovtsov, 2005). According to Sumbramanyan (2008) in their study which builds on growing literature in behavioural finance posits that emotions and effective attitudes impacts on ratings of stocks and returns hence financial decisions making.

According to Obamuyi (2013) performance of banks in Nigeria over the last decade remained unimpressive. The profit before tax between 2002 and 2005 fluctuated and declined opportunities for banks. This could have been caused by the global economic crises and the fact that some of the criteria employed to measure the performance of the banks have been compromised. In Ross (2011) the Black and Scholes paradigm is found to be startling as an investor value options without having knowledge of expected return, Standard finance theory postulates that rational investors tend to balance risk and expected return, leading to positive correlation between risk and expected return which investors can use to make judgments based on fundamental information (Weber & Nosic, 2012).

Over the last two decades, great focus has been on financial performance in numerous banks in Africa. Many bank managers are looking for means of improving performance by undertaking a primary transformation of banking business (Olweny & Shipho, 2011). Thus stiff competition has emerged forcing banks to implement expansion strategies. Africa's banking has introduced new forms of lending with improved technology aimed at increasing performance, however these changes threaten African banking sector as the banks have to prepare complicated balance sheets which have greater risks in assets and liabilities. New lending techniques to small and medium enterprise with a target of improving performance has lead to default hence credit risk, this constitutes large portion of loans in Africa. Introduction of microfinance and Internet banking in African banking sector has been risky, as majority of customers are poor or not familiar with Internet services (Ongore & Kusa, 2013).

There also arises extreme changes in value of a currency against other world currencies for most African countries this is be due to difference in accounting, markets, taxation auditing standards; economic, diplomatic or political conflict leading to exposure to foreign exchange risk. Some securities or asset which banking sector deal in at times may not be traded quickly without incurring losses, this leads to liquidity risk in banking sector or may arise when liabilities of a bank cannot be met when due leading to extra charges on the banking sector. A change in market risk factors may also affect the value of investment or trading portfolio to decrease, among other factors include foreign exchange rates, stock prices, commodity prices and interest rates (Cicea & Hincu, 2009).

1.1.1 Kenyan Banking Sector

There are forty four commercial banks in Kenya of which ten of them are registered on the Nairobi Securities Exchange (NSE) as per central bank of Kenya report 2015, of which 28 banks are locally owned and14 are foreign owned. For banks, the central bank of Kenya act cap 491 oversees there licensing procedure. The CBK gets involved in order to protect the interest of the investors and clients. Other legislation guiding banks are the banking act chapter 488 1st Jan 2013, the constitution of Kenya 2010, the national

payment system act 2011 (CBK, 2015). Kenyan banking sector has been ahead of its neighbours, as it has been accredited for its size and diversification (Muteti 2014). Kenya's standard indicator for financial development stood at 23.7% in 2008, Tanzania had 12.3% Uganda 7.2% and relative to a median of 12.3% for Sub-Saharan Africa (Ngumi, 2013).

Ngari (2011) researched on listed firms' exposure to exchange rate risk for the ten year period 2001 to 2010. The findings were that major hard currencies of international transaction were sources of foreign exchange risk for firms on NSE. The US dollar was the most dominant source of exchange rate risk at both the firm and sector levels. Financial risk can lead to bankruptcies of banks this can cause damage to the entire economy hence justifying necessity to regulate the entire banking system. It is also necessary to regulate and supervise the financial sector by checking information asymmetry (Palvia & Patro, 2011).

1.2 Statement of the Problem

The International Monetary Fund (2011) highlighted that banks failed in the 2007 financial crisis due to poor risk management and over reliance on short-term wholesale funding which quickened the failure of a number of banks. Despite the banking sector stability and resilience in 2015, three non-systemic banks, chase bank and Imperial Bank ltd were under receivership in the third quarter of 2015. Dubai Bank ltd went into liquidation in the second quarter which was attributed to liquidity risk, failure to owner debt for bank of Africa and lack of adequate provision for non-performing loans. Charter house bank was also placed under statutory management this was due to financial risk (CBK 2015). From the CBK report of 2015 two institutions didn't have required liquidity ratio of 20% and one didn't have required total capital to total risk weighted asset ratio (capital adequacy) of 14%.

According to BCBS (2015) banks should consider relationship between various risks and should identify measure, monitor and control risk with the aim of maintaining adequate capital against risks and compensate for risks incurred. Thus minimum capital is required to absorb losses in continued operations; however in the recent crisis the losses experienced by banks exceeded a minimum capital requirement which was attributed to financial risk (BCBS, 2009, 2010). This led to Basel committee to revise the regulation coming up with incremental risk capital charge and stressed value at risk. .

In Kenya several authors have researched on the relationship between financial risk and financial performance for commercial banks for a period of five years found credit risk, interest rate risk, foreign exchange risk, and liquidity had a significant negative relationship to performance (Muteti, 2014; Mwangi 2014). Other authors found contradicting results where the relationship was positive and significant (Lukorito, Muturi, Nyang'au & Nyamasege 2014; Tarus, Chekol & Mutwol 2012). The authors recommended further research to be done for a longer period to capture periods of various trade cycles in order to give broader dimension for the problem. This research intends to fill the knowledge gap in the long period to determine the situation for Kenya banks when long periods are considered.

1.3 Research Objectives

The study was directed by general objective and the specific objectives

1.3.1 General Objective

The main objective of this research was to determine the influence of financial risk on financial performance of commercial Banks in Kenya.

1.3.2 Specific Objectives

i) To establish the influence of credit risk on financial performance of commercial Banks in Kenya.
ii) To establish the influence of interest rate risk on financial performance of commercial banks in Kenya.
iii) To establish the influence of liquidity risk on financial performance of commercial banks in Kenya.
iv) To determine the influence of foreign exchange risk on financial performance of commercial banks in Kenya.
v) To determine the influence of market risk on financial performance of commercial banks in Kenya.
vi) To determine the control effects of bank size on the relationship on financial performance of commercial banks in Kenya.

1.4 Research Hypotheses

i) **H_{o1}:** Credit risk has no significant influence on financial performance of commercial banks in Kenya.
ii) **H_{o2}:** Interest rate risk has no significant influence on financial performance of commercial banks in Kenya.
iii) **H_{o3}**: Liquidity risk has no significant influence on financial performance of commercial banks in Kenya.
iv) **H_{o4}:** Foreign exchange risk has no significant influence on financial performance of commercial banks in Kenya.
v) **H_{o5}:** Market risk has no significant influence on financial performance of commercial banks in Kenya.
vi) **H_{o6}:** Bank size has no significant control effects on the relationship between financial risk and financial performance of banks in Kenya.

1.5. Significance of the Study

This study is relevant to various stake holders as highlighted below. The government of Kenya as it seeks to control financial institution especially banks as they provide essential services, provision of jobs which financial risk can have a negatively impact and for tax purposes. For investors influence of risk is important when making investment decisions, lack of information can result into bankruptcy and threaten the collapse of entire finance sector due to financial losses. Thus this research is also vital to prospective investors in the banking industry and the country's economy at large as banks are the only institutions which trade on customers funds hence the investors are eager to know the exposure of their investments to risk and the risk categories.

Like any other research, the findings will be used as a reference for further studies and spark off further research on new financial risk management methods and performance of the banks. Commercial banks in Africa will learn from this Kenyan study in order to improve on their performance. The study findings will inform them on how financial risk affect financial performance and how the various types of risks interact with each other hence save on the costs of conducting cost benefit research in their institutions.

1.6 Scope of the Study

The study covered 44 commercial Banks licensed by the Central Bank of Kenya. The commercial banks that were used in the study are those that had published accounts for the 10 year period from 2006 to 2015 and were in operation by close of business of 31st December 2015.

1.7 Limitations of the Study

For secondary data half of the data was obtained from the central bank of Kenya, the rest was obtained from the commercial banks website, some banks did not have the required data on their website hence having only complete data for 30 commercial banks being used in this research instead of all commercial banks leading to generalization which may be limited.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on financial risks inherent in banking business. It discusses the key theories underlying banks risk, develops a conceptual framework and expounds on the research gaps on influence of financial risk on financial performance of banks in Kenya.

2.2 Theoretical Framework

The theoretical framework shows the understanding of theories and models by the researcher for concepts relevant to research topic and the whole area of field which the research relates (Kiaritha, 2014). The theories provide a generalized explanation to occurrence of issues affecting research as a whole hence the researcher should be conversant with those theories applicable to his area of research (Kombo & Tromp, 2009). The theoretical framework helps the researcher to identify the variables of the study providing the general framework for data analysis and selection of applicable research design (Aguilar, 2009).

The selection of a theory depends on its appropriateness, application, and explanatory power to the study which should be relevant to the study area of the research topic and it connects the researcher to existing knowledge (Hannah, 2015). The theories reviewed in this study are Risk management theory, Intermediation theory and Prospects theory. The theories were reviewed on the interactions between the dependent and independent variables

2.2.1 Theory of Financial Intermediation

This theory was advanced by Akerlof, Benson and Diamond (1980) among other proponents who viewed financial intermediation as a combination of institutional tool and market satisfying needs of different economic entities whose main aim is to accumulate money from public and legal entities and give it to borrowers on commercial conditions hence exposure to financial risk (Rayberg, 2002). It was based on minimizing costs necessary for stimulation of behaviour of borrowers in creditors' interest (Sharp *et al.*, 2011). Ukrainian scientists Vishnevsky and Matyushkin (2008) showed that financial intermediation is a modification of traditional theory that described functioning of banks using prices, quality, quantity and temporal information of assets which was due to invention of financial innovation.

The financial intermediation tends to overlook the traditional function of banks in transfer of risk and explaining little why intermediation should perform such function (Sharp, Alexander & Bely, 2011). The traditional theory of financial intermediation was based on transaction and information approach. The major factor used in financial intermediation is grounded on information asymmetry and it's based on the type moral hazard or adverse selection which requires costly verification and also auditing procedures. Information asymmetry generates imperfection of the market. Perfect financial markets in the neoclassic theory tend to show that no individual can influence the prices, there are no transaction costs, borrowing conditions are identical and all investors have homogeneous expectation (Rayberg, 2002). Studies on information asymmetry approach especially the problematic relationship of the bank and depositor; special attention was given to factors that make depositors to withdraw their money from bank which consequently the leads to liquidity problems hence liquidity risk.

The next approach was based on the method of regulation of monetary creation of saving and financing the economy, the method of regulation which influences the solvency and the liquidity of intermediaries hence ability of refining and recovery of debts (Diamond & Rajan, 2000). Depositors face liquidity risk from perception of

requiring liquid funds. The trade-off between liquidity and profitability make them to hold their funds in form of deposits, though according to Diamond model depositors do not have prior knowledge on when they will experience liquidity risk. In order to provide depositors liquid assets banks are required to sell more profitable and less liquid assets thus reducing profit opportunities if many depositors withdraw their funds, other customers may follow suit a behaviour referred to as bank run hence exposing the banks to liquidity risk (Allen & Alexander, 2009).

Fama (1980) developed the third approach founded on transaction cost which was based on differences on technologies used. Transaction cost include transfer cost, cost for research evaluation and monitoring thus the role was to transform the characteristic of financial assets offering them with liquidity and opportunities for placement. Financial intermediaries a voids wasteful duplication of audit cost on part of all creditors. On the other side loan commitment may reduce borrowing rate hence reduction in interest rate hence profits and this can reduce moral hazard on the borrowers' side and providing basis for debt renegotiation (Rayberg, 2002).

Schollens and Van (2000) argue that intermediation reduces participation costs but the world has experienced direct participation of the public in financial markets. Proponents of this theory posit that there has been a reduction in trading costs which enabled direct participation of house-holds. Intermediaries in their duty of risk management does not explain the dramatic rise in mutual funds and wide spread use of financial derivatives (Sharp *et al.,* 2011). The most important rationale of financial risk management is the prevention of bankruptcy of a firm induced by monetary and financial factors which targets the firms' balance sheet against severe losses of monetary nature and uncertainties like interest rate risk, exchange rate risk, and credit risk (Schollens & Van, 2000). The amended theory reflects the market as dynamic, coupled with products innovation and financial transformation, viewing financial intermediaries as entrepreneurial providers of financial services with customer orientation for both borrowers and savers with risk management taking the central stage.

2.2.2 Prospect Theory

This theory has become particularly important in behavioural finance due to its application of expected utility theory. The proponents of prospects theory were of the idea that individuals treat gains and losses differently, they argue that individuals get motivated not to maximize expected financial returns but rather expected utility of their actions (Kahenman & Tversky, 1986). The application of utility theory to prospect theory is based on expectation of expected utility of its outcomes (Paul, Mark, Nigel & Emma, 2001). In asset Integration a prospect is acceptable if its utility exceeds the utility of other assets in terms of monetary outcomes (Nicholas, 2012). The prevalence of risk aversion is best known for generalizing risky choices. The theory posits that the disutility a rising from a fall in wealth is greater than the utility arising from an increase in wealth of the same size. Thus individuals require risk premium to engage in trade with an element of risk in return, reference points for dividing gains and losses vary, depending on performance targets and past history. Individual behaviour in financial markets is affected by social influence which maximizes the empirical pattern of transactions on the market. Thus different behaviours' can be understood as responses to different market circumstances leading to different implications (Paul *et al*., 2001).

Prospects theory recognizes that the utility curve is not a straight line. It advances the notion of utility in useful and accurate direction. It add insight that utility curve differ in domains of gains from losses (Plott, Charles, & Kathryn, 2007). The shape of the prospects theory value curves is similar across individuals. The curve is S- shaped thus its convex below reference point. The slope of the curve measures sensitivity to change. The curve is more sensitive to origin and become less progressively less sensitive. The s curve means people tend to be risk averse in domain of gains and risk seeking in the domain of losses (Paul *et al.,* 2001).

2.2.3 Risk Management Theory

David (1997) developed this theory aiming to study why risk management was required, and outlines theoretical underpinning under contemporary bank risk management; its emphasis is on market and credit risks. The theory indicates that market and credit risks would have either direct or indirect effect on banks survival (Eichhorn, 2004). One would expect the credit risk indicators to influence banks profitability if there is no effective and efficient credit risk management (Ngugi, 2001). This theory identifies major source of value loss as Market risk being a change in net value of asset due to change in interest rate, exchange rate, equity and commodity prices (Wu & Olson, 2010).

Regulators are concerned with overall risk and have minimum concern with individual risk of portfolio components as managers are capable of window dressing the bank position. The need for total risk show that measurement of risk cannot be centralized as risk of a portfolio is not just a sum of component as per Markowitz theory. This implies that portfolio risk must be driven by portfolio return which is invariant to changes in portfolio composition (Beverly, 2015).

Regulatory requirements and alternative choices require managers to consider risk return trade off, Measurement of risk is costly thus bank managers compromise between precision and cost (Sovan, 2009). Trade off will have profound effects on any method adopted by the bank. They have one risk measurement goal knowing to a high degree with precision and the maximum loss that the bank will likely experience (Muhammad & Bilal, 2014). Regulators may set capital requirements to be greater than estimated maximum loss to ensure non-failure. Risk management theory has two principle approaches to measurement of risk, scenario analysis and value at risk (Sovan, 2009). Scenario analysis approach does not require distribution assumption of the risk calculation and it's very subjective and assumes that future results will resemble those of the past (Wilfred, 2006).

Value at risk (VAR) uses asset return distribution to estimate the potential losses. Monte-Carlo simulation and analytical VAR method are two principle method of estimating VAR and they enable managers to estimate forecast. They have advantage of computational efficiency and tractability though they may show non-normal distribution experiencing fat tails reflecting inconstancy of return volatility. This method incorporates sound economic theory that incorporates market structure (Muhammad & Bilal, 2014). Where there is non-normal distribution student t is appropriate, it's useful for fat tails distribution since it's aimed at describing the behaviour of portfolio returns. Analytical value at risk uses standard portfolio theory; the return distribution is described in terms of variance and covariance representing risk attributes to a portfolio over horizon (Sovan, 2009). In this research market risk measurement utilised value at risk (VAR).

2.2.4 Finance Distress Theory

Corporate distress was first classified and modelled in 1996 by beaver. He noted that financial distress as liquidation, bankruptcy, mergers absorption or major structural changes to a company. In this grey area where prediction of financial distress is difficult there is an overlap between non failed and failure. In most studies filling of bankruptcy occurs where the business deteriorates making it difficult to meet its short term obligations when they fall due as the key factor (Balwin & Scott, 1983)

Financial distress is accompanied by many factors including failure to pay debts when due, reduction or failure to pay dividends , current liabilities maturing faster than current assets , these activities may occur just before the payments due for outstanding debts (Whitaker, 1999). Boritz (1991) asserts that financial distress is characterised with bad economic conditions coupled with poor financial risk management. For commercial banks ability to provide cash to depositors and conditions that make depositors to rush to withdraw their deposits causing bank run should be monitored as this will put the bank in liquidity problems hence liquidity risk.

A proponent of this theory Wiggins (1984) relates sales decline and generation of negative profits to financial distress. When assessing causes of bankruptcy during crisis exogenous effects are to be considered, catalyst in times of bankruptcy, poor asset efficiency. Loss generation, insolvency and in times of credit crunch. Financial distress is linked to liquidity risk and credit risk. Financial literature has noted two types of financial distress which include indirect and direct costs. Warner (1977) asserts that indirect financial distress costs are consequence of running a company that can not meet its financial obligation. such costs are unobserved in nature and include opportunity costs.

2.3 Conceptual Framework

Conceptual framework is a graphical representation of the link between variables in a study basing from ideas developed from the researchers' perception of the research (Borg, 2005). For this research the dependent variable was financial performance which was measured by return on assets (ROA) and return on equity ROE, the independent variables were the risks highlighted by the Basel III including liquidity risk, credit risk, foreign exchange risk, interest rate risk and market risk. Bank size was included as a control variable. Risk management theory indicates that market and credit risks would have either direct or indirect effect on banks survival this have been utilised in the conceptual frame work. In risk management theory the method of regulation of monetary creation of saving and financing the economy influences the solvency and the liquidity of intermediaries and recovery of debts leading to liquidity risk and credit risk which were included in the conceptual frame work. Al-khouri (2011) researched on the effect of risk characteristics specific to bank on the performance of commercial banks from Gulf cooperation council (GCC) countries; liquidity risk and credit risk were considered hence they were also used in this research. Muteti (2014) used credit risk, interest rate risk, foreign exchange risk, to measure financial risk management and its effects on financial performance for commercial banks in Kenya, this research also adopted similar measures.

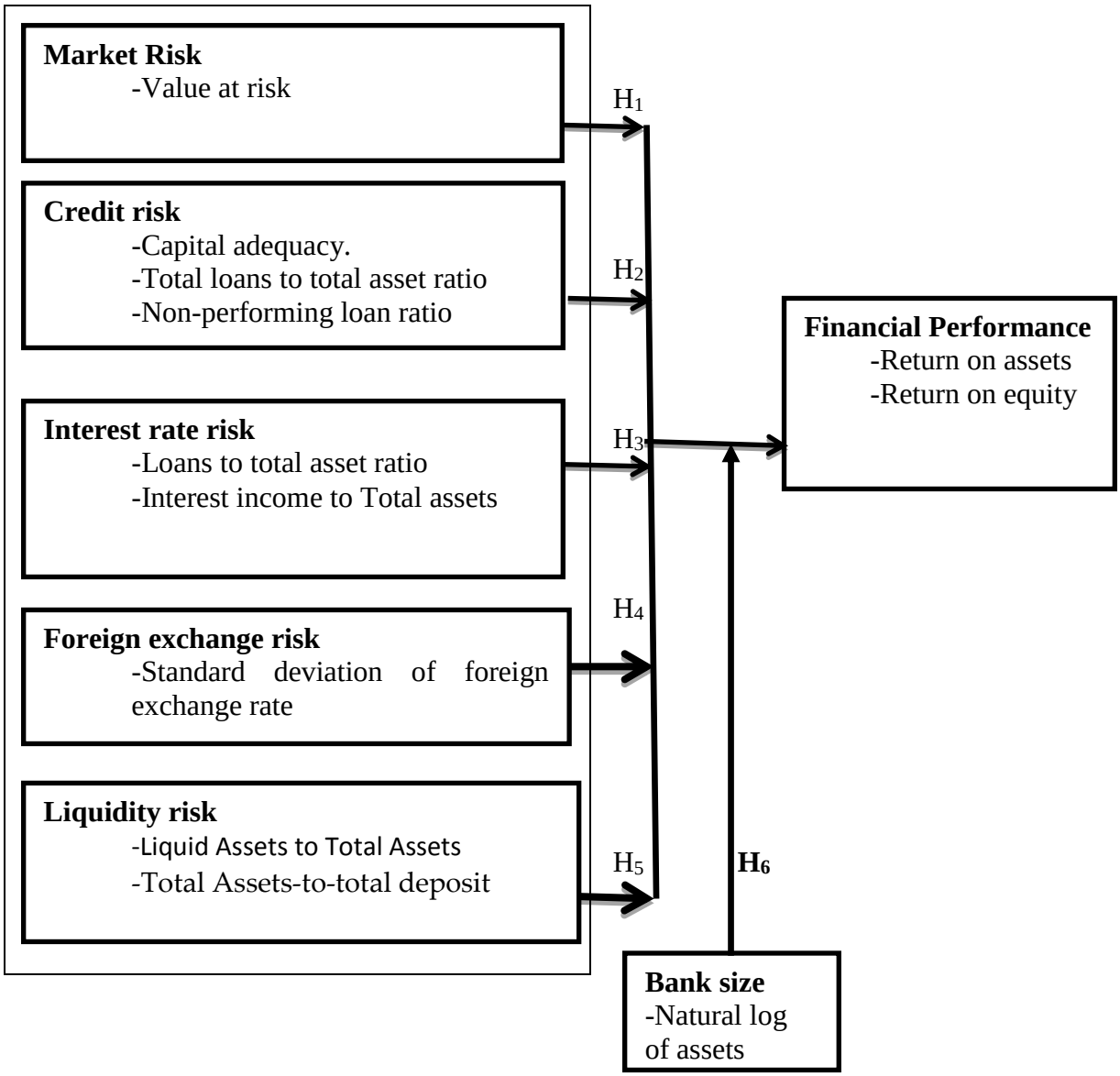

Figure 2.1: Conceptual Framework

2.4 Review of Variables

Most international institutions tend to adopt risk based supervision, where risk assessment is basically undertaken in order to formulate risk based audit plan. Risk assessment is considered an independent activity which aims to identify measure, monitor and control risk. Risk based supervision include identification of risk associated with the activities undertaken by the firms, evaluation of effectiveness of control system for monitoring business risk, then lastly drawing up risk matrix's for risks affecting banks. Risk assessment may use both qualitative and quantitative approach where business related data is used and qualitative where observations are made on site under behavioural finance (Ngugi, 2001). This section reviews variables used in this thesis and highlighted in the conceptual framework the independent variables include credit risk, interest rate risk, liquidity risk, market risk, foreign exchange risk, bank size as a control variable and bank performance as dependent variable.

2.4.1 Credit Risk

Banks loans are major source of credit risk other sources are interbank transactions, foreign exchange, trade financing, futures swaps, options, bonds and extension of commitment of guarantee. The sound practices set by Basel 1 committee include establishing credit risk environment which the board of directors have the responsibility of periodically reviewing and implementing credit risk strategy approved by the board of directors then setting procedures for controlling, monitoring and measuring credit risk (BCBS, 1999).

Secondly banks should operate within sound well credit granting criteria by establishing overall credit limits at the level of individual borrower depending on exposure and should have a process of approving new credit extension of credit limits which should be done at arm's length (Muhammed, 2012). The thirdly, banks should maintain appropriate credit administration measurement and monitoring process that is on-going, administration system of monitoring overall composition of credit portfolio and develop

to utilize an internal risk rating system in managing credit risk. Thus they should take into consideration potential future changes in economic conditions during assessment of credit and credit exposure (BCBS, 1999). Banks should ensure adequate control over credit risk by establishing independent on-going assessment system and ensuring credit granting is properly managed and is within credit limits and has in place early remedial action on deteriorating credits and similar work situation. Credit management principles applicable in banking institutions include the six Cs of character, capability, context, credibility, collateral and conditions (Aduda & Gitonga, 2011).

In bid to maintain adequate level of profitability, most banks take excessive risk but greater risk taking results into insolvency. Major banking problems are related to low credit standard for borrowers and poor management of portfolio. Muhammed (2012) posits credit risk may lead to credit events such as bankruptcy, failure to meet obligation due. Owojori (2011) indicate that available statistics from liquidated banks show that inability to collect loans and advances given to customers related to managers was a major contribution to distress. Anila (2015) in his research paper on factors affecting performance of commercial banks in Albania banks size was used as one of the independent variable. Capital adequacy had a strong negative and significant relationship with performance of the banks. Other authors who got contradicting results where Capital adequacy had a positive relationship with performance (Frederic, 2014), similar findings by other previous research was by (Obamuy, 2013; Ongore & Kusa, 2013; Syafri, 2012).

Fan and Yijun (2014) researched on the Impact of Credit Risk Management on Profitability of Commercial Banks in Europe. The main aim of the study was to investigate effect of credit risk management and profitability of commercial banks in Europe performance was measured by ROE and ROA while NPLR and CAR are defined as proxies of credit risk management. 47 largest commercial banks in Europe were used for the period from 2007 to 2012. The findings reveal that credit risk management had positive effects on profitability of commercial banks. Between the two proxies of credit risk management, NPLR has a significant effect on performance while CAR has an

insignificant effect on performance. However, from 2007 to 2012, the relationships between all the proxies were not stable. The study recommends management should control the NPL. They should evaluate the bank ability to pay back when borrowing.

Muhammad (2012) researched on credit risk and performance of Nigerian banks for the years 2004 to 2008 found a negative relationship between credit risk and performance. Similar findings from other authors whose study on Australian State housing authorities found a negative relationship between credit risk and performance (Peter & Peter, 2006). Hamed, Sanaz and Hadi (2013) in their research on effects of credit risk indicator on share-holders value of commercial banks in Iran showed negative effects of capital adequacy and level of doubtful debts to total loans on share-holders value. Kolapo, Ayeni and Oke (2012) studied credit risk and commercial banks in Nigeria using panel model approach for a period of 11 years. In their research the proxies for credit risk had a positive correlation with performance. This finding concluded that Nigerian banks should enhance their capacity on credit analysis and on loan administration. Khizer, Muhammad and Shama (2011) in their research found the ratio of non-performing loans to total loans to be positive and significant to performance for Pakistan commercial banks. Abdullah (2013) in his research on banks in Nigeria for the years 2006 to 2010 showed that credit risk had a negative influence on performance this is in agreement with other authors like (Sacket & Shaffer, 2006).

Harison and Joseph (2012) in their research credit risk and profitability of selected rural banks in Ghana, the independent variables were capital adequacy and non-performing loans as proxies for credit risk and return on assets measured performance. Panel data was used for the period 2006 to 2010. The findings showed that non-performing loans had a positive and significant relationship to performance. Other authors found contradicting results for credit risk management and bank performance in Nigeria using panel data for 5 years from 2005 to 2009 the result showed negative correlation between non-performing loan ratio, loan loss provision, loan to deposit ratio on all measures of performance which were return on equity, return on assets and profit after tax (Oyewole, 2010). Similar results by other authors whose research on impact of credit

risk on banks' performance in Nigeria where a panel estimation of six banks from 2000 to 2013 was done using the random effect model framework and established a significant negative relationship between credit risk and bank profitability (Olawale, Tomola, Ayodele & Ademola, 2015). This implies that bank increased exposure to credit risk reduces profits.

Sujeewa (2015) in his research on Impact of credit risk management on performance for commercial banks in Sri Lanka, Primary data were collected from eight commercial banks out of 24 commercial banks mainly through an interview in order to have their views on the problems and solutions. The secondary data was also obtained from various sources such as Annual Reports of the selected commercial banks for panel data for the period 2009 to 2013. The Return on Assets (ROA) was used as performance indicator and Loan Provision to Non-Performing Loans (LP/NPL), Loan provision to Total (LP/TL), Non-Performing Loans/ Total Loans (NPL/TL) and Loan Provision to Total Assets (LP/TA) were used as indicators of credit risk. Regression model using E-views software was used to establish the relationship between credit risk and profitability. The result shows that non-performing loans and provisions had a significant negative relationship to profitability, thus credit risk had an adverse impact on the profitability. Ogboi and Unuafe (2013) researched on impact of credit risk management and capital adequacy on financial performance of commercial bank in Nigeria. The results showed that loan loss provision, adequacy ratio, and loan advances to deposit ratio showed a positive relationship with return on assets other researchers disagree with this findings where credit risk had significant negative impact on bank profitability in Nigeria (Ejoh, Okpa, & Egbe, 2014; Kargi, 2011)

Asad, Syed, Wasim and Rana (2014) form Pakistan banking sector researched on credit risk exposure and performance for five year period to 2010 using fixed effects regression analysis which showed loans and advances to deposit ratio and loan loss provision to non-performing loans had a significant negative relationship to performance. Similar studies have shown significant negative relationship between non-performing loans ratio and performance (Abdelrahim, 2013; Boahene, Dasah & Agyei, 2012) but inconsistent

to other authors whose results were Non-performing loans to Gross loans as proxies of credit risk had positive effects on the financial performance (Li & Zou, 2014). Aman and Zaman (2010) researched on impact of privatization on the credit risk and performance of Pakistan banks Using Error correction model and ensuring data stationarity, the findings were that capital adequacy ratio had statistical significant and positively related to performance of banks. Anila (2015) in his research paper on factors affecting performance of commercial banks in Albania banks size was used as one of the independent variable. Capital adequacy had a strong negative and significant relationship with performance of the banks. Other authors who got contradicting results where Capital adequacy had a positive relationship with performance (Frederic, 2014), similar findings by other previous research was by (Ongore & Kusa, 2013; Obamuy, 2013; & Syafri, 2012).

Rasika, Hewage and Thennakoon (2016) in their research does credit risk affect financial performance of Sri lankan commercial banks. In this research two state banks and four private domestic banks were used in this study, panel data for ten years period from 2005 to 2014 was analysed. Secondary data was collected from the published financial statements of the selected banks. The independent variable was credit risk which was measured by non-performing loans ratio and capital adequacy. The results showed that Capital Adequacy Ratio and Non-Performing Loan Ratio both have negative and significant relationship with Return on Equity. Sangare (2017) on the other hand researched on impact on credit risk and banks performance for member states of West African Economic and Monetary Union; twenty banks for a period of nine years were used. Natural logs of the variables were used to remove problem of large numbers hence heteroscedasticity. Random effects model was applied after Hausman test.

Non-performing loans ratio and loan loss provision as measures of credit risk had a negative significant relationship with return on assets a measure of performance. The study recommended that banks should review their lending policy and inject more cash flows so as to improve the credit risk management process. For this thesis using secondary data, Total loan to total deposit ratio (CR3), Capital adequacy (CR2), and Non-performing loan ratio (CR3) were used as measures of credit risk.

Taiwo,Ucheaga, Achugamonu, Adetiloye, Okoye, and Agwu (2017) undertook a research on Credit Risk Management: Implications on Bank Performance and Lending Growth on commercial banks in Nigeria's Deposit Money Banks over the period of 17 years (1998- 2014). The objective was to determine the effect of credit risk on performance of banks in Nigeria. The variable for this study were Interest Rate Spread, Money Supply, Loan to Deposit Ratio, Non-Performing Loan and Actual Liquidity Ratio Secondary data for the period was obtained from CBN Statistical bulletin 2014 and World Bank Index 2015. Multiple linear regressions were used to analyze the time series data. Ordinary Least Square and multiple regressions were used to determine the effect of credit risk on performance. Using the t-stat values, we found that just two independent variables are statistically significant at 5% level of significance. Money supply is statistically significant at 5% level of significance. The findings show that sound credit management strategies are very vital for investors' confidence in banking industry. Non-performing loans had positive relationship to lending growth. This shows that depositors do not evaluate the effectiveness of credit risk management before placing deposits in the banks. Interest rate spread had negative relationship to total loans and advances this showed that savers reluctance to make deposits when interest rate is low while banks at the same time have difficulty to in finding customers.

The study recommended adherence to credit risk strategies, appraisals and analysis. The credit worthiness of would be borrowers should be evaluated. Loan to deposit ratio and Money supply had great influence on bank lending growth. Total loans and advances had insignificant relationship to credit risk. The study recommended that banks should be encouraged to source for capital internally from profits other than external borrowings and liabilities.

According to Gakure, Ngugi, Ndwiga and Waithaka (2012) whose research on effects of credit risk management techniques on banks' performance of unsecured loans in Kenya found that credit risk had a negative relationship to performance this resulted to imposition of constraints on bank's ability to meet its business obligation when due. Tarus, Chekol and Mutwol (2012) in their research on Kenyan banks for five year period to 2009 found a positive relationship between credit risk and performance which was similar to other authors work whose study on the impact of Credit Risk Management on Profitability of Commercial Banks in Europe data was collected from the largest 47 commercial banks for the period 2007 to 2012. The findings were credit risk management measured by Non-performing loans ratio showed positive and significant effect on profitability of commercial banks in Europe (Li & Zou, 2014). Imamul and Arif (2015) in their research on relevance of financial risk with financial performance an insight of Indian Banking Sector The financial data were collected from the annual reports of the selected commercial banks and annual reports from the banks websites. The research covered a five year period. This research utilized selected ten leading banks, five from public sector and five from private sector, as representatives on the basis of total assets though the results were Credit Risk was positive and significant to the financial performance of India Commercial.

2.4.2 Interest Rate Risk

The Bank's interest rate risk arises from interest bearing investments, loans and advances to commercial banks and investments by banks (CBK, 2016). Interest rate risk management comprises actions, policies, and techniques that a bank uses to minimize

the risk of reduction of its net equity due to adverse changes in interest rates. Interest rate risk factors have adverse effects on bank‘s earning and its economic position which are estimated in each currency that banks have interest-rate-sensitive securities and off-balance sheet positions (Opoku-Adarkwa, 2011). It is the potential for changes in interest rates that reduces bank‘s earnings. An investor may lose potential return if interest rates rise after committing to particular interest rate. When interest rates change it affects the value of the instrument (BCBS, 2000).

Banks encounter interest rate risk in different ways including re-pricing risk which is the primary and most common form of interest rate risk that arise from timing differences in the maturity of banking corporation assets and liabilities (BCBS, 2000). The yield curve may likely shift due to changes in relationships between interest rates for different maturities of the same index. Differences in interest rate changes gives rise to unexpected changes in the earnings spread between assets and liabilities of similar maturities (Kolopo & Dapo, 2015).

Khawaja and Musleh (2007) in their research found out that increase in interest rate depress borrowers and depositors but increases performance. Thus when banks charge high interest rate they gain high return from borrower and at the same time discourage depositors by giving them low returns as they have no options but to accept the prevailing rate given by the bank. Other authors whose findings were similar used five major commercial banks in Pakistan, panel data for four years 2008 to 2012 and the findings showed a significant negative correlation between interest rate risk and performance (Waseem & Abdul, 2014).

Zairy and Salina (2010) in their research paper on analysis of Islamic banks exposures to rate of return and risk the panel data for 2007-2008 the study found that Islamic banks showed strong positive correlation between rate of return risk and performance. Kolopo and Dapo (2015) on the other hand in their research for the period 2002 to 2011 in Nigeria a sample of tier one capital banks, using fixed effects regression interest rate risk had insignificant effect on banks performance.

Zagonov, Kiswani and Mash (2009) in their study determining how banks regulate the interest rate risk, the findings were performance was negatively correlated to interest rate risk this was explained by the fact that management failed to hedge the risk similar results by (Matthias, 2012) on impact of loan growth and business model on bank risk in 15 EU countries found higher level of interest rates reduce bank's exposure to leverage risk. For this thesis using secondary data the following were used to measure interest rate risk loans to total asset ratio (IR1) and interest income to total assets (IR2)

2.4.3 Liquidity Risk

Liquidity risk management entails maintenance of sufficient cash, marketable securities, and availability of funding for committed credit facilities (CBK, 2016). BCBS (2008) asserts that fundamental role of banks in the transformation of short-term deposits into long-term loans makes banks vulnerable to liquidity risk. A liquidity shortfall at a single bank can have system-wide repercussions. The global sub-prime crisis of 2007 to 2008 emphasized the importance of liquidity management in banking sector. The Basel Committee issued its "Principles for Sound Liquidity Management and Supervision which gave two concepts of liquidity, funding liquidity and market liquidity. Funding liquidity refers to the ease which an organisation can attract funding. Market liquidity is high if it's easy for an organisation to raise funds by selling an asset, other than borrowing against it as collateral. Liquidity becomes a risk factor if the magnitude of impact changes randomly over time (Clemens, Iman & Robert, 2015).

Liu (2011) put forward various methods to measure liquidity risk including cash in hand to asset ratio, liquidity ratio, borrowing fund-asset ratio, borrowing fund-deposit ratio, cash reserve ratio, deposit-credit ratio, lending fund-deposit ratio, and debt paying ability. Norazwa, Mohamad, and Hawati (2015) in their research on Liquidity Risk and Performance, The Case of Bahrain and Malaysian Banks. panel data for the period 2008 to 2014 was used the measures of liquidity risk were change in current ratio, growth of total asset loan volatility, bank capitalization, deposit volatility, loan to deposit ratio, management efficiency, interbank ratio and bank size. The result showed that deposit

volatility, bank capitalization, growth of total asset loan volatility, management efficiency, size of bank and loan to deposit ratio are important to liquidity risk. Deposit volatility and liquidity risk had a significant negative relationship for banks in Bahrain only thus higher volatility on deposit leads to a lower liquidity hence increases liquidity risk exposure. Result also found that coefficient of bank capitalization had a positive and significant relationship with the liquidity risk for all banks.

Bessis (2010) considers liquidity risk from three perspectives. The first one is considered where the bank cannot raise funds at a reasonable cost due to conditions related to level of interest rates, transaction volumes, and difficulties in funding counterparty. The second perspective looks at liquidity as a safety cushion that helps to gain under difficult situations. Thus liquidity risk is a situation where there is mismatch and short term assets are inadequate to pay for short time liabilities. The final perspective is where liquidity risk is considered as the extreme situation. Such situations arise if there is a large loss creating liquidity issues. Large-scale withdrawal of deposits can cause liquidity risk in the banking sector but it may not be a major source of liquidity risk. Other factors that may lead to liquidity risk include large commitments or having a large exposure in long-term lending thus they may face liquidity problems (Ahmed & Anees, 2012).

BCBS (2008) published principles of sound liquidity risk management and supervision where fundamental principles for the management and supervision of liquidity risk were highlighted. Thus banks should have risk management framework that ensures availability of liquidity assets sufficient to survive stress environment (Kim, 2015). The principles recommends that banks should identify, monitor, measure and control potential cash flows related to off balance sheet commitments and contingent liability as most banks lend and underestimate the liquidity risk. Abdulla, Atheer and Delan (2017) posits that a requirement for effective liquidity management is to have both strong internal and external controls systems over daily operations, it calls for having contingency plans in place in case they face liquidity.

Sufian and kamarudin (2011) examined the determinants of Bangladesh banking sector profitability, where bank-specific and macroeconomic determinants were evaluated. The research findings revealed that liquidity levels significantly affect the bank's profitability this is consistent with (Dang, 2011) who found that adequate level of liquidity is positively related with bank profitability. Other authors found contradicting findings where the relationship between liquidity risk and bank profitability in Kenya was insignificant (Ongore & Kusa, 2013).

Kim (2015) investigated the impact of liquidity risk on banks performance in European Union countries panel data for the three year period to 2009 and sample data from 23 European Union countries was used. The findings were a negative relationship between liquidity ratios and performance. On the hand other authors in their research on liquidity risk and performance in EU countries found the ratio of loans to deposits as a proxy for liquidity risk significant and positively related to net interest margins (Chortareas, Girardone & Ventouri, 2011). Umar, Muhammad, Asad and Mazhar (2015) in their study on impact of liquidity risk management on firms' performance in the conventional banking of Pakistan. Two banks were used in the study for the period 2009 to 2013 the results indicated that current ratio was negative and significant to performance. Similar studies have shown significant negative correlation between current ratio as a proxy of liquidity risk and performance (Naceur & Kandil, 2009; Pasiouras & Kasmidou, 2007).

Arif and Anees (2012) undertook a research on liquidity risk and its effects on banks profitability in Pakistan. The research found that there existed significant negative relationship between liquidity, deferred loans, liquidity gap with performance. In a similar research done by (Ahmed & Ahmed, 2012) where 22 banks in Pakistan were used for the period 2004 to 2009. The findings were bank deposit and cash had a significant positive relationship to performance while non-performing loans ratio had a negative relationship to performance similarly (Chen, Shen & Kao, 2010) studied the pattern of liquidity risk of bank on performance for commercial banks in 12 advanced economic countries for the years 1994-2006 and found that liquidity risk was a determinant of bank performance. Alper and Anbar (2011) examined special and

macroeconomic determinants of Turkey's bank for the years 2002-2010 using panel data and found that liquidity had positive effects on the bank's performance, similar results from research by other authors based on 15 banks of Iran during the years 2003 to 2010, liquidity risk had a significant negative effect on performance (Naser, Mohammad & Ma'someh, 2013).

Nora and Maytham (2015) in their research on empirical analysis of iquidity Risk and Performance in Malaysia Banks, in these research 21 commercial banks in Malaysia were studied for the period of 2005-2013. Panel data for this period was utilized in this research. The independent variables were loan to deposit ratio, liquid assets to total assets ratio and capital to asset ratio the dependent variable was performance measured by return on assets and return on equity. The results of loan to deposit ratio showed insignificant relationship with measures of bank performance. As for liquid assets to total asset ratio and capital ratio, both liquidity risk indicators had a significant relationship with measures of banks performance. The negative result of liquid asset to total asset implies inverse relationship thus disadvantage of banks holding higher liquid assets. For capital ratio, the mixed results, which is positive significant effects with return on assets and negative with return on equity cause the effects on performance not to be inferred. The authors concluded that measures of liquidity risk may differ due to many factors like bank regulations and policy that may influence the way they handle the effects of liquidity risk recommending further research to clarify the relationship

Maaka (2013) in his unpublished thesis on relationship between liquidity risk and financial performances of commercial banks in Kenya panel data for 33 Kenyan banks for the period 2008 to 2012 was used, the results were Liquidity gap and leverage had significant negative results to performance. In a similar research done in Kenya by other author where 43 commercial banks were used for the period 2010 to 2013 the findings were asset quality and banks to total Assets as proxies of liquidity were negatively correlated to performance and significant (Mwangi, 2014).

Muriithi, and Waweru, (2017) The study examined the effect of liquidity risk on financial performance of commercial banks in Kenya for the period 2005 and 2014 for all the 43 registered commercial banks in Kenya. The independent variables proxies for liquidity risk included liquidity coverage ratio and net stable funding ratio and dependent variable for performance was return on equity (ROE). Data was collected from commercial banks website and Central Bank of Kenya. Panel data techniques of random effects estimation and generalized method of moments were used. Findings were net stable funding ratio is negatively associated with bank profitability both in long run and short run while liquidity coverage ratio was not significantly for commercial banks in Kenya both in long run and short run. liquidity risk had a negative effect on financial performance thus bank's management should pay attention to the liquidity management. For this thesis using secondary data the following were used to measure Liquidity risk, liquid assets to total assets (LQ1) and total assets to total deposits (LQ2).

2.4.4 Foreign Exchange Risk

Foreign exchange risk relates to the effect of an expected exchange rate changes on the value of the firm. Foreign exchange risk is direct and the indirect loss on the firms' cash flows, assets, and liabilities due to unexpected exchange rate (Michael, 2006). Financial firms are exposed to three exchange rate risks which are, transaction risk which is a cash flow risk on exchange rate movement on transaction accounts exposure of the firm, Translation risk is the second type that relate to balance sheet exchange rate risk that relate to the valuation and consolidation of assets and liabilities of foreign branch for balance sheet items depending on accounting regulations which involves long term exposure in balance sheet items. The third risk is economic risk that shows the firms present value of future operating cash flows due exchange rate movement (Ding & Ou, 2012).

Vincent and Paul (2001) in their research whether foreign exchange matter for industry stock returns, weekly panel data for seven industries in European countries over the years 1990 to 1998 were used. Their findings were that exchange rates had significant positive effect on expected industry returns and on their volatility. James, Ted and Sorin (2011) researched on foreign exchange risk and the cross section of US returns during the period 1973 to 2002 it was shown that firms with extreme absolute sensitivity to foreign exchange have low required rate of return than other stocks. The market price of foreign exchange risk was found to have negative relationship with stock returns. Different results from similar research by another author on foreign exchange volatility and stock returns where a full sample of 34 European countries whose daily exchange rate for the period 1973 to 2010 was evident that foreign exchange volatility does not improve performance of the model (Ding, 2012).

Gino Lucio and Ilias (2014) researched on foreign exchange risk and their predictability of carry trade returns found a negative predictive relationship between risk and realized returns. Other authors who had a similar findings posited that foreign loans to total assets as proxy for foreign exchange risk was negative to earnings for US large commercial firms (Ling, Alex & Micheal, 2014). Xiangnan, and Xin (2012) their research foreign exchange sensitivity of china bank stock returns, their research employed generalised autoregressive conditional heteroskedasticity (GARACH) model to investigate effects of foreign exchange of 14 listed Chinese banks in shanghai and Shenzhen stock exchange. The daily percentage change for foreign exchange were used, the daily mean return for the period 2007 to 2010 foreign exchange risk was negatively correlated to returns.

Razvan and Ramona (2013) explored the influence of foreign exchange rate variations on the returns and volatility of stock return markets from Romanian capital market for the period 2000 to 2012. The period was split into four sub samples which corresponded to Romanian financial markets evolution stages. From 2000 to 2007 there was no evidence on foreign markets influence. This period was characterized by Romanian adhesion to European Union. For the period 2008 to 2010 there was a positive and

significant relationship between foreign exchange and stock returns only. This shows that this relationship depended on other factors like foreign capital inflows, global crisis and the perception of national economy. For this thesis using secondary data standard deviation of foreign exchange rate (FXR) was used to measure foreign exchange risk.

2.4.5 Market Risk

Market risk occurs when an entity experiences loss from unfavorable movements in market prices resulting from changes in prices of fixed-income instruments, commodities, equity instruments, off-balance-sheet contracts, and currencies (Hannie & Sonja, 2009). Market risk is the loss arising from adverse changes in market rates and prices such as commodity prices and equity prices (Othman & Ameer, 2009). The Basel Committee on Banking Supervision show that provision of information on common risk metrics to market participants is a fundamental to sound banking system. It reduces information asymmetry and helps promote comparability of banks risk profiles (BCBS, 2015). It's important as actions of shareholders, creditors, and other market participants of banks influence risk-taking decisions of bank managers (Beverly, 2015).

Markowitz portfolio risk under Markowitz portfolio theory introduced value at risk (VAR) which was shift in measures of risk thus use of derivatives in the market is part of market risk management which has the advantage of summarizing banks' exposure to several risks (Othman & Ameer, 2009). The parameters used in determination of VaR include time horizon which depends on maturity of a portfolio. For a more accurate measurement of established bench mark recommends use of short time horizon but for banks capital adequacy in relation to market exposure to risk its recommended to use longer interval (Ioan, 2009) confidence probability reflects the banks aversion to capital cost that will exceed VaR. Morgan in 1994 developed VAR for estimating expected loss for a fixed portfolio at a time t and probability value p measuring total risk of a portfolio using a single number (Bessis, 2010). This has gained a wide spread use in risk measurement after financial crisis of 2008 and was commonly used to measure market risk (Piroozfar, 2009).

In Basel II Capital Framework is represented by three pillars Pillar I, which defines the minimum regulatory capital requirement that is based on principles which measures credit, market and operational risks; Pillar II, designs the bank's supervisory review process and Pillar III, deals with disclosure requirements that makes market participants to have a good knowledge of all banking risks that is market discipline (Sovan, 2009). Market risk measurement has been improved using various statistical approaches. VAR Monte Carlo simulation a method of simulating a random process representing a portfolio after sufficient simulation; one is able to obtain loss distribution hence extracting VAR for different probabilities as done for historical simulation (Sufian & Kamarudin, 2012).VAR variance covariance method has two assumptions the first one is that the portfolio is linear thus change in portfolio price is linearly dependent on its constituent asset price. The second is assets have joint normal return distribution. This guarantee the portfolio return and portfolio loss is assumed to be normal (Julijana, 2013).

Pariyada (2013) researched on sensitivity of stock returns for Thai commercial banks the research employed GARCH approach. The results were that market risk was a major component in sensitivity of bank stock returns the relationship was positive and significant. Large banks are more sensitive to changes in market conditions than medium and small banks. Banks with high market power have higher profitability and banks with low market power will have low profitability. For this thesis using secondary data, value at risk (MR) was used to measure market risk.

For this study value at risk (VAR) was used as a measure of market risk. According to Jorion (2001) VAR summarizes the worst loss over a target horizon at a given level of confidence. When estimating market risk the standard internal modes for determining VaR must meet certain conditions including daily valuations of market and currency risk (BCBS, 2006). To determine VaR the parameters to be set include Time horizon for the risk (t) which depends on the risk factors and maturity of portfolio positions. It is recommended the calculation of VaR on a short time horizon but for bank capital adequacy in relation to market risk exposure, it is recommended to use a longer interval

thus use of historical observation of at least one year and recognition of correlations between major categories of risk. Confidence probability (α) should reflect the bank's aversion towards the capital cost that will exceed VaR and it is recommended that it be maintained within the margin of 99% (Trenca, 2009). The study used 99 % confidence level hence VaR was calculated as shown in equation 2.1

$$VaR = -Vf\ \alpha\ SD \qquad (2.1)$$

Where: Vf is the initial value (in shillings) of the profits, α is the confidence level taken at 99% which is 2.33 it's the constant that gives one-tailed confidence interval for standardised normal distribution. SD is the standard deviation of the profits. The advantage of variance covariance model is that it allows for a quick calculation, its disadvantage is that restrictive assumptions of a normal distribution of returns. However that the normality assumption could be relaxed (Micheal, 2006). Higher VAR suggest that banks address a bigger problem in risk exposure (Eduardus, 2007).

2.4.6 Banks Size

From past researches evidence on influence of bank size on profitability is not conclusive. Whereas Goddard, and Molyneux and Wilson (2004) and Borio and Zhu (2015) in their separate researches finds a positive influence of bank size on performance. This is supported by other authors like (Shehzad, De Haan, & Scholtens, 2013) who found that larger banks are more profitable when compared to small banks, but they grow at a slow pace. Though larger banks can benefit from the economies of scale but smaller banks will grow faster at expense of profitability. ECB (2015) in their research on Europe banks found that bank size had a significantly negative effect on profitability this could be explained by the more costly and complex structure of larger banks. On the other hand, Athanasoglou, Brissimis and Delis (2008) and Trujillo-Ponce (2013) found contradicting results where the relationship between bank size and performance was insignificant and they suggested a non-linear relationship where profitability initially increased with size then there after declined.

According to Shim (2013) large banks tend to be diversified when managing capital assets they tend to have easier access to capital markets compared to smaller banks. This shows that small banks are more prone to bank failure than large banks. Li (2013) noted that large banks find themselves prone to risky lending activities which lead to large losses hence failure. The existing literatures show that firm size is positively correlated with financial performance thus in particular, larger firms may attract greater risk, and therefore size may affect performance (DeNicolo, 2000). Cheung, Thomas, Limpaphayom, and Zhou (2007) indicate that larger firms tend to have lower firm performance measures such as ROA.

Lepetit, Nys, Rous, and Tarazi (2008) studied the impact of non- interest revenue on risk structure of banks, a sample listed and non- listed banks in European countries for period 1996 to 2002. The research found small banks were risky when they compare their operating income with trading activities, while larger banks were less risk. This was similar to another author who found a significant positive relationship between bank size and profitability for banks in the U.S., Japan and several European countries (DeNicolo, 2000). Other authors have had contradicting results on research on Germany banks where bank size had a negative relationship with bank stability for private banks (Thorsten, Heiko, Thomas & Natalja, 2009).

Sameti, Dalali, Rahim, Karnameh and Hassan (2011) researched on impact of macroeconomic instability on lending behaviours of commercial banks in Iran, for the period of 1974-2008. Based on method of cointegration and vector error correction model, bank size had a significant positive relationship with performance. In a similar research other authors on comparative study on the financial performance between convention and Islamic banks in Egypt found that bank size had an insignificant positive relation with performance which showed that size of a bank does not influence profitability levels (Amr & Osama, 2015).

Katuku and Dzingirai (2014) in their research on determinants' of Bank Failures in Multiple- Currency Regime in Zimbabwe, Banks size has significant and negatively correlation to possibility of failure thus when the size of the bank increase, probability of failure is reduced, Descriptive statistics showed that most of the failed banks were of small size, this is due to the fact that large banks hold more assets and can diversify reducing risks, this contradicts research by other authors where bank size was used as a moderating variable, the research focused on financial risk for Islamic banks and profitability. Banks size measured as natural logarithm of total assets had a positive effect on profitability (Anas & Fauziah, 2014). Olusanmi , uwuigbe and uwuigbe (2013) in their research effects of risk management on banks financial performance in Nigeria banks Size of the bank measured as natural logarithm of assets the findings showed no moderating effect on performance.

Adilya and Burulcha (2015) in their research on financial performance of commercial banks in Krygyz republic in Central Asia, the findings showed that the log of assets as a moderating variable had a negative coefficient which was significant this showed that as assets of banks increase profitability of the banks decrease. In summary size of the bank has received great focus on many performance studies several authors found bank size having positive relationship to performance (Gyamera & Amoah, 2015; Tariq, Usman, Mir, Aman, & Ali, 2014; Ayele, 2012; Swarnapaha, 2014). Other studies found contradicting results where the relationship was negative (Amare, 2012). This research is different from previous researches as bank size has been taken as a control variable. For this thesis using secondary data, natural logarithm of total assets was used to measure Bank size (TA).

Anila (2015) in his research paper on factors affecting performance of commercial banks in Albania banks size was used as one of the independent variable. The results showed that banks size had a positive but not significant relationship with performance measured by return on assets. This showed that the size of the bank does not have a very strong impact on profitability thus could not conclude that larger banks can achieve a higher return on assets. Similar findings were obtained other authors (Frederic, 2014). Other

authors found contradicting findings which found a significant positive relation of size with ROA (Gul, Faiza, & Khalid, 2011).

2.4.7 Performance of Commercial Banks

This research adopted approach of Naïmy (2011) to determine performance indicators; hence, return on assets (ROA) and return on equity (ROE) were adopted as performance measures. Return on assets is regarded as having prominence for accounting performance measure and it is a critical element of loan quality when determining bank performance. Return on equity measures performance from shareholders perspective, thus measure accounting profit per shilling of book value of equity capital, which is determined by dividing net income by total equity. This can be broken down into equity multiplier (EM) and return on assets (Ofosu-Hene & Amoh 2015). Therefore: ROE is equal to ROA times equity multiplier EM*;* EM is total assets / total equity. The main objective of commercial bank is profitability thus all strategies employed by commercial banks will target at achieving this objectives though depending on the perception of the managers, commercial banks may have other social and economic objectives (Khrawish, 2011). The major profitability indicators include Return on equity (ROE), Return on assets (ROA), and net interest margin (NIM).

Return on assets reflects the ability of banks management to generate profits from assets the ratio may be biased due to off balance sheet activities. Return on equity on the other hand show return on shareholders' equity this show return on assets time's total assets to equity ratio. Banks with higher equity will report a higher ROA but will have lower ROE. Return on equity measures leverage and it tend to disregards the greater risk associated with higher leverage (Gul *et al.*, 2011). Net interest margin measures the difference between interest income received by banks from its activities and the interest paid out by banks to the lenders relative to the assets of the banks (Mwangi, 2014).

A profitable banking sector can withstand negative shocks hence contributing to stability of financial system. Changes in the operating environment particularly credit risk is likely to affect bank performance. Empirical analysis shows that both bank-specific and as macroeconomic factors are major determinants of profitability of banks (Ross, Westerfield, Jordan & Jaffe, 2007). For this thesis using secondary data Return on assets (ROA) and Return on equity (ROE) were used to measure performance.

2.5 Empirical Review

According to Devinaga (2010) commercial banks are required by regulators to hold a certain level of liquidity assets. This is to ensure they possess enough liquidity so as to deal with bank runs and has an effect on the banks' ability to raise finance. Olusanmi, uwuigbe and uwuigbe (2013) in their research effects of risk management on banks financial performance in Nigeria banks, their study considered 14 banks listed on the Nigeria security exchange for the period 2006-2012. The independent variables were non-performing loans ratio, capital ratio, loan to total deposit ratio, risk disclosure. The dependent variables to measure performance were return on equity and return on assets. The study used regression analysis and the findings were non-performing loan and loans to deposit as a measure of credit risk had no significant influence on performance though the relationship is negative. Size of the bank measured as natural logarithm of assets as a moderating variable had no moderating effect on performance of the bank in Nigeria. The research found that management of risk does not often translate to positive financial performance though management reduces the occurrence of systematic risk.

Hoseininassab, Yavari, Mehregan, and Khoshsim (2013) in their research on effects of risk parameters (Credit, Operational, Liquidity and Market Risk) on Banking System Efficiency, in this research 15 top banks in Iran were used over six year period from 2005 to 2011. The independent variables were liquidity risk, operational risk, credit risk and market risk. The research used efficiency of banks as a measure of performance. Panel data for the six year period was applied. Three indicators for credit risk thus granted facility to asset ratio, capital adequacy and differed demand to facilities ratio

were used. The results were granted facility to asset ratio and capital adequacy had a positive and significant relationship to performance measures. While differed demand to facilities ratio had a negative and significant relationship to performance. Operational risk was measured by return on assets volatility, stock return volatility, and stock holders' equity. The results showed that stock holders equity showed a positive and significant relationship with performance while return on assets volatility and stock return volatility had a positive and significant relationship with performance. The measures of market risk were change in interest rate and change in exchange rate. Change in interest rate had a negative and significant relationship to performance while change in exchange rate had a positive and significant relationship to performance. Three indicators were used to measure liquidity risk, they included facility to deposit ratio, long term facility to long term deposit ratio and cash to deposit ratio. The results showed that facility to deposit ratio and long term facility to long term deposit ratio had a negative and significant relationship to performance while cash to deposit ratio the relationship was positive and significant. The authors recommended further research to determine the impact of exchange rate risk and other risks on banks efficiency using more input and output in measuring banks efficiency.

Noor and, Abdalla (2017) researched on the Impact of Financial Risks on the Firms' Performance of firms in Kenya, the objectives of the study were to find out how credit risk affect firms' performance , To find out how liquidity risk affect firm's performance, Determine the effects of market risk to firm's performance To analyze the how foreign exchange rate risk affect firm's performance. The findings were there was a significant relationship between the variables of risk and financial performance. The research concluded that Financial Risks had greater impact on performance of Firms. Thus the research found that Credit Risk affected lending and borrowing by Financial Firms, Foreign exchange risks makes firms realize unpredictable losses this affect performance.

Ali (2015) researched on effect of credit risk on management on financial performance of the Jordan commercial banks. Thirteen commercial banks were chosen to express on the whole Jordanian commercial banks. Credit risk indicators used in the research were capital adequacy, non-performing loan to gross loans, credit interest to credit facilities, and leverage ratio. Performance was measured by return on assets and return on equity. In this research stationarity were tested using Augumented Dickey fuller test on the first difference the results indicated rejection of unit root null hypothesis of stationarity. In the first model using return on assets (ROA), non-performing loans ratio had a positive relationship ROA while Leverage ratio and Provision for Facilities loss to Net facilities ratio had negative effect on banks financial performance. Capital adequacy ratio, Credit interest to Credit facilities ratio and the leverage ratio had no effect on banks financial performance. The second model where return on equity ROE was used Non-performing loans to Gross loans ratio had positive effect on the banks financial performance. Leverage ratio and Provision for Facilities loss to Net facilities ratio had negative effect while Capital adequacy ratio, Credit interest to Credit facilities ratio and the leverage ratio had no effect on the banks financial performance.

Anas and Fauziah (2014) researched on impact on financial risk on Islamic banks in Malaysia. Performance was measured by return on assets, independent variables were credit risk, liquidity risk and rate of return risk, the research was controlled by GDP , inflation rate and bank size. Sixty five global Islamic banks for a period of eight years from 2004 -2011 were used in the study. Panel data were used and panel unit root test was applied where fisher type (ADF) unit root was used. All variables were stationary except inflation which after first difference it became stationary. The findings were that credit risk and rate of return risk had a significant negative relationship. Liquidity risk had positive relationship with (ROA) but not significant, hence not regarded as absolute determinant of fully fledged Islamic bank profitability. Control effects of size of bank and GDP was negative and positively related to ROA respectively but not significant.

Hussein, Hela and Walaa (2015) undertook a research on financial risk and Islamic banks performance in the Gulf cooperation council (GCC). The independent variables were liquidity risk measured by total loans to total deposit ratio, credit risk measured by total loans to total assets ratio, capital risk measured by equity capital to total assets ratio and operation risk measured by cost to income ratio. The dependent variable was return on equity. Gross domestic product was taken as control variable. Eleven banks from the total forty seven banks were chosen for the period 2000 to 2012 of which three banks were from Kuwait, two from Bahrain, three from UAE one from Qatar and one from Saudi Arabia. The findings from the regression model showed that capital risk and operation risk had a negative and significant relationship to return on equity while credit risk and liquidity risk had an insignificant relationship to return on equity. Gross domestic product had no control effects on the model. The study recommended that more emphasis should be taken on mitigating capital and operation risk to improve performance.

Adeusi, Akeke, Obawale and Oladunjoye (2012) in their research risk management and financial performance of banks in Nigeria. Secondary data was from annual reports for 4 years and financial statements of 10 banks were used in this research panel data estimation technique was adopted. The results showed that there was a significant relationship between bank performance and risk management. Better risk management in terms of managed fund, reduction in cost of bad and doubt loans and debt equity ratio resulted in better bank performance. Thus, it is of crucial importance that banks practice prudent risk management and safeguarding the assets of the banks and protect the investors' interests. Umar, Muhammad, Asad, Muhammad and Mazhar (2015) in their study to analyze impact of bank liquidity risk on performance of Conventional banks in Pakistan. A sample of 10 banks from banking sector in Pakistan was used.

The independent variables were current ratio and loan to deposit ratio while the dependent variable were return on assets and return on liabilities. The findings were that both current ratio and loan to deposit ratio had a positive relationship with both return on assets and return on liabilities which were significant for Pakistan banks. In this research as liquidity risk increase the performance of Pakistan banks increase.

Hansen (2009) conducted a study on the strategic foreign exchange risk management practice by Danish medium-sized non-financial, not-listed companies that are involved in international activities. The study showed that foreign exchange risk had a positive correlation to financial performance. The size of the company had a significance positive relationship with performance. Ahmed, Akhtar and Usman (2011) conducted a study on risk management practices and Islamic Banks. The research aimed at determining the firm's level factors which have significantly influenced the risk management practices of Islamic banks in Pakistan. The study concluded that size of Islamic banks had a positive and statistically significant relationship with financial risks that is both credit and liquidity risk.

Imamul and Arif (2015) in their research on relevance of financial risk with financial performance an insight of Indian Banking Sector , the objectives of the research were To assess the relationship between credit risk and financial performance of Commercial banks in India and to measure the impact of liquidity risks financial performance of commercial banks in India, to measure the impact of interest rate risks financial performance of commercial banks in India to measure the impact of capital risks financial performance of commercial banks in India and to measure the impact of solvency risks financial performance of commercial banks in India. The financial data were collected from the annual reports of the selected commercial banks and annual reports from the banks websites. The research covered a period 2008 to 2012 thus five year period. This research utilized selected ten leading banks, five from public sector and five from private sector, as representatives on the basis of total assets. The analysis of the study showed Interest Rate Risk and Liquidity Risk were insignificant to performance whereas Solvency Risk Capital Risk and Credit Risk were statistically

significant to the financial performance of India Commercial Banks. The study recommended that banks should revamp the conventional risk management system, and should have adequate capital and develop the regulatory insights to avoid the legal or compliance risks also to adopt the proactive approaches when handling financial risks.

Virginie (2015) this research investigated the effects of capital and liquidity ratios on banks' profitability according to their size. The data used was obtained from Bank scope, a regular financial database of Dijk desk. The sample included annual financial data of 1270 European banks for the period of 2005 to 2012. The banks were put into three groups of 346 commercial banks, 487 cooperative banks and 835 savings banks respectively. The independent variables were bank capital, liquidity risk and credit risk. The findings were Liquidity risk had a positively relationship to performance which was significant for small banks. This meant that on average small banks had less demand deposits in comparison to large banks though large banks had better access to external funds than small banks. Credit risk showed a negative relation to banks profitability this was significant for large banks. Thus total loans had an association with decreased in profitability for large bank thus higher provisions indicates non-performing ratios with lower asset quality.

Şerife and Ugur (2012) researched on impact of macroeconomic variables on stock returns for companies from different sectors in Bosnia and Hezegovina. Forty five companies from 11 sectors were chosen in order to observe the role of each macroeconomic factor on stock returns. The following factors were used inflation rate, exchange rate, interest rate, unemployment rate and current account deficit The overall results indicated that exchange rate and interest rate were the most significant factors which influenced stock price fluctuations of the companies. Stock returns for companies in various industries were very sensitive to the changes in interest rate and exchange rate.

Aykut (2016) researched on the effect of credit, interest and foreign exchange rate risk on the bank index and bank stock returns. For this there were 49 banks in total, 32 of them being deposit, 13 development and investment and 4 of them participation banks. The descriptive statistics for the variables was done. The return distribution was negatively skewed for all variables. Negative skewness meant asymmetrical distribution with a long tail to the left meaning big losses in the crisis periods. All data had large kurtosis values this indicated leptokurtic distribution which is more peaked around the mean than a Gaussian distribution. The normality was rejected at 1% significance level by Jargue- Bera tests. Augmented Dickey-Fuller statistics indicated stationary condition by rejecting the unit root at 1% and 5% significance levels. The results showed interest rate risk had a statistically negative and significant effect on the volatility of bank profitability. The effect of Foreign exchange risk on bank return volatility was significant and positive Credit risk had a negative and significant effect on bank index and bank returns volatility. This result supports the fact that the Turkish banking system had a large short position till the end of 2002 and small and long position after that time.

Ofosu- Hene and Amoh, (2016) in their research on risk management and performance of listed banks in Ghana, Secondary data of all listed banks on Ghana Stock Exchange over the period 2007–2014 was used. Panel regression data approach and a risk index were constructed for all listed banks on Ghana Stock Exchange. For this research the variables were risk index, bank size, capital adequacy, liquidity risk, credit risk, inflation, exchange rate risk. The dependent variables were return on assets (ROA) and return on equity (ROE). The banking industry in Ghana had 32 registered banks (Bank of Ghana, 2016). Seven were listed on the Ghana Stock Exchange (GSE), were selected. Banks that had been on the stock market for 10 years Data covering the period 2007–2014 was used in the analysis a sample of 20 banks being used and secondary data based on audited annual accounts submitted to Bank of Ghana and banks website. Other data were sought from databases of Ghana Statistical service.

The findings were risk management (RI) had no significant relationship with return on assets a measure of bank performance. Bank size and capital adequacy had no significant relationship with bank performance (return on assets). There was a significant relationship between credit risk measured by nonperforming loans and return on assets. Liquidity risk had significant negative relationship with return on assets.

The results when using return on equity were as follows, risk management (RI) had a significant positive relationship between return on equity (ROE) this suggested that there is little impact on performance due to very small coefficient. Bank size had no significant impact on return on equity (ROE) this was consistent with findings when return on assets (ROA) was used. This showed that whether equity is increased or not, it had not impact on either return on assets (ROA) or return on equity (ROE). Macroeconomic variables such as inflation and exchange rate risk also had no significant impact on return on equity (ROE) or return on assets. Capital adequacy had a significant negative effect on return on equity (ROE). Non-performing loans had a significant negative relationship with return on equity (ROE) The implication is that, as banks non-performing loans increases, it decreases their profit. The authors recommend that the Ghanaian banking regulatory management may need a rethink and be cautious during establishment of risk management policies and frameworks that ensures careful use of deposits improve bank performance.

In Kenya a study by Wanjohi, Wanjohi & Ndambiri (2017) analyzed the effect of financial risk management on the financial performance of commercial banks in Kenya. The objective was to establish the effect of financial risk management on the financial performance of the commercial banks in Kenya for five years (2008-2012). Primary data was used in this research where, a self- administered survey questionnaire was used across the banks. The study used multiple regression analysis was used risk measurement risk management environment, risk monitoring and adequate internal control had a positive correlation to the financial performance of commercial banks in Kenya. This research concluded that financial risk had a strong impact on the financial performance of commercial banks in Kenya.

Kamau, and Njeru, (2016) researched on Effect of Liquidity Risk on Financial Performance of Insurance Companies Listed at the Nairobi Securities Exchange the objectives of the study were effect of operational risk on financial performance of insurance companies listed in the Nairobi Securities Exchange, to determine the effect of market risk on financial performance of insurance companies listed in the Nairobi Securities Exchange and to determine the effect of credit risk on the financial performance of insurance companies listed in the Nairobi Securities Exchange. Descriptive research design was used the study used all the six listed insurance firms in Kenya , Kenya Re insurance, Liberty Kenya holding limited, Jubilee holding, Pan African insurance holding, Britam and CIC holding. Risk managers, operations managers, marketing managers and finance managers were interviewed in all the six listed insurance firms which consisted of 18 risk managers, 6 operation managers, 6 finance managers and 6 marketing managers. All the independent variables were negative and significant relationship between financial risk and financial performance. Companies can avoid these risks by ensuring correct and effective measures are adhered to.

Kithinji (2010) conducted a study on credit risk management and profitability of commercial banks in Kenya using the non-performing loan portfolio as an indicator of the effectiveness of credit management practices. The intervening variable was the amount of credit as indicated by loans and advances normalized by the total assets. The results were that there was no significant relationship between credit risk management (non-performing loan portfolio), amount of credit and profitability. Siba (2012) carried out a study on the relationship between financial risk management practices and financial performance of commercial banks in Kenya. The study involved 40 commercial banks in Kenya. The study employed questionnaire method for primary data collection, whereas secondary data was obtained from CBK annual supervision reports. The conclusion was that banks had highly effective risk management practices and there was a strong relationship between the bank's performance and the efficiency of the banks risk management practices.

Mauko, muturi, and Mogwambo (2016) researched on influence of financial risk management practices on the performance of commercial banks in Migori County in Kenya. The dependent variables were credit risk management practices, liquidity risk management practices, foreign exchange risk management practices and interest rate risk management practices. From the six banks 32 employees were used in the research, descriptive survey design was used in this study and the findings were that all the independent variables were positively correlated to performance. Regression also showed positive and significant relationship between all the independent variables and performance.

2.6 Critique of Existing Literature

Ling, Alex and Micheal (2014) in their research on impact of foreign currency fluctuation on banks profitability found that foreign loans to total assets were negative to earnings for US large commercial firms. The results were for large firms that drive the economy however a critical view of the whole situation large firms may not be a market representave of the whole market economy in that both small and large firms contribute to the economy thus handling only large firms may have minimum view of the whole situation. In there research Shalibaz, Tabasuum, Muhammad and Hafiz (2012) investigated the impact of risk management on non-performing loans and profitability of the banking sector of Pakistan. In their research five banks were used the panel data revealed that there was no proper mechanism for risk management in banking sector. Five banks results may not show representative of all banks in the whole country. The sample size could have been increased. Though the research gave results it cannot be prudent to rely on as only five banks being used in analysis may not be a representative of all banks in Pakistan.

Imamul and Arif (2015) in their research on relevance of financial risk with financial performance an insight of Indian Banking Sector , the objectives of the research were To assess the relationship between credit risk and financial performance of Commercial banks in India and to measure the impact of liquidity risks financial performance of

commercial banks in India, to measure the impact of interest rate risks financial performance of commercial banks in India to measure the impact of capital risks financial performance of commercial banks in India and to measure the impact of solvency risks financial performance of commercial banks in India. The financial data have been collected from the annual reports of the selected commercial banks and annual reports from the banks websites. The research covered a period 2008 to 2012 thus five year period. This research utilized selected ten leading banks, five from public sector and five from private sector, as representatives on the basis of total assets though the results were Interest Rate Risk and Liquidity Risk were insignificant to performance whereas Solvency Risk Capital Risk and Credit Risk are statistically significant to the financial performance of India Commercial Banks this results cannot be taken to represent all banks in Indian market as only ten banks were used in the research.

Lukorito, Muturi, Nyang'au and Nyamasege (2014) in their research in Kenya all the 43 Commercial banks formed the population and a census was done over a period of 5 years from 2009 to 2013 due to availability of data. The findings of the study showed that Liquidity had statistically significant and positive relationship with banks' profitability. However the research did not explore other forms of banks risks and the correlation between the risks as this is vital for risk managers for decision making and hedging of risk. Abdullah (2013) also studied efficiency of credit risk management on the performance of banks in Nigeria, case study of union bank plc panel data for the years 2006 to 2010 the results showed that credit risk is responsible for 60.4 % for decrease in the variation on return on assets as non-performing loans have negative influence on performance. The fact that one bank was used may not be the representative of all banks in Nigeria, however the Nigerian culture is different from the Kenyan culture hence the results may not be applicable to Kenyan banks.

Waseem and Abdul (2014) researched on impact of interest rate changes on profitability of commercial bank in Pakistan panel data for four years from 2008 to 2012 was used in analysis. Five major banks in Pakistan were used in the sample. The results cannot be taken to represent all banks in Pakistan as private banks and small banks have their own

characteristics which are quite different and unique from major banks. Shalibaz *et al.* (2012) investigated the impact of risk management on non-performing loans and profitability of the banking sector of Pakistan. Though non-performing loans were increasing due to lack risk management techniques which threatened the profitability of the banking results indicated that current ratio was statistically significant on ROE for the two Pakistan banks thus liquidity had negative significant relationship with performance. The authors recommended further research on effects other forms of risk on performance.

2.7 Research Gap

Most developing countries have started deregulating and reforming financial systems, transforming financial institution into effective intermediaries and extending financial services to all segments (Strutt, 2005). The literature reviewed indicates that previous researchers only concentrated on a few variables of financial risk while this study covers additional important variables that have been omitted by previous studies like foreign exchange risk, interest rate risk, market risk and the interaction between the various types of risks.

Aduda and Gitonga (2011) in their research to establish the relationship of credit risk management and profitability in commercial banks in Kenya. A random sample of 30 financial institutions was taken from the population of 43 licensed banks in Kenya. The data for the banks was extracted from the banks' annual reports and financial statements for a ten year period 2000-2009. Non-performing loans ratio was used as a proxy of credit risk. The findings credit risk was significant and negatively correlated to profitability. The authors recommended that further research should be carried out to determine the relationship between other various risk exposures including operational risks, foreign exchange risk, liquidity risk, and interest rate risk faced by commercial banks and their effects on performance.

Kolopo and Dapo (2015) their paper influence of interest rate on the performance of deposit money banks in Nigeria for the period 2002 to 2011 using sample of tier one capital banks top six were used in the sample. All the measures of interest rate were found to have insignificant effect on banks performance. The authors recommended further studies should consider Tier 2 capital banks and incorporate more measures of other risk in their empirical model. Muteti (2014) researched on the relationship between financial risk management and financial performance for commercial banks in Kenya for period 2009. The findings were that credit risk, interest rate risk, foreign exchange risk, were negatively correlated to performance. The author recommended further research to be done for a longer period to captured periods of various trade cycles in order to give broader dimension for the problem. James, Ted and Sorin (2008) undertook a research on foreign exchange risk and the cross section of US returns during the period 1973 to 2002. The findings were that the relationship between foreign exchange rate and expected return was non-linear, market price of foreign exchange risk was found to be negative with stock returns. The authors recommended further research to investigate effects other risks and the relationship between the risks.

2.8 Summary

The growing body of literature has examined the influence of financial risk on financial performance. The multifactor model was utilised. The model assumes competitive and frictionless markets without transaction costs. It indicates that ability of models has risk factors based on anticipated changes on willingness of an investor to take investment risk. In this theory the return of an asset is taken to have two components the predictable part and the unpredictable part. The sources of unexpected part could be firm specific and market related. Firm specific are those factors which are very special to the firm and only affects the firm. In this thesis three theories have been advanced the first being theory of financial intermediation this theory relates to the work undertaken by banks it's based on transaction costs and information asymmetry. The major factors of financial intermediation are based on information asymmetry which may generate imperfection in the market.

Attention should be made on factors that make depositors withdraw their money hence causing liquidity risk. In their cause of financial intermediation careful appraisal of would be customers need to be done if not the bank is likely to experience credit risk. In the normal cause of their business changes in macro-economic variable like changes in interest rate and foreign exchange will affect the risk exposure of the bank hence imperfection in the market causing market risk. Prospect theory was utilised it advances that the risk exposure of a bank is determined by the risk perception and risk taking of the managers. They may be risk averse, risk seeker or indifference this is based on behavioural finance hence making this thesis to seek perception of the managers of the banks on various risks affecting the banks.

Risk management theory was also utilised. The theory indicates that credit and market risk may have direct and indirect effects, though regulators are concerned with overall risk and have minimum concern with individual risk of portfolio components as managers are capable of window dressing the bank position. Risk management theory has two principle approaches to measurement of risk, scenario analysis and value at risk that measures market risk. The variables of study were operationalized through detailed review of relevant empirical literature relating to the statement of the problem and objectives of the study. Empirical studies were used to test the theories and the model and provide more rationale financial risk for organisation.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on data collection, processing and analysis methods that were employed to address the research objectives. The chapter includes data collection instruments and procedures which were used and the target population of the study sample. This was achieved by addressing research and sample designs that were used in the study, data collection and analysis to be used.

3.2 Research Design

Research design is the arrangement of conditions from collection to analysis of data in a way that will aim to combine relevance of research purpose with economic implication. It is the logical manner by which elements of research are compared and analysed so as to interpret the data (Upagade & Shende, 2012). Research design is a blueprint that guides the process of research from the formulation of the research questions and hypotheses to reporting the research findings (Sekaran & Bougie, 2011). Lavrakas (2008) states that selection of an appropriate research design is determined by the nature of research questions and hypotheses, the variables, the sample of participants, the research settings, the data collection methods and data analysis methods.

This thesis is anchored on research philosophy pursued by positivist. A research philosophy relate to belief on how phenomenon is gathered, analysed and used. It is linked to epistemology and ontology. Positivism emerged as a philosophical paradigm in 19th century with Auguste Comte's rejection of metaphysics with his assertion that only scientific knowledge can reveal truth about reality. Positivism adopted Hume's theory of philosophical ontology which focuses on all aspects of being and connections between existents and their mode of being. It studies attributes which belong to items due to their structure and very nature. It requires validation by human editors that gives it usable

content. Ontology refers to what is believed to be true. Hume concluded that reality is orderly interconnected, and thus deducible (Hume, 1993).

Positivism also adopted Descartes's epistemology, a theory of knowledge. He believed that reason is the best way to generate knowledge. Epistemology shows the relationship between the researcher and what is known to be true. Epistemology asks what we know thus having some level of competence, positivist asserts that one can observe events empirically and explain with logical analysis. The emphasis is on micro-level experimentation which eliminates the complexity of the external world. Policies are prescribed based on conclusions made through scientific method (Descartes, 1998).

Positivists' researchers assume a controlled approach in conducting research by identifying research topic, research hypotheses and a suitable methodology. Positivism enables one to apply statistical techniques in testing hypotheses to analyse research data collected using quantitative research techniques. Positivists who believe reality is stable and hence can be observed from an objective viewpoint positivists argue that a phenomena can be isolated and observations can be duplicated (Creswell, 2006). This involves manipulation of reality with variations in independent variable in order to identify regularities and form relationships between constituent elements of the social world (Wilfred, 2006).

The study adopted descriptive survey research design and which assumes world view and several world views (Creswell, 2006). Sekaran and Bougie (2011) argue that descriptive survey design helps one to understand the characteristics of a group in a given situation and assists in systematic thinking about aspects of a given situation. Descriptive survey research design is concerned with characteristics of individuals and whole sample. It provides information useful to solutions of problems. It may be qualitative or quantitative form of expression which are factual and supply practical information (John & Kahn, 2007). Descriptive survey research design employs applications of scientific method which critically analyse and examine the source materials, interpreting data, arrive at generalization and prediction (Neeru, 2012).

According to Zikmund, Babin, Carr and Griffin (2010) descriptive survey research describes characteristics of objects, people, groups, organisations or environments. Kothari (2004) on the other hand note that it's the arrangement of conditions for collection and analysis of data with the aim of combining relevance to research purpose.

3.3 Target Population

Mugenda and Mugenda (2003) refer to population as an entire group of individuals and objects having a common observable characteristic. Zikmund *et al.* (2010) and Kothari (2004) all concur that population is all items in any field of inquiry or 'universe'. Polit and Beck (2003) refer to population as the aggregate of those conforming to a set of specifications. Sekaran and Bougie (2011) defines population as the entire group of people, events or objects of interest that the researcher is to investigate. Lavrakas (2008) explain that a population is any finite or infinite collection of individual objects. There are 44 commercial banks in Kenya (CBK, 2015), which account for two thirds of assets of financial system. Central Bank identified 14 banks, whose ownership was foreign, which account for 32.2% net assets and the rest are local. Four banks were excluded that's Chase bank and imperial bank went into liquidation, Dubai bank went into liquidation, and Charter house bank was under statutory management hence the target population becomes 40 commercial banks.

3.4 Sample

According to Kombo and Tromp (2009) a sample is a finite part of a statistical population whose properties are studied in order to gain generalized information representing the whole universe. It enables one to draw conclusion generalized to the population of interest (Sekaran & Bougie, 2011). Kombo and Tromp (2009) describe a sample as a collection of representative units chosen from the universe.

There are various methods used in sample selection but vary in cost, effort, and skills required. The quality of the sample depends on whether it represents the population with

respect to the variables in the study (Zikmund *et al.,* 2010). For this thesis all the 40 commercial banks were included on condition that they have published accounts for the years 2006 to 2015.

3.5 Data Collection Instruments

The research utilized secondary data. Secondary data was collected from Central Bank of Kenya and various databases of the banks for financial statement for the period 2006 to 2015. Dawson (2009) defines secondary research as collecting data using information from studies of other researchers in an area or subject. According to Ember and Ember (2009) secondary data is one collected by other people. Audited income statements, statement of financial position and cash flow statements were collected from the central bank of Kenya (CBK) and commercial banks websites. The requirement was that the bank was in operation and has published accounts for ten year period from 2006 to 2015.

3.6 Data Collection Procedures

Secondary data was collected from banks website and the Central Bank of Kenya where financial statements were utilised, ratios computed and used during analysis. According to Kothari (2004) primary data is data collected afresh and for the first time, and is original in character. Louis, Lawrence and Morrison (2007) describe primary data as those items that are original to the problem under study. Ember and Ember (2009) describes primary data as data collected by the investigator in various field sites.

The financial statements were obtained from the central bank of Kenya website and individual banks website. The banks were supposed to have published accounts for ten years that is from 2006 to 2015. Central Bank of Kenya is the major licensing institution of commercial banks and mortgage finance institutions in Kenya and hence was used as an authoritative source for banking sector information.

Table: 3. 1 Operationalisation and Measurement of Study Variables

Variable	Name of Variable	Operationalisation	Measurement
Dependent variables	Financial Performance of commercial banks	Return on assets (ROA).	Net profit after tax/ total assets
		Return on equity (ROE)	Net profit after tax/ equity
Independent Variables	Market risk	Value at risk	-Vf α SD
	Foreign exchange risk	Risk against the USD exchange to Kenya shilling	Standard deviation foreign exchange on USD.
	Liquidity risk	i. liquid assets/ total assets ratio	The higher the ratio the lower the risk
		ii. Liquid Assets to Total Deposits ratio	
	Credit risk	i. Non-performing loan to Total loan and advances	The higher the ratio the higher risk
		ii. Total loan to total deposit ratio	
		iii. Capital adequacy (total capital/ total Risk weighted assets)	
	Interest Rate Risk	i. Net loans/total assets	The higher the ratio the higher risk
		ii. Interest income/ Total assets	
Control variable	Size of firm	Total assets	Natural logarithms of total assets

3.7 Data Analysis and Presentation

Data analysis involved both descriptive and inferential statistics where model specification estimation and rationale of variables was done. Secondary data was tested for normality and transformed into natural logarithm before regression undertaken. Primary data was also tested for normality, multi-collineality, and autocorrelation and homoscedastic test then followed by correlation and regression as illustrated below.

3.7.1 Descriptive Statistics

Descriptive statistics was used to determine the statistical properties of the model in order to select the proper functional form of the model, statistical analysis technique was used and mean, standard deviation, skewness, kurtosis, maximum, minimum and jarque bera values of the variables overtime were calculated for secondary data using E-views software.

3.7.2 Model Specification and Rationale of variables

Correlation analysis was used to check which variables were highly correlated so as to avoid the problem of multi-collinearity which is a common problem in time series data. The data included time series and cross-sectional data that were pooled into a panel data set. This was estimated using panel data regression. Multiple regressions were conducted and the data converted to their natural logs to deal with the problem of large numbers and eliminate heteroscedasticity. The reason to stationarize data was to obtain a meaningful sample mean, variance which can show future behaviour if series is stationary but if series is consistently increasing then will underestimate the mean (Jaroslava & Martin, 2005).

In classical unit root tests for financial risk such as Dickey and Fuller (1979) is criticized due to low power of the test in small samples. This thesis employed multiple panel unit root tests that can be arranged in groups by cross section dependence or independence homogenous, or heterogeneous unit roots that are defined by (Im, Pesaran & Shin, 2003;

Levin Lin & Chu. 2002; Maddala & Wu, 1999; Phillips-Perron, 2000). Individual unit root has limited powers hence the probability of rejecting null hypothesis when it's false is present. Common unit root process Levin, Lin and Chu panel unit root test was used and for individual unit root process the thesis used three type of panel unit root tests, Im, Pesaran and Shin panel unit root test, ADF-Fisher chi-square test and the Phillips-Perron -Fisher Chi square panel unit root test.

a) Levin Lin and Chu Test (2002)

Levin, Lin and Chu assume that the three models below produce the stochastic term Y_{it}

Model 1 $Y_{it} = \rho_I y_{I,t-1} + \varepsilon_{I,t}$ (3.2)

Model 2 $Y_{it} = \alpha_i + \rho_I y_{I,t-1} + \varepsilon_{I,t}$ (3.3)

Model 3 $Y_{it} = \alpha_i + \alpha_{it} + \rho_I y_{I,t-1} + \varepsilon_{I,t}$ (3.4)

Where the noise processes $\varepsilon_{I,t}$ are stationary ,first order serial correlation coefficient ρ_1, and $y_{I,t-1}$ is lagged difference . The null and alternative hypothesis for model 1 may be written as H_O $\rho_1 = 1$, and H_O $\rho_1 < 1$. The null hypothesis is that the panel data contain unit root while the alternate hypothesis the panel is stationary. The assumption for model 2 and 3 will be $\alpha_i = 0$ the error term is distributed independently across individuals and is stationary for each individual. The necessary condition for Levin, Lin and Chu is $\sqrt{N}_T /T \rightarrow 0$ while sufficient condition is $N_T /T \rightarrow 0$ and $N_T /T \rightarrow K$. where N_T shows N is a monotonic function of T. If T is very small the test is undersized with low power. For Levin, Lin and Chu the limitation is it relies on assumption of cross section independence and the null hypothesis is very restrictive. The statistics perform well when N lies between 10 -250 and T between 5 -250

b) The Im Pesaran and Shin IPS (2003)

This test for presence of unit roots in panels and it combines information from time series dimension and cross section dimension, thus fewer time observations are required to make the test to have power. IPS test has been found by researchers to have superior test power in analyzing relationships in panel data, this research employed this procedure. IPS specifies ADF regression for a cross-section with individual effects and no time trend as in:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t\ 1} + \sum_{j=1}^{p_j} \beta_{ij} \Delta y_{i,t\ j} + \varepsilon_{it} \qquad (3.5)$$

where $i = 1, \ldots, N$ and $t = 1, \ldots, T$

IPS use separate unit root tests for the N cross-section units. Their test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups.

c) Phillips-Perron (2000) Unit Root Test

The test proposes non-parametric transformation of t- statistics from original Duckey Fuller regressions. Thus under null hypothesis unit root, the transformed statistics have DF distribution.

The test regression for the PP test is

$$Y_{it} = \alpha_i + \rho_I y_{I,t-1} + \varepsilon_{I,t} \qquad (3.6)$$

$$t = 1, 2, \ldots\ldots\ldots T$$

where $\varepsilon_{I,t} = 1$ or 0 may be heteroscedastic.

One advantage of the PP tests over the ADF tests is that the PP tests are robust to general forms of heteroscedasticity in the error term $\varepsilon_{I,t}$ also it does not need to specify a lag length for the test regression If the individual unit root tests are Augmented Dickey-Fuller tests (ADF) then the combined test performed is referred to as Fisher-ADF test. If instead the individual tests are Phillips-Perron test of unit root (PP), then the combine test perform is referred to as Fisher-PP test in E-Views as in equation 3.7 (Hossain, 2014).

$$Y_{it} = \alpha_i + \sum_1^t \rho_I y_{I,t-1} + \varepsilon_{I,t} \quad (3.7)$$

In this test Augument Dickey Fuller ADF for each cross section regression is then followed to obtain residues which are then standardised before OLS regression undertaken. The Im et al, the Fisher-ADF and PP tests allow for individual unit root processes so that may vary across cross-sections. The tests are characterized by combining individual unit root tests to derive a panel-specific result. The regression analysis was run using E-views 7 data analysis software for secondary data as shown in the regressions 3.8 to 3.11. Regression for secondary data was done where the constructs for each variable were regressed on the independent variable, those which were not significant were dropped while those which were significant then regressed in optimal equation with the dependent variables.

Regression Equation of ROA without size of firm

$$Ln\_ROA_{it} = \alpha + \beta_1 Ln\_MR_{it} + \beta_2 \sum_1^n Ln\_CR_{it} + \beta_3 Ln\_FX_{it} + \beta_4 \sum_1^n Ln\_LQ_{it} + \beta_5 \sum_1^n Ln\_IR_{it} + \mu \quad (3.8)$$

Regression Equation of ROA with size of firm as a control variable

$$Ln\_ROA_{it} = \alpha + \beta_1 Ln\_MR_{it} + \beta_2 \sum_1^n Ln\_CR_{it} + \beta_3 Ln\_FX_{it} + \beta_4 \sum_1^n Ln\_LQ_{it} + \beta_5 \sum_1^n Ln\_IR_{it} + \beta_6 Ln\_TA_i t + \mu_{it} \quad (3.9)$$

Regression Equation of ROE without size of firm

$$Ln\_ROE_{it}=\alpha+\beta_1 Ln\_MR_{it}+\beta_2\sum_{1}^{n} Ln\_CR_{it}+\beta_3 Ln\_FX_{it}+\beta_4 \sum_{1}^{n} Ln\_LQ_{it}+\beta_5 \sum_{1}^{n} Ln\_IR_{it}+ \mu_{it} \quad (3.10)$$

Regression Equation of ROE with size of firm as a control variable.

$$Ln\_ROE_{it}=\alpha+\beta_1 Ln\_MR_{it}+\beta_2\sum_{1}^{n} Ln\_CR_{it}+\beta_3 Ln\_FX_{it}+\beta_4 \sum_{1}^{n} Ln\_LQ_{it}+\beta_5 \sum_{1}^{n} Ln\_IR_{it}+\beta_6 Ln\_TA_{it} + \mu_{it} \quad (3.11)$$

Where;

Ln = the natural logs of the variables

MR_{it} = measure of market risk which was VAR for period 2006-2015

CR_{it} = measures of credit risk which were Loans to total deposits, Capital adequacy, Gross non-performing loans for period 2006-2015

FX_{it} = foreign exchange risk for period 2006-2015

LQ_{it} = measures of liquidity risk which were Liquid assets to total assets and Liquid assets to total deposits 2006-2015

IR_{it} = measures of interest rate risk which were Loans to assets ratio and Interest income to total loans ratio for the period 2006 -2015

TA_{it} = Total assets which is a measure of size of bank for period 2006-2015

ROA_{it} = Return on assets for period 2006-2015

ROE_{it} = Return on equity for period 2006-2015

$\beta_1, \beta_2, \beta_3, \beta_4,$ regression coefficient

3.7. 3 Choice of Model

The fixed and random effects were considered in this analysis Panel data analysis has three independent approaches the first one is pooled panels which assumes there are no unique attributes of variables within the measurement set, and no universal effects across time. The second approach is the fixed effects models which assume that there are unique attributes for models which assume the presents of unique, time constant attributes of variables that are the results of random variation which does not correlate with the individual regressors. Al-khouri (2011) employed random and fixed effect regression analysis for their research on the effect of risk characteristics specific to bank on the performance of banks from Gulf cooperation council (GCC) countries. A random effect model assumes the unobserved difference is not correlated with explanatory variables.This model was appropriate when drawing inferences about the whole population. The benefit of using the random effects model is that, regressors allowed time-invariant variables to be included (Greene, 2012) since pooled regression model assumed that all the institutions are the same which is not the case. The two models cater for heterogeneity or individuality among the institutions which allows each institution to have its own intercept value which is time invariant. As to which model between the fixed and random is appropriate, the study used the Hausman test. A Hausman test was used to determine whether to use the fixed effects or random effects model to address objectives of this study.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter contains details of secondary data analysis, sample characteristics, presentation of data analysis, interpretation and discussion of findings. Data presentation is organized starting with secondary data results from 4.2 to 4.4.

4.2 Response Rate

There are 44 commercial banks in Kenya as per CBK 2015 report of which two banks were under receivership that is Chase bank limited and imperial bank hence they did not present financial statement for publication for the year, Charter House bank was under statutory management hence did not publish their financial statements for the year. Thus 4 banks were not included in the population. For this thesis 30 banks were used as their financial for 10 year period 2006 to 2015 were available giving a response rate of 68 % 10 banks did not have financial statements for all the 10 years accounts for some years was missing

4.3 Descriptive Statistics

From the table 4.1 below, the natural logarithms of return on assets and return on equity had a mean of 1.04 and 2.93 while there standard deviations were 0.65 and 0.73 respectively. The measures of credit risk which were Loans to total deposits, Capital adequacy, and gross non-performing loans there natural logarithms had a mean of -0.4, 3.16, and -2.61 with a standard deviation of 0.44, 0.42 and -1.55 respectively. The minimum regulatory capital adequacy ratios, which are measured by the ratio Total Capital to Total Risk Weighted Assets was 14.5 per cent. On the other hand natural logarithms foreign exchange risk had a mean of 0.78 with a standard deviation of 0.64.

Table 4.1: Descriptive Statistics Table

	LN_ROA	LN_ROE	LN_CR1	LN_CR2	LN_CR3	LN_FXR
Mean	1.04	2.93	-0.40	3.16	-2.61	0.78
Maximum	2.34	3.91	0.72	4.27	-1.55	1.82
Minimum	-2.30	-1.11	-3.02	2.24	-3.12	0.11
Std. Dev.	0.65	0.73	0.44	0.42	0.45	0.64
Skewness	-1.10	-1.91	-2.71	0.56	1.09	0.66
Kurtosis	5.02	6.90	6.65	2.61	3.50	1.78
Jarque Bera	106.37	588.07	2571.5	16.72	59.81	38.40
Probabilit	0.00	0.00	0.00	0.00	0.00	0.00

	LN_IR1	LN_IR2	LN_LQ1	LN_LQ2	LN_MR	LN_TA
Mean	-0.75	-2.68	-0.08	0.26	5.95	23.88
Maximum	0.11	2.64	2.29	2.76	7.27	26.87
Minimum	-3.49	-4.71	-0.99	-1.24	4.65	20.31
Std. Dev.	0.43	1.05	0.30	0.36	0.81	1.40
Skewness	-3.58	3.41	6.11	3.62	0.33	0.22
Kurtosis	2.25	6.84	4.63	2.06	1.99	1.87
Jarque Bera	5028.9	2835.0	26584.69	7523.84	17.25	17.53
Probabilit	0.00	0.00	0.00	0.00	0.00	0.00

From the table 4.1, measures of interest rate risk Loans to assets ratio and Interest income to total loans ratio there natural logarithms had a mean of -0.75 and – 2.68 with a standard deviation of 0.43 and 1.05 respectively The measures of liquidity risk which were Liquid assets to total assets and Liquid assets to total deposits. The mean of their natural logarithm were -0.08 and 0.26 with a standard deviation of 0.3 and 0.36 respectively. The natural logarithms of Market risk had a mean of 5.95 while standard deviation was 0.18. Size of the bank measured by the natural logarithm of total assets had a mean of 23.88 and the standard deviation was 1.4. The mean value of return on assets (DROA) and return on equity (DROE) are significantly positive, thus commercial bank in Kenya are enjoying a healthy profitability.

Three statistical methods were used to test normality, skewness measure the asymmetry of the distribution while kurtosis measure the flatness or peakedness of the distribution. A distribution is considered normal if the values of skewness and kurtosis are equal to zero. LN_ROA LN_ROE LN_CR1 and LN_IR1 are negatively skewed they are flatter to the left as compared to normal distribution except for LN_CR2, LN_CR3, LN_FXR LN_LQ1, LN_LQ2, LN_MR and LN_TA are positively skewed. Monte-carlo simulations indicate that skewness of value smaller than 2 and kurtosis value smaller than 6 should be considered normal. Skewness of value 2.0 to 3.0 and kurtosis values 6.0 to 21.0 are considered as non-normal. Skewness of value greater than 3and kurtosis greater than 21 is considered extremely non-normal (Tabor, 2011). From the table above skewness ranges from -3.58 to 6.11 thus indicating most measures of variables are normal except LN_IR2, LN_LQ1 and LN_LQ2. Negative skewness meant asymmetrical distribution for both return on assets LN_ROA and return on equity LN_ROE with a long tail to the left meaning decrease in performance in the observed periods.

Kurtosis has a range 1.87 to 6.90 indicating the data for some measures is normal except LN_ROE, LN_CR1, and LN_IR2. Jarque Bera test is normally used to test whether a given series is normal or not. The null hypothesis show that the series is normally distributed and alternate hypothesis is that the series is not normally distributed. Applying the Jarque-Bera test of normality, the probability values are less than 0.05,

thus normality was rejected at 5% significance level by Jarque- Bera tests. Ghasemi and Zahedias (2012) in there paper normality tests for statistical analysis, a guide for non-statisticians recommend that normality be assessed visually. With large samples (<30 or 40) the violation of normality assumption should not cause major problems (Oztuna, Elhan & Tuccar, 2006). Thus we can use parametric procedures as in large samples (<30 or 40) sampling distribution tend to be normal regardless of the shape of the data

4.4 Panel Unit Root Test

In this research evaluation of stationarity of the variables in the model was done using multiple unit root tests which were most applicable for unbalanced panels. Stationary means the variance mean, and autocorrelation of a variable does not change with time. From the table 4.4 above p-value in parentheses, ** and * denote rejection of null hypothesis at 1% and 5 % significance respectively. All panel unit root tests have null hypothesis tests of non-stationary financial risk. It can be seen that the probability of Levin, Lin and Chu statistic for all the variables has a value < 0.01 which is significant at 1% level of significance hence using Levin, Lin and Chu test it rejects the null of unit root this shows that the variables are stationery and has no unit root. Im, Pesaran and Shin unit root test, Augmented Dickie-Fuller ADF-Fisher Chi-square, Phillips-Perron-Fisher Chi square, were also implemented most confirm stationary data hence no unit root except for natural logarithm of assets where both tests failed to reject natural logarithm total assets (Ln_TA) at both 1% and 5% level respectively. Due to presence of unit root as shown by the above data, first difference treatment was implemented on the data to be used in this thesis as illustrated table 4.5. Ali (2015) researched on effect of credit risk on management on financial performance of the Jordan commercial banks. Thirteen commercial banks were used. Credit risk indicators used in the research were capital adequacy, non-performing loan to gross loans, credit interest to credit facilities, and leverage ratio. Performance was measured by return on assets and return on equity. In this research stationarity were tested using multiple panel unit root on the first difference.

Table 4. 2: Unit Root Tests

VARIABLES	Levin, Lin & Chu Stat (Prob.)	Im, Pesaran & Shin (Prob.)	Augmented Dickie-Fuller (ADF) (Prob.)	Phillips-Perron (Prob.)	Integration Level
LN_ROA	-17.3650** (0.0000)	-5.61010** (0.0000)	128.228** (0.0000)	136.681** (0.0000)	I(0)
LN_ROE	-18.9953** (0.0000)	-4.21825** (0.0000)	89.6074** (0.0049)	99.9764** (0.0005)	I(0)
LN_CR1	-4.02930** (0.0000)	-0.5939* (0.0230)	77.1283** (0.0074)	102.392** (0.0005)	I(0)
LN_CR2	-5.40747** (0.0000)	-1.62754* (0.0018)	79.7851* (0.0047)	97.4201** (0.0016)	I(0)
LN_CR3	-22.1682** (0.0000)	-12.4345** (0.0000)	257.304** (0.0000)	230.622** (0.0000)	I(0)
LN_FXR	-14.9420** (0.0000)	-6.41183** (0.0000)	161.479** (0.0000)	259.230** (0.0000)	I(0)
LN_IR1	-7.39139** (0.0000)	-2.35889** (0.0092)	99.6348** (0.0010)	143.562** (0.0000)	I(0)
LN_IR2	-7.60608** (0.0000)	-2.73885** (0.0031)	96.1649** (0.0021)	122.715** (0.0000)	I(0)
LN_LQ1	-49.9088** (0.0000)	-18.7008** (0.0000)	205.654** (0.0000)	200.768** (0.0000)	I(0)
LN_LQ2	-8.66064** (0.0000)	-2.86757** (0.0028)	100.490** (0.0002)	107.181** (0.0008)	I(0)
LN_MR	-19.1775** (0.0000)	-8.42168** (0.0000)	200.533** (0.0000)	150.609** (0.0000)	I(0)
LN_TA	-6.52055** (0.0000)	1.53162 (0.9372)	67.6310 (0.2329)	76.5499 (0.0735)	I(0)

Notation; D-First difference * sig at 5% level, ** sig at 1% level Values in parenthesis are probability values.

From the table 4.2 above after the first difference both Levin, Lin and Chu test (2002) and Phillips-Perron (2000) Im, Pesaran and Shin unit root test (2003), Augmented Dickie-Fuller ADF-Fisher Chi-square rejects the null of unit root this showed that all variables are stationery and has no unit root hence the subsequent regression used first difference for all variables as in table 4.3 below

Table 4. 3: Unit Root Tests for First Difference

VARIABLES	Levin, Lin & Chu Stat (Prob.)	Im, Pesaran & Shin (Prob.)	Augmented Dickie-Fuller (ADF) (Prob.)	Phillips-Perron (Prob.)	Integration Level
DROA	-18.9620** (0.0000)	-8.10319** (0.0000)	182.205** (0.0000)	258.141** (0.0000)	I(1)
DROE	-24.3900** (0.0000)	-9.97184** (0.0000)	207.365** (0.0000)	234.224** (0.0000)	I(1)
DCR1	-22.8310** (0.0000)	-10.0962** (0.0000)	213.608** (0.0000)	243.812** (0.0000)	I(1)
DCR2	-17.5899** (0.0000)	-7.66382** (0.0000)	181.554** (0.0000)	237.962** (0.0000)	I(1)
DCR3	-13.6184** (0.0000)	-4.40128** (0.0000)	120.003** (0.0000)	120.003** (0.0000)	I(1)
DFXR	-15.8984** (0.0000)	-6.77792** (0.0000)	173.623** (0.0000)	299.119** (0.0000)	I(1)
DIR1	-17.9893** (0.0000)	-9.09546** (0.0001)	205.675** (0.0000)	278.257** (0.0000)	I(1)
DIR2	-15.0990** (0.0000)	-6.93500** (0.0000)	170.975** (0.0000)	234.684** (0.0000)	I(1)
DLQ1	-44.1169** (0.0000)	-15.8540** (0.0000)	245.221** (0.0000)	298.917** (0.0000)	I(1)
DLQ2	-15.4858** (0.0000)	-7.98110** (0.0000)	193.089** (0.0000)	274.920** (0.0000)	I(1)
DMR	-20.0995** (0.0000)	-8.62414** (0.0000)	208.559** (0.0000)	157.511** (0.0000)	I(1)
DTA	-19.9461** (0.000)	-7.68182** (0.0000)	173.821** (0.0000)	202.289** (0.0000)	I(1)

Notation; D-First difference ** sig at 1% level Values in parenthesis are probability values.

4.5 Correlation Results

From table 4.4 below Ln_CR2, Ln_FXR, Ln_LQ1, Ln_LQ2 and Ln_MR had weak positive correlations with Ln_ROA with coefficients of 0.29, 0.06, 0.12, 0.05 and 0.05 respectively while Ln_TA had medium positive correlation with Ln_ROA with a

coefficient of 0.51. This therefore means that capital adequacy; foreign exchange risk, liquidity to total assets, liquid assets to total deposit and market risk have a weak positive correlation with return on assets. Ln-CR1, Ln_CR3, IR1 and IR2 had weak negative correlations with Ln_ROA with correlation coefficients of -0.12, -0.25,-0.07 and -0.05 respectively meaning that loans to deposit, gross non-performing loans, loans to asset and interest income to total loans have weak negative correlations with return on assets. The correlation results indicate that there is no multicolinearity among independent variable and the dependent variable as the correlations are below 0.9 (Ahmed & Ahmed, 2012).

Table 4. 4: Correlation of ROA with Independent Variables

	LN_ROA	LN_ROE
LN_ROA	1.000000	1.000000
LN_CR1	-0.115749	-0.148012
LN_CR2	0.029424	-0.194791
LN_CR3	-0.246890	-0.097006
LN_FXR	0.061435	-0.000260
LN_IR1	-0.073478	-0.065333
LN_IR2	-0.047050	-0.087203
LN_LQ1	0.124142	0.030915
LN_LQ2	0.046764	-0.083201
LN_MR	0.048112	-0.014361
LN_TA	0.507486	0.532028

Notations;

ROA	-	Return on assets
CR1	-	Loans to total deposits ratio
CR2	-	Capital adequacy
CR3	-	Gross non-performing loans ratio
FXR	-	Foreign exchange risk
IR1	-	Loans to assets ratio
IR2	-	Interest income to total loans ratio
LQ1	-	Liquid assets to total assets ratio

LQ2	-	Liquid assets to total deposits ratio
MR	-	Market risk
TA	-	Total assets
LN_	-	Natural log of

From the table 4.4 above it can be concluded that ln_CR1, ln_CR2, ln_CR3, ln_FXR, ln_IR1, ln_IR2, ln_LQ2, and ln_MR with coefficients -0.15, -0.19, -0.09, -0.0002, -0.06, -0.09, -0.08, and -0.01 respectively have a weak negative correlation with ln_ROE. This means that loans to total deposit, capital adequacy, gross non-performing loans ratio, foreign exchange risk, loans to asset ratio, interest income to total loans, liquid assets to total deposit and market risk have a weak correlation to return on assets for commercial banks in Kenya. LN_TA with coefficient 0.53 has a medium positive correlation with LN_ROE which means that total assets a measure of size of the firm has a medium positive correlation with return on equity for commercial banks in Kenya. LN_LQ1 with coefficient 0.03 has a weak positive correlation with LN_ROE which also means that liquid assets to total assets ratio have a weak positive correlation to return on equity for commercial banks in Kenya. The correlation results indicate that there is no multicolinearity as the correlations are below 0.9 (Ahmed & Ahmed 2012).

4.6 Regression Results for Secondary Data

This section presents the results for multiple regression analysis the first being financial performances represented by return on assets and return on equity against each of the construct for each risk. The construct which were not significant were dropped but those which were significant were retained and regressed in the optimal equation. Size of the bank measured by natural logarithm of total assets was then included in the optimal equation as a control variable for each of the dependent variables. In this research the natural logarithms of the actual values of the variables were used to deal with the problem of large numbers and eliminate Heteroscedasticity were calculated using the e-views software. Random and fixed effects model was used after applying Hausman test.

4.6.1 Hausman Test

The Hausman test statistic is a transformation of difference between the parameter estimates from fixed effects and random effects estimation that becomes asymptotically $\chi 2$ chi- square distributed under null hypothesis. Hausman tests the null hypothesis of an absence of correlation between individual specific effects and the regressors. The basic idea for the test is that under the null hypothesis of orthogonality both OLS and GLS are consistent while under alternate hypothesis is not consistent. For this thesis, the values were then differenced (1^{st} difference) to ensure the data is stationary but before regression, a Hausman test was used to determine whether to use the fixed effects or random effects model to address objectives of this study.

Table 4. 5: Hausman Test

	Return on assets (DROA)	Return on equity (DROE)
Chi-Sq. Statistic	7.965140	6.299273
Prob.	0.5377	0.7096

From the table 4.5 The Hausman test is distributed as chi-square with 1 degree of freedom. From the table Return on assets (DROA) show the probability of the cross section random effects was 0.5377 which is greater than 0.05 implying that it's appropriate to adopt random effects model. For return on equity (DREO) the probability was 0.7096 which was > 0.05 hence we conclude that the test selected the random effects model.

4.6.2 Financial Performance and Credit Risk Measures

The null hypothesis **H_{o1}:** Credit risk has no significant influence on financial performance of commercial banks in Kenya.

Table 4. 6: Regression of ROA on Credit Risk Measures

Regression results of DROA with credit risk indicators
Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DCR1	0.008889	0.122157	0.072771	0.9420
DCR2	0.284456	0.153862	1.848774	0.0657
DCR3	-0.370670	0.119944	-3.090353	0.0022
C	-0.009918	0.035650	-0.278202	0.7811

Weighted Statistics

R-squared	0.058107	Mean dependent var	0.038635
Adjusted R-squared	0.046667	S.D. dependent var	0.496043
S.E. of regression	0.484330	Sum squared resid	57.94028
F-statistic	5.079304	Durbin-Watson stat	2.381078
Prob(F-statistic)	0.001981		

Unweighted Statistics

R-squared	0.058107	Mean dependent var	0.038635
Sum squared resid	57.94028	Durbin-Watson stat	2.381078

From the table 4.6 above the model is significant at 1% level as the probability value was less than 0.01. The Durbin- Watson value was 2.381078 indicating that there was no autocorrelation problem (Garson, 2012; Alsaeed, 2005). The Durbin-Watson value should be around 2, if the value of Durbin-Watson is below 1 then there is serial correlation. The value of R-squared was 0.0581 showing that credit risk indicators explain 5.8% variance in performance indicator return on assets.

The partial regression coefficient for Loan to deposit ratio DCR1 was 0.00889 shows that with influence of other explanatory variables held constant increase in one percent in Loan to deposit ratio makes Return on assets to increase by 0.00889 per cent. The partial regression coefficient for Capital adequacy DCR2 was 0.284456 shows that with influence of other explanatory variables held constant increase in one percent in capital adequacy make Return on assets DROA to increase by 0.284456 per cent. Loan to total deposit ratio (DCRI) and capital adequacy ratio (DCR2) had coefficients 0.0089 and 0.2845 respectively though not significant with performance proxy return on assets. Other researchers found contradicting result like research on effects of credit risk indicator on share-holders value of commercial banks in Iran showed significant negative effects of capital adequacy (Hamed, Sanaz & Hadi, 2013).

Gross non-performing loans ratio (DCR3) as a measure of credit risk had a coefficient of -0.370670 with a probability of 0.0022 thus significant at 1% level (p value < 0.01) this shows that gross non-performing loans ratio had a negative relationship with return on assets as a measure of performance for commercial banks in Kenya. This that implies that 0.37067 being the regression coefficient for Gross non-performing loans ratio shows that with influence of other explanatory variables held constant increase in one percent in gross non performing loans makes Return on assets to decrease by 0.37067 per cent. This research agrees with results of other researchers who also found a negative relationship between non-performing loans ratio as a measure of credit risk and performance (Asad, Syed, Wasim & Rana, 2014; Abdelrahim, 2013; Boahene, Dasah & Agyei, 2012) while others whose research contradicts this research found non-

performing loans ratio had a positive and significant relationship to measures of performance (Li & Zou, 2014; Harison & Joseph, 2012; Shaffer, 2012).

It can be concluded that based on the results above for Gross non-performing loan (DCR3) and return on assets, this research rejects the first null hypothesis that credit risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for credit risk proxies becomes;

$Y_{DROA} = 0.0099 + 0.00889\ DCR1 + 0.28446 DCR2 – 0.3707\ DCR3$

Table 4. 7: Regression of ROE on Credit Risk Measures.

Dependent Variable: DROE
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DCR1	-0.057040	0.127453	-0.447533	0.6549
DCR2	-0.293133	0.160533	-1.825992	0.0691
DCR3	-0.311576	0.125145	-2.489720	0.0134
C	-0.051952	0.037196	-1.396696	0.1638

Weighted Statistics

R-squared	0.036546	Mean dependent var	-0.009853
Adjusted R-squared	0.024844	S.D. dependent var	0.510277
S.E. of regression	0.503899	Sum squared resid	62.71673
F-statistic	3.123108	Durbin-Watson stat	2.120546
Prob(F-statistic)	0.026571		

Unweighted Statistics

R-squared	0.036546	Mean dependent var	-0.009853
Sum squared resid	62.71673	Durbin-Watson stat	2.120546

From the table 4.7 above the model was significant at 5% level as the probability value was less than 0.05. The Durbin- Watson value was 2.12 indicating that there is no autocorrelation problem (Garson, 2012; Alsaeed, 2005). The value of R-squared was 0.0366 showing that credit risk indicators explain 3.66% variance in performance indicator return on equity.

The partial regression coefficient for Loan to deposit ratio DCR1 was -0.057 shows that with influence of other explanatory variables held constant decrease in one percent in Loan to deposit ratio makes Return on assets to increase by 0.057 per cent. The partial regression coefficient for Capital adequacy DCR2 was -0.2931 shows that with influence of other explanatory variables held constant decrease in one percent in capital adequacy makes Return on assets DROA to increase by 0.2931 per cent. Loan to total deposit ratio (DCRI) and capital adequacy ratio (DCR2) had coefficients -0.057 and -0.2931 respectively though the relationship was negative they are not significant with performance proxy return on equity DCROE.

Gross non-performing loans ratio (DCR3) as a measure of credit risk had a coefficient of -0.3116 with a probability of 0.0134 thus significant at 5% level (p value < 0.05) this shows that gross non-performing loans ratio had a negative relationship with return on equity as a measure of performance for commercial banks in Kenya. Thus with partial regression coefficient -0.3116 shows that with influence of other explanatory variables held constant decrease in one percent in Gross non-performing loans ratio (DCR3) makes Return on equity to increase by 0.3116 per cent. In Ghana similar research on credit risk and profitability of selected rural banks in Ghana non-performing loans as proxies for credit risk had positive relationship to performance and it was significant at 1% (Harison & Joseph, 2012).

It can be concluded that based on the results above for Gross non-performing loan (DCR3) and return on equity, this thesis reject the first null hypothesis that credit risk has no significant influence on financial performance of commercial banks in Kenya.

This result was similar to when return on assets was used as a proxy for performance. The regression equation for the model then becomes;

$$Y_{DROE} = -0.052 - 0.057\ DCR1 - 0.2931DCR2 - 0.312DCR3$$

4.6.3 Financial Performance and Interest Rate Risk Measures

The null hypothesis **H_{o2}:** Interest rate risk has no significant influence on financial performance of commercial banks in Kenya.

Table 4. 8: Regression of ROA and Interest Rate Risk Proxies

Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIR1	0.019624	0.155327	0.126342	0.8996
DIR2	0.265714	0.111040	2.392955	0.0175
C	0.036183	0.032937	1.098540	0.2730
Weighted Statistics				
R-squared	0.024710	Mean dependent var		0.038635
Adjusted R-squared	0.016845	S.D. dependent var		0.496043
S.E. of regression	0.491848	Sum squared resid		59.99468
F-statistic	3.141719	Durbin-Watson stat		2.302948
Prob(F-statistic)	0.044933			
Unweighted Statistics				
R-squared	0.024710	Mean dependent var		0.038635
Sum squared resid	59.99468	Durbin-Watson stat		2.302948

From the table 4.8 above the model was significant at 5% level as the probability value was 0.0449 which less than 0.05. The Durbin- Watson value was 2.3029 indicating that there is no autocorrelation problem (Garson, 2012; Alsaeed, 2005). The value of R-squared was 0.0247 showing that interest rate risk proxies explain 2.47% variance in performance indicator return on assets. The partial regression coefficient for Loan to

total assets ratio DIR1 was 0.0196 shows that with influence of other explanatory variables held constant increase in one percent in Loan to total assets ratio makes Return on assets to increase by 0.0196 per cent. The partial regression coefficient for interest income to total loans DIR2 was 0.2657 shows that with influence of other explanatory variables held constant increase in one percent interest income to total loans DIR2 make Return on assets DROA to increase by 0.2657 per cent.

Interest income to total loans (DIR2) had a coefficient 0.2657 with a p value of 0.0175 the relationship was positive and significant at 5% level. Zairy and Salina (2010) in a similar research on Islamic banks exposures to rate of return and risk found that Islamic banks had a significant positive correlation between interest rate risk and performance. Loans to total asset ratio (DIR1) has a coefficient of 0.01962 which is not significant as the p value was greater than 0.05. Kolopo and Dapo (2015) found similar results in research for the period 2002 to 2011 in Nigeria a sample of tier one capital banks, using fixed effects regression analysis method interest rate had insignificant effect on banks performance.

It can be concluded that based on the results above for interest income to total loans (DIR2) and return on assets this thesis rejects the second null hypothesis that interest rate risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes,

$Y_{DROA} = 0.0362 + 0.0196\ DIR1 + 0.266 DIR2$

Table 4. 9: Regression of ROE on Interest Rate Measures

Dependent Variable: DROE
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROE(-1)	-0.168027	0.071861	-2.338229	0.0203
DIR1	0.020120	0.168836	0.119167	0.9053
DIR2	0.119258	0.111852	1.066216	0.2875
C	-0.020973	0.034326	-0.610996	0.5418

Weighted Statistics

R-squared	0.033089	Mean dependent var	-0.023831
Adjusted R-squared	0.019660	S.D. dependent var	0.484747
S.E. of regression	0.479959	Sum squared resid	49.75780
F-statistic	3.163967	Durbin-Watson stat	1.929994
Prob(F-statistic)	0.043348		

From the table 4.9 above the model is significant at 5% level as the probability value is 0.043348 which less than 0.05. The Durbin- Watson value is 1.92999 the introduction of lags makes Durbin Watson may not be a suitable test of autocorrelation (Garson, 2012; Alsaeed, 2005) the suitable test to determine autocorrelation problem is use of Durbin h. which is suitable when lagged depended variable is used. The formula to obtain Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

Where DW is the Durbin Watson value, T is the number of observations ERROR is the standard error square for the lag.

$$h_1 = 1 - \frac{1.93}{2}\sqrt{\frac{29}{1 - 29(0.072)^2}}$$

$$= 0.035 \times 5.842 = 0.20447$$

Using two a two sided test at 5% significance which has the critical value of 1.96 since the test value is 0.20447 which is smaller than the critical value it can be inferred that the error terms are not serially correlated. The partial regression coefficient for Loan to total assets ratio DIR1 was 0.0201 shows that with influence of other explanatory variables held constant increase in one percent in Loan to total assets ratio makes Return on equity DROE to increase by 0.0201 per cent. The partial regression coefficient for interest income to total loans DIR2 was 0.1193 shows that with influence of other explanatory variables held constant increase in one percent interest income to total loans DIR2 make Return on equity DROE to increase by 0.1193 per cent.

The value of R-squared was 0.03309 showing that interest risk proxies explain 3.309% variance in performance. From the regression inclusion of a lagged dependent variable (DROE)in the model increases power of the model thus the lagged return on equity introduced as an independent variable had a coefficient of -0.168 and it was significant at 5% level as p value is less than 0.05. The ratio of interest income to total loans (DIR2) and loans to asset ratio (DIR1) had coefficient of 0.1193 and 0.0201 respectively and they were not significant as p value was greater than 0.05. Similar research using fixed effects regression analysis method interest rate had insignificant effect on banks performance in Nigerian (Kolopo & Dapo, 2015).

It can be concluded that based on the results above for the two proxies of interest rate risk, interest income to total assets (DIR1), interest income to total loans (DIR2) and return on equity (ROE), this thesis fails to rejects the second null hypothesis that interest rate risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes;

$Y_{DROE} = -0.021 + 0.168\ DIR1 - 0.020DIR2 - 0.119DIR3$

4.6.4 Financial Performance and Liquidity Risk Measures

The null hypothesis $\mathbf{H_{o3}}$: Liquidity risk has no significant influence on financial performance of commercial banks in Kenya.

Table 4. 10: Regression of Return on Assets and Liquidity Risk Proxies

Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLQ1	0.451822	0.193305	2.337351	0.0202
DLQ2	-0.294881	0.182674	-1.614249	0.1077
C	0.029085	0.031984	0.909386	0.3640

Weighted Statistics

R-squared	0.030655	Mean dependent var	0.038635
Adjusted R-squared	0.022838	S.D. dependent var	0.496043
S.E. of regression	0.490346	Sum squared resid	59.62898
F-statistic	3.921455	Durbin-Watson stat	2.318165
Prob(F-statistic)	0.021053		

From the table above 4.10 the model was significant at 5% level as the probability value was 0.021 which less than 0.05. The Durbin- Watson value was 2.3029 indicating that there is no autocorrelation problem. The value of R-squared was 0.0307 showing that liquidity risk indicators explain 3.07% variance in performance indicator return on assets. The partial regression coefficient for Liquid assets to total assets ratio DLQ1 was 0.452 shows that with influence of other explanatory variables held constant increase in one percent in Liquid assets to total assets ratio makes Return on assets DROA to increase by 0.452 per cent. The partial regression coefficient for Liquid assets to total deposits DIR2 was -0.295 shows that with influence of other explanatory variables held constant increase in one percent interest income to total loans DIR2 make Return on assets DROA to decrease by 0.295 per cent.

Liquid assets to total assets ratio (DLQ1) had a coefficient of 0.452 with a p value of 0.0202 which was significant at 5% level. Similar research by other authors found liquidity risk significant and positively correlated to a net interest margins a measure of performance for European countries (Chortareas, Girardone & Ventouri, 2011). Liquid asset to total deposit ratio (DLQ2) had a coefficient of -0.2949 thus a negative relationship to performance proxy return on assets (DROA) the p value was 0.108 which means that it was not significant at 5% level. Ongore and Kusa (2013) research on the relationship between liquidity risk and profitability for Kenyan banks in 2008-2011 was insignificant.

It can be concluded that based on the results above for Liquid assets to total assets ratio (DLQ1) and return on assets, this thesis rejects the third null hypothesis that liquidity risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes;

$Y_{DROA} = 0.0291 + 0.451\ DLQ1 - 0.2948 DLQ2$

Table 4. 11: Regression of ROE and Liquidity Risk Measures

Dependent Variable: DROE
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROE(-1)	-0.174365	0.071916	-2.424583	0.0161
DLQ1	0.079765	0.206230	0.386776	0.6993
DLQ2	0.020653	0.192353	0.107369	0.9146
C	-0.019404	0.033213	-0.584230	0.5597

Weighted Statistics

R-squared	0.035312	Mean dependent var	-0.023831
Adjusted R-squared	0.021913	S.D. dependent var	0.484747
S.E. of regression	0.479407	Sum squared resid	49.64343
F-statistic	3.141719	Durbin-Watson stat	1.947546
Prob(F-statistic)	0.044933		

From the table 4.11 above the model is significant at 5% level as the probability value was 0.0449 which less than 0.05. The Durbin- Watson value was 1.9475 but due to using lagged ROE this thesis had to use Durbin h which is suitable when lagged independent variable is used.

Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$1 - \frac{1.95}{2}\sqrt{\frac{29}{1 - 29(0.072)^2}}$$

$$= 0.025 \times 5.842 = 0.1461$$

Using two a two sided test at 5% significance which has the critical value of 1.96. since the test value 0.1461 smaller than the critical value it can be inferred that the error terms are not serially correlated

The value of R-squared was 0.035312 showing that liquidity risk indicators explain 3.53% variance in performance indicator return on equity. The lagged return on equity introduced as an independent variable had a coefficient of -0.1744 and it was significant at 5% level as p value is less than 0.05. The partial regression coefficient for Liquid assets to total assets ratio DLQ1 was -0.0798 shows that with influence of other explanatory variables held constant increase in one percent in Liquid assets to total assets ratio makes Return on equity DROE to increase by 0.0798 per cent. The partial regression coefficient for Liquid assets to total deposits DIR2 was 0.0206 shows that with influence of other explanatory variables held constant increase in one percent interest income to total loans DIR2 make Return on equity DROE to increase by 0.0206 per cent. Liquid assets to total assets ratio (DLQ1) and Liquid asset to total deposit ratio (DLQ2) had a coefficient of 0.0798 and 0.0207 respectively and are not significant. Ongore and Kusa (2013) had findings similar to this research where the relationship between liquidity and bank profitability for Kenyan banks was insignificant.

It can be concluded that based on the results above for the two proxies of liquidity risk, liquid assets to total assets ratio (DLQ1), Liquid assets to total deposit (DLQ2) and return on equity (ROE), this thesis fails to rejects the third null hypothesis that liquidity risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes;

$Y_{DROA} = -0.0194 + 0.0798\ DLQ1 + 0.0207DLQ2 – 0.312DROE(-1)$

4.6.5 Financial Performance and Foreign Exchange Rate Risk

The null hypotheses **H_{04}:** Foreign exchange risk has no significant influence on financial performance of commercial banks in Kenya.

Table 4. 12: Regression of ROA with Foreign Exchange Rate Risk Measure

Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROA(-1)	-0.200380	0.061272	-3.270327	0.0012
DFXR	0.021042	0.030847	0.682154	0.4959
C	0.017780	0.031011	0.573366	0.5670

Weighted Statistics

R-squared	0.049712	Mean dependent var	0.007344
Adjusted R-squared	0.040953	S.D. dependent var	0.451268
S.E. of regression	0.441931	Sum squared resid	42.38070
F-statistic	5.675863	Durbin-Watson stat	2.215081
Prob(F-statistic)	0.003957		

Unweighted Statistics

R-squared	0.049712	Mean dependent var	0.007344
Sum squared resid	42.38070	Durbin-Watson stat	2.215081

From the table 4.12 above the model was significant at 5% level as the probability value was 0.00396 which less than 0.05. The Durbin- Watson value is 2.215 but due to using lagged ROA this thesis had to use Durbin h which is suitable when lagged independent variable is used. Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$1 - \frac{2.22}{2}\sqrt{\frac{19}{1 - 19(0.061)^2}}$$

$$= -0.4972$$

Using two a sided test at 5% significance which has the critical value of 1.96. since the test value 0.4972 is smaller than the critical value it can be inferred that the error terms are not serially correlated. The value of R-squared was 0.0497 showing that foreign exchange risk indicator explain 4.97% variance in performance indicator return on assets. The lagged return on assets introduced as an independent variable had a coefficient of -0.2004. The model was significant at 5% level as p value was 0.0012 which is less than 0.05.

The partial regression coefficient for Foreign exchange risk DFXR was 0.021 shows that with influence of other explanatory variables held constant increase in one percent in Foreign exchange risk DFXR makes Return on assets DROA to increase by 0.021 per cent. Foreign exchange risk had a coefficient of 0.021042 thus a positive relationship though not significant. Ding (2012) in their research for 34 European countries agree with this finding where foreign exchange volatility does not improve performance of the model thus it was not significant. Similar research found that foreign loans to total assets as proxy for foreign exchange risk had negative relationship to earnings for US large commercial firms (Ling, Alex & Micheal, 2014).

It can be concluded that based on the results above foreign exchange risk (DFXR) and return on assets proxy for financial performance, this thesis fails to rejects the fourth null hypothesis that foreign exchange rate risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes; $Y_{DROA} = 0.0178 + 0.021\ DFXR - 0.2004DROA(-1)$

Table 4. 13: Regression of ROE on Foreign Exchange Risk

Dependent Variable: DROE
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROE(-1)	-0.178140	0.072664	-2.451564	0.0150
DFXR	0.013170	0.032939	0.399837	0.6897
C	-0.020775	0.033284	-0.624178	0.5332
Weighted Statistics				
R-squared	0.028145	Mean dependent var		-0.023831
Adjusted R-squared	0.019188	S.D. dependent var		0.484747
S.E. of regression	0.480074	Sum squared resid		50.01222
F-statistic	3.142214	Durbin-Watson stat		1.921995
Prob(F-statistic)	0.045159			

The table 4.13 above show the regression of return on equity and performance, lagged return on equity was introduced in the model to make it feasible. The model was significant at 5% level as the probability value is 0.04516 which less than 0.05. The Durbin- Watson value is 1.922 due to using lagged ROE this thesis had to use Durbin h which is suitable when lagged dependent variable is used.

Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$1 - \frac{1.92}{2}\sqrt{\frac{19}{1 - 19(0.072)^2}}$$

$$= 0.04 \times 4.59 = 0.1836$$

Using two a two sided test at 5% significance which has the critical value of 1.96. since the test value 0.1836 is smaller than the critical value it can be inferred that the error terms are not serially correlated. The value of R-squared was 0.0281 showing that foreign exchange risk indicator explain 2.81% variance in performance indicator return on equity. The partial regression coefficient for Foreign exchange risk DFXR was 0.013 shows that with influence of other explanatory variables held constant increase in one percent in Foreign exchange risk DFXR makes Return on equity DROE to increase by 0.013 per cent. The lagged return on equity introduced as an independent variable had a negative relationship with performance and was significant at 5% level. Foreign exchange risk had a coefficient 0.0132 with p value 0f 0.6897 which was not significant at 1% or 5% level respectively. Alex and Micheal (2014) disagrees with the findings of this research where foreign exchange risk had a negative significant relationship to earnings for US large commercial firms.

It can be concluded that based on the results above foreign exchange risk (DFXR) and return on equity proxy for financial performance, this thesis fails to rejects the fourth null hypothesis that foreign exchange rate risk has significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes;

$$Y_{DROE} = -0.0208 + 0.0132\ DFXR - 0.1781DROE$$

4.6.6 Financial Performance and Market Risk

The null hypothesis **H_{o5}:** Market risk has no significant influence on financial performance of commercial banks in Kenya.

Table 4. 14: Regression of ROA with Market Risk

Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMR	0.887730	0.023751	37.37632	0.0000
C	-0.140807	0.014457	-9.739577	0.0000
Weighted Statistics				
R-squared	0.857439	Mean dependent var		0.035819
Adjusted R-squared	0.856822	S.D. dependent var		0.506304
S.E. of regression	0.191586	Sum squared resid		8.478867
F-statistic	1389.364	Durbin-Watson stat		1.634552
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.855716	Mean dependent var		0.039258
Sum squared resid	8.670601	Durbin-Watson stat		1.598407

From the table 4.14 above the model was significant at 1% level as the probability value was 0.000 which less than 0.01. The Durbin- Watson value was 1.6346 indicating that there is no autocorrelation problem. The value of R-squared was 0.8574 showing that market risk indicators explain 85.74 % variance in performance indicator return on assets. From the table market risk (DMR) had coefficient of 0.8877 which shows that the relation was positive and the p value was 0.000 thus significant at 1% level.

Pariyada (2013) agrees with the findings of this research where market risk was a major component in sensitivity of bank stock returns thus the relationship was positive and significant for Thai commercial bank. It can be concluded that based on the results

above market risk (DMR) and return on assets (ROA) proxy for financial performance, this research to rejects the fifth null hypothesis that market risk has no significant influence on financial performance of commercial banks in Kenya. The regression equation for the model then becomes; $Y_{DROA} = -0.1408 + 0.8877$ DMR

Table 4. 15: Regression of ROE With Market Risk Measures

Dependent Variable: DROE

Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Erro'r	t-Statistic	Prob.
DMR	0.718366	0.044649	16.08936	0.0000
C	-0.158622	0.025349	-6.257527	0.0000

Weighted Statistics			
R-squared	0.532458	Mean dependent var	-0.012997
Adjusted R-squared	0.530434	S.D. dependent var	0.523210
S.E. of regression	0.358529	Sum squared resid	29.69349
F-statistic	263.0735	Durbin-Watson stat	1.575132
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.532458	Mean dependent var	-0.012997
Sum squared resid	29.69349	Durbin-Watson stat	1.575132

The table 4.15 above shows the regression results using random model for market risk and return on equity. The model was significant at 1% level as the probability value was 0.000 which was less than 0.01. The Durbin- Watson value was 1.575 indicating that there was no autocorrelation problem. The value of R-squared was 0.5325 showing that market risk indicators explain 53.25 % variance in performance indicator return on equity. From the table above market risk (DMR) had coefficient of 0.7184 which shows that the relation was positive and the p value was 0.000 thus significant at 1% level.

Pariyada (2013) findings in Thai commercial banks agree with this finding where market risk was a major component in sensitivity of bank stock returns and the relationship was positive and significant. It can be concluded that based on the results above market risk (DMR) and return on equity (ROE) proxy for financial performance that this research fails to rejects the null hypothesis that market risk has no significant influence on financial performance of commercial banks in Kenya. The regression for the model becomes; Y_{ROE} = -0.158 + O.7184 DMR, This indicates that when market risk is zero, return on equity will be -0.158 and when market risk increases by 0.7184 units return on equity will increase by one unit.

4.6.7 Optimal Regression for Return on Equity

Table 4.16: Optimal Regression of DROE using random effects

Dependent Variable: DROE
Method: Panel EGLS (Cross-section random effects)
Sample (adjusted): 2008 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROE(-1)	-0.067957	0.052791	-1.287289	0.1995
DMR	0.755196	0.052378	14.41812	0.0000
DCR3	-0.101501	0.139448	-0.727875	0.4675
C	-0.158440	0.026636	-5.948250	0.0000

Effects Specification	S.D	Rho
Cross-section random	0.021961	0.0042
Idiosyncratic random	0.340023	0.9958

Weighted Statistics

R-squared	0.537327	Mean dependent var	-0.024357
Adjusted R-squared	0.530387	S.D. dependent var	0.497020
S.E. of regression	0.340599	Sum squared resid	23.20152
F-statistic	77.42370	Durbin-Watson stat	1.617122
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.536502	Mean dependent var	-0.024724
Sum squared resid	23.29191	Durbin-Watson stat	1.610846

To obtain optimal equation the measures of risk in previous regressions that were not significant were eliminated leaving only the ones which were significant. From the previous analysis Gross non-performing loans ratio (DCR3), market risk DMR and lagged return on equity DROE were significant hence included in the optimal regression. From the table 4.17 the probability (F-statistic) was 0.000 which means that it was significant at 5% level this means that model was feasible. The Durbin-Watson value was 1.617 but due to using lagged ROE this thesis had to use Durbin h which is suitable when lagged independent variable is used.

Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$\text{h} = 1 - \frac{1.617}{2}\sqrt{\frac{29}{1 - 29(0.053)^2}}$$

$$= 0.1915 \times 5.32 = 0.018$$

Using two a two sided test at 5% significance which has the critical value of 1.96. since the test value 0.018 smaller than the critical value it can be inferred that the error terms are not serially correlated (Garson, 2012; Alsaeed, 2005). The value of R-squared was 0.5373 indicating the independent variables explain 53.73 % of variance in the dependent variable return on equity.

Market risk (DMR) had a partial regression coefficient 0.7552 with a p value of 0.000 (p value < 0.01) which was significant at 1% level, this means that with influence of other explanatory variables held constant increase in one percent when market risk increase by one percent causes return on equity (DROE) to increase by 0.7552. It can be concluded that market risk had a positive relationship with return on equity (DROE) this is similar to (Pariyada, 2013).

From the equation below it shows that if all variables are zero return on equity would be -0.1584. The partial regression coefficient for Gross non performing loans ratio DCR3 was -0.101 show assuming other explanatory variables are constant increase in one percent in Gross non performing loans ratio DCR3 makes Return on Equity DROE to decrease by 0.101 per cent. The partial regression coefficient for Market risk DMR was 0.7552 show assuming other explanatory variables are constant increase in one percent in Market risk DMR makes Return on Equity DROE to increase by 0.7552 per cent. While the partial regression coefficient for lagged return on equity DROE (-1) was -0.06796 show assuming other explanatory variables are constant increase in one percent in lagged return on equity DROE (-1) makes Return on Equity DROE to decrease by 0.7552 per cent.

Gross non-performing loans ratio (DCR3) had a coefficient -0.1015, which means credit risk had a negative relationship to return to equity and it was not significant to return on equity (DROE) for commercial banks in Kenya as the p value 0.4675 which was greater than 0.05. Lagged return on equity had a coefficient of -0.06796 thus a negative relationship with return on equity though not significant as the p value was 0.1995 which was greater than 0.05. The regression equation of the optimal model for return on equity then becomes; $Y_{DROE} = -0.1584 - 0.1015DCR3 + 0.7552DMR - 0.06796\ DROE(-1)$

Table 4. 17: Optimal Regression with Bank Size as Control.

Dependent Variable: DROE
Method: Panel EGLS (Cross-section random effects)
Date: 03/10/17 Time: 22:20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROE(-1)	-0.066414	0.052886	-1.255792	0.2107
DMR	0.767028	0.053291	14.39323	0.0000
DCR3	-0.128328	0.141347	-0.907897	0.3650
DTA	-0.252244	0.193036	-1.306722	0.1928
C	-0.121305	0.038696	-3.134813	0.0020

Weighted Statistics

R-squared	0.540454	Mean dependent var	-0.024724
Adjusted R-squared	0.53 1217	S.D. dependent var	0.497543
S.E. of regression	0.340657	Sum squared resid	23.09334
F-statistic	58.50895	Durbin-Watson stat	1.633505
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.540454	Mean dependent var	-0.024724
Sum squared resid	23.09334	Durbin-Watson stat	1.633505

The table 4.18 above show the regression model of return on equity and various measures of risk. In this section bank size (DTA) was included in the model as a control variable. The model was significant at 1% level p value < 0.01 thus the model fitness is authenticated showing strong relationship between the stated financial risk and performance of the commercial bank with bank size as a control variable. The Durbin-Watson statistic was 1.6335 but due to using lagged ROE this thesis had to use Durbin h which is suitable when lagged independent variable is used.

Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$1 - \frac{1.63}{2}\sqrt{\frac{39}{1 - 39(0.053)^2}}$$

$$= 0.185 \times 6.618 = 1.224$$

Using two a two sided test at 5% significance which has the critical value of 1.96. since the test value 1.224 is smaller than the critical value it can be inferred that the error terms are not serially correlated (Garson, 2012; Alsaeed, 2005).

The value of R square was 0.5405 which means credit risk, market risk, lagged return on return on equity and bank size explain 54.05% of variance in performance measure return on equity. From the table it can be noted that gross non-performing loans ratio (DCR3) had a coefficient -0.1283 p value 0.365 (p value > 0.05) and it was not significant at 5% level. Thus gross non-performing loans ratio as a measure of credit risk had a negative relationship to return on equity for commercial banks in Kenya. Market risk had a coefficient of 0.767 with a p-value of 0.0000 (p value < 0.05) this indicates that market risk had a positive relationship to return on equity (DROE) and it was significant at 5% level. This research is similar to another researcher where market risk had a positive and significant relationship with stock returns as a measure of performance for Thai commercial bank (Pariyada, 2013).

Lagged return on equity DROE(-) had a coefficient of -0.0664 which means it had a negative relationship to return on assets the p value is 0.2107 thus not significant at 5% level. Bank size had a coefficient -0.2522 with a p value 0.1928 hence not significant as p value of was > 0.05. Thus bank size as a control variable had no control effects on the model. Amr and Osama (2015) agree with the findings of this research where bank size had an insignificant positive relation with performance. This means that size of a bank

does not influence profitability levels hence no control effects on the model. The model becomes;

$Y_{DROE} = - 0.1213 - 0.0664DROE (-1) + 0.767DMR - 0.1283DCR3 - 0.2522DTA$

From the equation it shows that if all variables are zero return on equity would be -0.1213. The partial regression coefficient for Gross non performing loans ratio DCR3 was -0.1283 show assuming other explanatory variables are constant increase in one percent in Gross non performing loans ratio DCR3 makes Return on Equity DROE to decrease by 0.1283 per cent. The partial regression coefficient for Market risk DMR was 0.767 shows assuming other explanatory variables are constant increase in one percent in Market risk DMR makes Return on Equity DROE to increase by 0.767 per cent. The partial regression coefficient for Bank size DTA was 0.2522 shows assuming other explanatory variables are constant increase in one percent in Bank size DTA makes Return on Equity DROE to decrease by 0.2522 per cent. While the partial regression coefficient for lagged return on equity DROE (-1) was -0.0664 show assuming other explanatory variables are constant increase in one percent in lagged return on equity DROE (-1) makes Return on Equity DROE to decrease by 0.0664 per cent.

From the above results it can be seen that without bank size as a control variable only marker risk was significant while the rest were insignificant but when bank size was introduced the significance of the variables did not change. It can be concluded that based on the results bank size (DTA) and return on equity (ROE) proxy for financial performance, this research fails rejects the sixth null hypothesis that bank size as a control variable has no significant influence on financial performance of commercial banks in Kenya.

4.6.8 Optimal Regression for Return on Assets

Table 4.18: Optimal Regression of DROA Using Random Effects

Regression of return on assets DROA using random effects
Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROA(-1)	-0.011054	0.016257	-0.679935	0.4973
DCR3	-0.103563	0.047755	-2.168663	0.0313
DIR2	0.113755	0.026426	4.304642	0.0000
DLQ1	0.014209	0.018387	0.772759	0.4406
DMR	0.942691	0.017895	52.68007	0.0000
C	-0.144898	0.008930	-16.22596	0.0000

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.114689	1.0000

Weighted Statistics			
R-squared	0.934368	Mean dependent var	0.009106
Adjusted R-squared	0.932711	S.D. dependent var	0.462815
S.E. of regression	0.120055	Sum squared resid	2.853809
F-statistic	563.7677	Durbin-Watson stat	1.517124
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.934368	Mean dependent var	0.009106
Sum squared resid	2.853809	Durbin-Watson stat	1.517124

The table 4.19 above show the regression model of return on assets and various measures of risk. In this section the following variables were included in the optimal regression model as they were significant in the previous analysis, they include Interest income to total loans ratio (DIR2), Gross non-performing loans ratio (DCR3), DMR Market risk and Liquid assets to total assets ratio DLQ1.The model was significant at

1% level of significance p value < 0.01 thus feasible model that is the model fitness showed strong relationship between the stated financial risks and performance of the commercial bank hence the model is stable. The Durbin-Watson statistic was 1.517 but due to using lagged ROA this thesis had to use Durbin Watson h which is suitable when lagged independent variable is used.

Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$\text{h} = 1 - \frac{1.52}{2}\sqrt{\frac{49}{1 - 49(0.0163)^2}}$$

$$= 0.24 \times 7.046 = 1.6910$$

Using two a two sided test at 5% significance which has the critical value of 1.96. since the test value 1.9910 is smaller than the critical value it can be inferred that the error terms are not serially correlated (Garson, 2012; Alsaeed, 2005). The value of R square was 0.9344 which means credit risk, market risk, lagged return on assets and bank size explain 93.44% of variance in performance measure return on assets.

Interest income to total loans ratio (DIR2) a measure of Interest rate risk had a coefficient of 0.1138 with a p value 0.0000 (p value < 0.01) this was significant at 1% level thus Interest income to total loans ratio had a positive relationship with return on assets as a measure of performance for commercial banks in Kenya. Zairy and Salina (2010) agrees with the findings of this research where they found a strong positive correlation between rate of return risk and performance. Zagonov, Kiswani and Mash (2009) findings do not agree with the findings of this research where performance was negatively correlated to interest rate risk this could be explained by the fact that management failed to hedge the risk.

Gross non-performing loans ratio (DCR3) as a measure of credit risk had a coefficient of -0.1036 with a probability 0.0313 it was significant at 5% level (p value < 0.05) this

shows that gross non-performing loans ratio had a negative relationship with return on assets as a measure of performance for commercial banks in Kenya. Several researchers agree with the findings of this research where they found a negative and significant relationship between non-performing loans ratio as a measure of credit risk and performance (Asad, Syed, Wasim & Rana, 2014; Abdelrahim, 2013; Boahene, Dasah & Agyei, 2012). Research by other authors found contradicting results where non-performing loans ratio had a positive and significant relationship to measures of performance (Li & Zou, 2014; Harison & Joseph, 2012).

DMR Market risk had a coefficient of 0.9427 with a p value of 0.0000 (p value <0.01) this shows that it is significant at 1% level thus market risk had a positive relationship with return on assets as a measure of performance and it's significant. According to Pariyada (2013) in a similar research on sensitivity of stock returns for Thai commercial banks, the results were that market risk was a major component in sensitivity of bank stock returns hence agreeing with the finding of this research as large banks were found to be more sensitive to changes in market conditions than medium and small banks.

Liquid assets to total assets ratio DLQ1 had a coefficient of 0.0142 with a p value of 0.4406 (p value > 0.05). This shows that liquid assets to total assets ratio was not significant to performance. This could be due to the fact that statutory requirement for liquidity set by the CBK was 20% while the average liquidity ratio stood at 38.1% and 37.7% respectively for 2015 and 2014 respectively This could be due to effects of Basel III Capital requirements aimed at providing banks with sufficient reserves so as to with stand future crises. The regression equation for the model used in this thesis becomes; Y_{DROA} = -0.1449 - 0.1105 DROA (-1) - 0.1036DCR3 - 0.1138 DIR2 + 0.0142DLQ1+ 0.9427DMR.

From the equation it shows that if all variables are zero return on Assets would be -0.1213. The partial regression coefficient for Gross non performing loans ratio DCR3 was -0.1036 show assuming other explanatory variables are constant increase in one percent in Gross non performing loans ratio DCR3 makes Return on Assets DROA to

decrease by 0.1036 per cent. The partial regression coefficient for Market risk DMR was 0.9427 show assuming other explanatory variables are constant increase in one percent in Market risk DMR makes Return on Assets DROA to increase by 0.9427 per cent. The partial regression coefficient for Liquid assets to total assets ratio DLQ1 as proxy for liquidity risk was 0.0142 show assuming other explanatory variables are constant increase in one percent in Liquidity risk makes Return on Assets DROA to increase by 0.0142 per cent.

The partial regression coefficient for Interest rate income to total loans DIR2 as a proxy of interest rate risk was -0.1138 show assuming other explanatory variables are constant increase in one percent in Interest rate income to total loans DIR2 makes Return on Assets DROA to decrease by 0.1138 per cent. While the partial regression coefficient for lagged return on Assets DROA(-1) was -0.0664 show assuming other explanatory variables are constant increase in one percent in lagged return on equity DROE(-1) makes Return on assets DROA to decrease by 0.0664 per cent.

Null hypotheses **H_{o6}:** Bank size has no significant control effects on the relationship between financial risk and financial performance of banks in Kenya.

Table 4.19: Optimal Regression with Bank Size as Control

Dependent Variable: DROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DROA(-1)	-0.010230	0.016298	-0.627640	0.5310
DCR3	-0.106128	0.047883	-2.216423	0.0278
DIR2	0.114770	0.026478	4.334594	0.0000
DLQ1	0.063640	0.053626	1.186736	0.2368
DMR	0.942030	0.017929	52.54344	0.0000
DTA	-0.049034	0.049963	-0.981418	0.3276
C	-0.145253	0.008948	-16.23309	0.0000

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.114826	1.0000

Weighted Statistics			
R-squared	0.934660	Mean dependent var	0.009106
Adjusted R-squared	0.932670	S.D. dependent var	0.462815
S.E. of regression	0.120091	Sum squared resid	2.841110
F-statistic	469.6698	Durbin-Watson stat	1.521397
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.934660	Mean dependent var	0.009106
Sum squared resid	2.841110	Durbin-Watson stat	1.521397

From the table 4.20 the probability of this model was 0.0000 which is < 0.01 this shows that the regression model is significant at 1% level hence suitable. The Durbin- Watson value was 1.5214 but due to using lagged ROA this thesis had to use Durbin Watson h which is suitable when lagged independent variable is used.

Durbin h is given by the following

$$h_1 = 1 - \frac{DW}{2}\sqrt{\frac{T}{1 - T(ERROR)^2}}$$

$$1 - \frac{1.52}{2}\sqrt{\frac{29}{1 - 29(0.072)^2}}$$

$$= 0.24 \times 7.742 = 1.858$$

Using two a two sided test at 5% significance which has the critical value of 1.96. since the test value 1.858 is smaller than the critical value it can be inferred that the error terms are not serially correlated (Garson, 2012; Alsaeed, 2005). The value of R squared was 0.9347 thus the independent variables used in this optimum model (lagged return on assets, credit risk, liquidity risk and market risk) explains 93.47% of the variance in return on assets proxy for performance.

Gross non-performing loans ratio (DCR3) had regression coefficients of -0.1061with a p value of 0.0278 showing a negative relationship between credit risk and performance. It was significant at 5 % level (p value <0.05). This means that when credit risk measured by Gross non-performing loans increase by 0.1061% return on assets (DROA) would increase by 1 % in opposite direction. Other researchers in similar research found contradicting results where credit risk had a significant positive relationship with performance (Ogboi & Unuafe, 2013; Harison & Joseph, 2012; Kolapo, Ayeni & Oke, 2012; Khizer, Muhammad & Shama, 2011). Finding from other researchers agreed with the findings of this research where credit risks had a negative and significant relationship with financial performance (Hamed, Sanaz & Hadi, 2013; Muhammad, 2012; Aman & Zaman, 2010; Peter & Peter, 2006).

Market risk (DMR) had a regression coefficient of 0.9420 with a p value 0.0000 this shows that market risk had positive relationship with performance represented by return on assets. The relationship was significant at 1% level (p value < 0.05). As market risk increase by 0.9420 % return on assets (DROA) would increase by 1 %. This research is similar to other researchers whose research on sensitivity of stock

returns for Thai commercial banks had a significant positive relationship to performance proxy (Pariyada 2013).

Loans to asset ratio (DIR2) had a coefficient of 0.1148 with p value of 0.000 which show that interest rate risk has a positive and significant relationship with performance proxy return on assets. This means that as interest rate risk (DIR2) increase by 0.1148% return on assets will increase by 1%. Researchers whose findings agree with this research also found that increase in interest rate depress borrowers and depositors but increases performance. Thus when banks charge high interest rate they gain high return from borrower and at the same time discourage depositors by giving them low returns as they have no options but to accept the prevailing rate given by the bank (Khawaja & Musleh, 2007).

The other researchers whose findings contradicts this research whose panel data for four years 2008 to 2012 showed a significant negative correlation between interest rate risk and performance banks in Pakistan (Waseem & Abdul, 2014). Liquid assets to total assets (DLQ1) had a coefficient of 0.0636 with a p value of 0.2368. Though the relationship with return on assets is positive it's not significant. The bank size (DTA) has no control effects on the model as it was not significant and had no impact on the significance of other independent variables. It also had insignificant effects on the value of R squared. These findings are similar to other researchers who found for banks Size for Nigerian banks had no control effect on performance (Olusanmi, uwuigbe & uwuigbe, 2013).

From the equation it shows that if all variables are zero return on Assets would be -0.1453. The partial regression coefficient for Gross non performing loans ratio DCR3 was -0.1061 show assuming other explanatory variables are constant increase in one percent in Gross non performing loans ratio DCR3 makes Return on Assets DROA to decrease by 0.1061 per cent. The partial regression coefficient for Market risk DMR was 0.9420 show assuming other explanatory variables are constant increase in one percent in Market risk DMR makes Return on Assets DROA to increase by 0.9420 per cent. The partial regression coefficient for Liquid assets to total assets ratio DLQ1 as proxy for liquidity risk was 0.0636 show assuming other

explanatory variables are constant increase in one percent in Liquidity risk makes Return on Assets DROA to increase by 0.0636 per cent.

The partial regression coefficient for Interest rate income to total loans DIR2 as a proxy of interest rate risk was 0.1148 show assuming other explanatory variables are constant increase in one percent in Interest rate income to total loans DIR2 makes Return on Assets DROA to increase by 0.1148 per cent. While the partial regression coefficient for lagged return on assets DROA (-1) was -0.0102 show assuming other explanatory variables are constant increase in one percent in lagged return on Assets DROA(-1) makes Return on Assets DROA to decrease by 0.0102 per cent.

From the regression results market risk has a greater influence on performance followed by interest rate risk then credit risk and lastly liquidity risk. It can be concluded that based on the results bank size (DTA), this research rejects the sixth null hypothesis that bank size as a control variable has no significant influence on financial performance of banks in Kenya. The regression equation for the optimal model for return on assets then becomes; Y_{DROA}= -0.1453 - 0.0102 DROE(-1) - 0.1061DCR3 + 0.1148 DIR2 + 0.0636 DLQ1+ 0.942DMR - 0.0490 DTA

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The objective of the study was to determine the influence of financial risk on performance of commercial banks in Kenya. From this overall objective, this study aimed at finding out the influence credit risk, interest rate risk, liquidity risk, foreign exchange risk and market risk on financial performance of commercial bank in Kenya. The research sought to determine the influence of firms' size as a control variable on financial performance of commercial Banks in Kenya.This chapter presents the summary of major findings of the study, the conclusions of influence of financial risk on commercial banks in Kenya. Finally, the chapter highlights important recommendations for further research.

5.2 Summary of the Findings

This study was conducted on the premise that financial risk has significant influence on performance of commercial banks in Kenya. The study reviewed both theoretical and empirical literature on financial risk. From the review of related literature, a conceptual framework was constructed to conceptualize the relationship between financial risk and financial performance of commercial banks in Kenya.

The hypothesized relationship was then tested empirically and was guided by the following specific objectives. To establish the influence of credit risk on financial performance of commercial Banks in Kenya, to establish the influence of interest rate risk on financial performance of commercial Banks in Kenya, to establish the influence of liquidity risk on financial performance of commercial Banks in Kenya, to determine the influence of foreign exchange risk on financial performance of commercial Banks in Kenya, to determine the influence of market risk on financial performance of commercial Banks in Kenya and to determine the influence of firms size as a control variable on financial performance of commercial Banks in Kenya. These relationships have been shown in the conceptual framework.

Using the conceptual framework together with objectives of the study, the research used both primary and secondary tools. Panel data from financial statements of commercial banks in Kenya were obtained from the central bank of Kenya website and individual banks website for the period 2006 to 2015. Financial ratios were used to measure various financial risks including credit risk, interest rate risk and liquidity. Market risk and foreign exchange risk were measured using value at risk and standard deviation of exchange rate of Kenya shilling against the US dollar respectively. Multiple regressions for a univariate analysis were conducted after the data converted to their natural logs to deal with the problem of large numbers and eliminate heteroscedasticity. Stationarity of the data was checked; where multiple unit root test was done and due to presence of unit root the first difference was done on the data to have the data stationary, the reason for having data stationary was to obtain a meaningful sample mean, variance which would show future behaviour if series was stationary. Hausman test was done and random effects model was adopted. Linear regression for each variable was undertaken then significant variables were retained and used to test the combined effect of independent variables and the control effects of firm size in the optimal model.

For primary data questionnaire that was used was similar to one used by authors in their studies and was tested both for reliability using Cronbach's alpha (α) through a pilot study and validity using factor analysis for construct validity. The questionnaire was then used to collect the primary data for both the independent variables and dependent variables from 40 commercial banks in Kenya. The correlation between the dependent variable and dependent variable performance was done. The independent variables were tested for multi-collinearity using variance inflation factors or tolerance, Durbin –Watson test was used to test for autocorrelation and normality was tested.

Statistical package for social sciences (SPSS) version 20.0 was used for analysis all through. Quantitative data was analyzed using descriptive and inferential statistics. Multiple linear regression analysis was used to test the combined effect of all the independent variables.

5.2.1 Credit Risk and its Influence on Performance.

The first objective was to determine the influence of credit risk on financial performance of commercial banks in Kenya. The results revealed using panel data correlation values for credit risk proxies Loans to total deposits ratio (DCR1), Capital adequacy (DCR2) and Gross non-performing loans ratio (DCR3) were very low this indicated that there was no multicolinearity in the values of credit risk and performance. The findings from correlation and regression showed that credit risk measured by gross non- performing loans (DCR3) had a significant negative relationship with performance proxies both in the initial and optimal models.

5.2.2 Interest Rate Risk and its Influence on Performance

The second objective of this study was to determine the influence of interest rate risk on performance of commercial bank in Kenya. The results revealed using panel data correlation values for interest rate risk proxies, Loans to assets ratio (DIR1) and Interest income to total loans ratio (DIR2) were very low this indicated that there is no multicolinearity in the values of interest rate risk. For regression with panel data only interest income to total loans (DIR2) had a positive significant relationship with return on assets (DROA) in the initial and optimal model though insignificant relationship with return on equity (DROE). Net loans to total assets ratio (DIR1) had an insignificant relationship with both return on assets (DROA) and return on equity (DROE).

5.2.3 Liquidity Risk and its Influence on Performance

The results for panel data correlation values for liquid assets to total assets (DLQ1) and liquid assets to total deposits (DLQ2) were very low this indicated that there is no multicolinearity in the values of liquidity risk. The regression results liquid assets to total assets (DLQ1) showed significant positive relationship with return on assets (DROA) in the initial model but insignificant in the optimal model, though it showed insignificant relationship with return on equity (DROE). Liquid assets to total deposits (DLQ2) results were not significant with both performance proxies.

5.2.4 Foreign Exchange Risk and its Influence on Performance

For primary data results for correlation and regression, Foreign exchange risk had a significant positively relationship with performance and the probability of the model from the anova was significant. The results for panel data correlation values for foreign exchange risk was low this indicates that there is no multicolinearity in the values of foreign exchange risk. Regression results of foreign exchange risk with performance proxies were not significant hence this variable was not included in the optimal model.

5.2.5 Market Risk and its Influence on Performance

The results for panel data show that correlation values for market risk were very low this indicates that there is no multicolinearity in the values of market risk. From the regression and correlation results with market risk were positively correlated to performance proxies and all were significant for both initial and optimal model with all proxies of performance for commercial banks in Kenya.

5.2.6 Control Effects of Firm Size on Performance

From the panel data regression results for optimal model using return on assets **(**DROA**)**, Interest income to total loans ratio (DIR2), Market risk (DMR) and Gross non-performing loans ratio (DCR3) were significant while liquidity risk measured by liquid asset to total asset ratio (DLQ1) was insignificant. When bank size was introduced as a control variable there was no effect on their significance also bank size was not significant. The regression results when using return on equity (DROE), Gross non-performing loans ratio (DCR3) was not significant while Market risk (DMR) was significant but when bank size was introduced as a control variable, there was no effect on the significance of Market risk (DMR) and Gross non-performing loans ratio (DCR3) and the fact that the value of R-square for the model also decreased.

5.3 Conclusion

Based on the empirical evidence, a number of logical conclusions can be made as follows in the sections 5.3.1 to 5.3.6 below.

5.3.1 Influence of Credit Risk on Performance

It can be concluded that there exists a negative and significant relationship between credit risk and performance of commercial banks in Kenya. This means that when non-performing loans increase the performance of banks decrease. Increase in non-performing loans could be due to delayed payment challenges in business environment which enhances reclassification of loans and high interest rate leading to down grading of loan accounts by banks. This makes non-performing loans to be very costly to recover and regulatory controls in place may lead to deterioration of assets quality, which is associated with high risk exposure.

5.3.2 Influence of Interest Rate Risk on Performance

The measure of interest rate risk, interest income to total loans (DIR2) had a positive relationship with performance using panel data regression results. This implies that commercial banks increase profits when interest rates risk increase, thus most of the interest rate variability favors the commercial banks profitability. The availability of credit, financial markets and government activities such as credit squeeze through central bank is likely to have impact on performance. It can be concluded that there exists a positive and significant relationship between interest rate risk and performance of commercial banks in Kenya.

5.3.3 Influence of Liquidity Risk on Performance

In the optimal model using return on assets (DROA) liquidity risk represented by liquid assets to total assets (DLQ1) was not significant this could be due to CBK policy, the statutory liquidity requirement in Kenya stood at twenty percent which all commercial banks were to strictly adhere to and the average liquidity for commercial banks in Kenya for the 2014- 2015 stood at thirty seven and thirty eight percent

respectively which was well above the statutory requirement. This could explain the reason why liquidity risk was not significant for commercial banks in Kenya.

5.3.4 Influence of Foreign Exchange Risk on Performance

Using panel data the relationship was not significant. Thus as foreign exchange risk increase performance of commercial banks in Kenya also increases but not significant. From the bank managers views they seem to be of the opinion that in any case foreign exchange risk happen to occur the profits of the bank or financial performance of commercial banks increases this makes bank managers to be optimistic.

5.3.5 Influence of Market risk on performance

Market risk for secondary data obtained from commercial bank panel data for ten years, had a significant positive relationship with performance. This means that when market risk increase performance shown by return on assets (DROA) and return on equity (DROE) would increase. From primary data results from both correlation and regression showed a positive and significant relationship between market risk and performance thus increase in market risk makes performance to increase. Thus market risk is a major component in financial risk which has a great impact on the performance of commercial banks in Kenya.

5.3.6 Control Effect of Bank Size on Performance

Based on the panel data, when bank size was introduced as a control variable in the optimal mode, in both cases bank size was not significant and the significance of other variables was not affected. This means that bank size did not have significant control effects on the model. This means that the size of the bank has insignificant effects on the performance of commercial banks in Kenya.

5.4 Recommendations of the Study

The following recommendations have been made based on the study findings as shown below.

5.4.1 Credit Risk and Its Influence on Performance

The results of this research show that credit risk measured by Gross non-performing loans ratio was negatively related to return on assets as a measure of performance. Bank managers should adopt policies to ensure debtors figure does not increase at a high rate than total capital as this increases credit risk. The managers can minimize credit risk by ensuring that the credit worthiness of would be borrowers is assessed together with the collateral which should be wholly ensured. Thus managers should be cautious when setting up credit policies that will not impact negatively of the bank's performance.

The lending policies should outline the allocation and scope of credit facilities by establishing the limits which could be based on group authority that allow committees to approve large loans. Also the frequency of committees meetings and reporting procedures should be specified, Managers require understanding how credit policy affects the banks performance to be able to ensure proper utilization of banks deposits as improper management of credit risk will increase the non-performing loans this may result in to financial distress.

Central bank of Kenya for the purpose of policy should asses the attitudes of lending of banks by inspecting the degree of credit crunch considering the demand and supply of loans in the security markets and increased competitiveness of the market by having various portfolios to stabilize the market. The Central Bank Prudential Guideline on Capital Adequacy requires banks to adhere to the prescribed capital adequacy prudential ratios.

5.4.2 Interest Rate Risk and Its Influence on Performance

From the results it can be seen that the variability in interest rate favors performance positively. The recommendation for interest rate is that commercial banks in Kenya could focus on hedging and forecasting the macroeconomic factors that determine interest rates rather than the focusing on interest rates themselves this will enable them to project profitable business. The managers should install latest advances in their system processes to monitor interest rate risk and adequately have transparency and enhance operational efficiency.

5.4.3 Liquidity Risk and its Influence on Performance

Liquidity held by commercial banks depicts their ability to fund increases in assets and meet obligations as they fall due. Liquidity is one of the important financial stability indicators since liquidity shortfall in one bank can cause systemic crisis in the banking sector due to their interconnected operations. The liquidity risk for commercial banks in Kenya was not significant this could be attributed to increase in liquidity of commercial banks in Kenya as per central bank regulations thus bank managers should be aware of liquidity of their banks so as to help to enhance investment portfolio hence providing competitive edge in the market. Managers should ensure that commercial banks invest excess cash in productive assets. This ensures that they do not hold excess cash at the expense of fixed assets that can improve profitability.

Bank managers should regularly gauge their capacity to raise funds quickly from each source thus identify the main factors that affect their ability to acquire funds and monitor the factors closely so as to ensure that sound liquidity. Banks supervisors should have a supervisory framework to enable them make assessments of banks' liquidity risk management and adequacy of their liquidity, in both normal times and periods of stress.

5.4.4 Foreign Exchange Risk and Its Influence on Performance

Foreign exchange risk was positively related to performance this means that fluctuations in the Kenya Shilling exchange rate to the US dollar increased performance of commercial banks in Kenya. Thus managers should steer their banks toward trading in foreign exchange as this will improve performance of the banks as increase in foreign exchange risk leads to increase in performance or profitability.

5.4.5 Market Risk and its Influence on Performance

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

It's highly recommended that more attention to be paid to market risk as it has greater influence on performance both with return on assets (ROA) and return on equity (ROE). Thus managers should put in place conventional risk management where they should adopt proactive approaches and be forewarned by developing regulatory insight to avoid legal risks.

5.4.6 Control Effect of Bank Size on Performance

From the conclusion on control effects of bank size, the findings show that firm size has insignificant control effects on the model. Thus managers perceive that firm size has no influence on performance when financial risk is considered for commercial banks in Kenya. Thus small commercial banks still have an opportunity to perform equally with large commercial banks. Hence small investors should not fear investing in banking sector in Kenya due to economies of scale that large banks may assume to have.

5.5 Contribution of Research

This research study contributes to literature in several ways which are grouped into two categories according to the nature, which include methodological contributions and theoretical contributions. The study is unique in its methodology adopted where it assess the interaction of various financial risk and probe link with banks performance. The research encompasses different combinations of data collection data analysis and procedures that provide methodological contribution in the field of finance by investigating the influence of financial risk on financial performance of commercial banks in Kenya.

For theoretical contributions the study provides a broader view and creates a new insight on influence of financial risk on financial performance for commercial banks in Kenya by analyzing data from various banks for longer period. The study has also underpinned homogeneity assumptions of risk management theory on commercial banks in Kenya. The study provides a simple illustration on the interaction between various types of risks. The study estimates the weight of various risks including credit, liquidity foreign exchange risk, interest rate risk and market risk in trading portfolios to several other risk dimensions. The bank management will find the research findings useful as their management work involve management of their customers and owners fund to generate profits, cash flows and minimizing risk. This exposure is important for them to have information on the categories of risk and the interaction of various types of risk in order to hedge owners fund against risk, hence increasing the value of the firm.

The study explores the relationships between financial risk and performance of banks in Kenya by observing financial risk as value enhancing strategy and recommending to local banks ways to mitigate financial risks and strengthen their financial position hence it provides an opportunity to make an addition in the current literature by validating the control effects of banks size on financial performance of commercial banks in Kenya to generally sustainable profitability.

5.6 Areas for Further Research

This study did not consider banks investments and sources of funding further study should be done on influence of financial risk management on sources of funding and investments. Thus establishing how the mix of funding affects the level of financial risk determining how financing mix impact on financial risk of financial firms, the size of the size of the firm can be taken as a moderating variable.

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

Further research can be done to include non-financial factors, such as ownership structure, physical locations number of customers as moderating variables to determine their moderating effects on the relationship between banks performance and financial risk. Further research can be undertaken to determine future trends and challenges of financial risk management in the digital economy so as to have insight on financial risk issues as the market experienced increased complexity in financial market, increased competition due to removal or weakening of barriers and low cost of financial services.

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APPENDICES

Appendix 1: Commercial Banks in Kenya

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1) Kenya commercial bank ltd
2) Standard charted bank ltd
3) Barclays bank of Kenya ltd
4) Co-operative bank of Kenya ltd
5) CFC Stanbic bank ltd
6) Equity bank ltd
7) Bank of India ltd
8) Bank of Baroda ltd
9) Commercial Bank of Africa Ltd
10) Prime bank ltd
11) National bank of Kenya ltd
12) Citi bank N.A.
13) Bank of Africa ltd
14) NIC bank ltd
15) Guaranty Trust bank ltd
16) I & M Bank ltd
17) Diamond trust ltd
18) Family bank ltd
19) Housing finance corporation ltd
20) Eco bank ltd
21) Habib bank ltd
22) Oriental commercial bank ltd
23) Habib A.G.Ziruch ltd
24) Middle east bank ltd
25) Consolidated bank of Kenya ltd
26) Credit bank ltd
27) Trans-National bank ltd
28) African Banking corporation ltd

29) Giro commercial bank ltd
30) Equatorial bank ltd
31) Paramount universal bank ltd
32) Jamii Bora bank ltd
33) Victoria commercial bank ltd
34) Guardian Bank ltd
35) Development bank of Kenya ltd
36) Fidelity commercial bank ltd
37) K-Rep bank ltd
38) Gulf African bank ltd
39) First community bank ltd
40) UBA Kenya bank ltd.
41) Chase bank ltd (under receivership)
42) Imperial bank ltd(under receivership 13th October 2015)
43) Dubai bank ltd (under liquidation)
44) Charterhouse bank ltd (under statutory management)

Source bank supervision report CBK (2015)

Appendix 2: Letter of Introduction

Name of the Bank……..

P.O. Box ……

Dear Respondent,

I am a student pursuing a Doctorate Degree in Business Administration- Finance Option at Jomo Kenyatta University of Agriculture and Technology. I am required to undertake a research thesis as partial fulfillment for the award of this degree.

You are kindly requested to assist in the collection of secondary data, from your organization to enable me accomplish the study. I have selected your institution as one of the respondents, and kindly request for financial statements for the period 2006 to 2015 The information collected will be treated with utmost confidentiality and will be used solely for the purpose of this research only.

I wish your firm fruitful business.

Yours Sincerely

Maniagi Musiega

0722-479-001

Appendix 3: Tool for Secondary Data

s/n		1	2	3	4	5	6	7	8	9	10
1	Total loans										
2	Non-performing loans										
3	Total assets										
4	Interest income										
5	Capital adequacy ratio										
7	Total deposit										
8	Total advances										
9	Liquid assets										
10	Liquid liabilities										
11	Net profit after tax										
12	Equity										
13	Foreign exchange us dollar.										
15	Non-interest income										
16	Interest rate										
17	Exchange rate against USD										

Appendix: 4 Secondary Raw Data-Total Asset

YEAR	SZ_ABC	SZ_BOA	Siz_Bar	SZ_Ind	SZ_Bar	SZ_Cfc	SZ_Cit	SZ_Cba	SZ_Con	SZ_Coo	SZ_Cre	SZ_Dev	SZ_Dtb	SZ_Equ
2006	6.59E+08	9E+09	1.28E+10	9.54E+09	1.49E+11	3.19E+10	4.48E+10	4.5E+10	4.1E+09	7.72E+10	2.61E+09	3.8E+09	2.62E+10	4.15E+09
2007	6.7E+09	8E+09	1.52E+10	1.06E+10	1.67E+11	2.95E+10	4.85E+10	4.02E+10	5.39E+09	7.53E+10	3.58E+09	5E+09	3.11E+10	5.12E+09
2008	6.83E+09	1E+10	1.88E+10	1.21E+10	1.72E+11	8.55E+10	4.78E+10	5.12E+10	5.54E+09	9.1E+10	3.8E+09	6.63E+09	4.21E+10	4.48E+09
2009	9.12E+09	2E+10	2.24E+10	1.56E+10	1.7E+11	9.84E+10	5.16E+10	5.89E+10	7.57E+09	1.14E+11	3.84E+09	8.29E+09	4.75E+10	4.53E+09
2010	1.03E+10	3E+10	3.23E+10	1.97E+10	1.73E+11	1.07E+11	6.21E+10	6.36E+10	1.05E+10	1.54E+11	4.53E+09	1.07E+10	5.86E+10	1.04E+10
2011	1.25E+10	4E+10	3.67E+10	2.34E+10	1.67E+11	1.4E+11	7.46E+10	8.33E+10	1.53E+10	1.68E+11	5.39E+09	1.15E+10	7.53E+10	1.29E+10
2012	1.91E+10	5E+10	4.61E+10	2.49E+10	1.85E+11	1.33E+11	6.96E+10	1E+11	1.8E+10	2E+11	6.41E+09	1.34E+10	9.45E+10	1.41E+10
2013	1.96E+10	5E+10	5.2E+10	3.07E+10	2.07E+11	1.71E+11	7.12E+10	1.25E+11	1.68E+10	2.29E+11	7.31E+09	1.59E+10	1.14E+11	1.56E+10
2014	2.14E+10	6E+10	6.19E+10	3.44E+10	2.26E+11	1.71E+11	7.94E+10	1.76E+11	1.51E+10	2.83E+11	8.87E+09	1.7E+10	1.41E+11	1.66E+10
2015	2.21E+10	6E+10	6.82E+10	4.22E+10	2.12E+11	1.99E+11	8.81E+10	1.98E+11	1.41E+10	3.4E+11	1.03E+10	1.69E+10	1.91E+11	1.45E+10

SZ_Fid	SZ_Gir	SZ_Gua	SZ_HabA	SZ_Hab	SZ_I&M	SZ_KCB	SZ_Mid	SZ_Nat	SZ_Ori	SZ_Par	SZ_pri	SZ_sta	SZ_Tran	SZ_Vic
2.6E+09	5.7E+09	5.71E+09	5.9E+09	3.9E+09	3.01E+10	1.16E+11	5.16E+09	7.01E+10	2.12E+09	3E+09	1.24E+10	1.14E+11	2.82E+09	4.7E+09
3.45E+09	5.97E+09	6.47E+09	6.44E+09	4.02E+09	3.04E+10	1.25E+11	3.33E+09	5.21E+10	2.37E+09	3.37E+09	1.44E+10	9.3E+10	3.66E+09	4.2E+09
4.4E+09	6.15E+09	6.28E+09	6.62E+09	4.56E+09	3.7E+10	1.82E+11	3.45E+09	4.46E+10	2.77E+09	3.55E+09	2.05E+10	1E+11	3.71E+09	4.47E+09
5.54E+09	7.03E+09	7.32E+09	7.44E+09	4.73E+09	4.45E+10	1.8E+11	3.18E+09	5.23E+10	3.42E+09	3.47E+09	2.42E+10	1.25E+11	3.71E+09	5.13E+09
8.21E+09	1.02E+10	8.03E+09	8.13E+09	5.43E+09	6.26E+10	2.23E+11	4.02E+09	6E+10	4.56E+09	4.42E+09	3.24E+10	1.43E+11	4.76E+09	6.22E+09
1.08E+10	1.18E+10	8.84E+09	8.72E+09	5.86E+09	7.7E+10	2.82E+11	4.64E+09	6.87E+10	5.03E+09	4.73E+09	3.52E+10	1.64E+11	7.29E+09	7.65E+09
1.18E+10	1.23E+10	1.17E+10	9.7E+09	7.01E+09	9.15E+10	3.04E+11	5.87E+09	6.72E+10	6.22E+09	7.26E+09	4.35E+10	1.95E+11	8.8E+09	1.03E+10
1.28E+10	1.36E+10	1.28E+10	1.1E+10	8.08E+09	1.1E+11	3.23E+11	5.77E+09	9.25E+10	7.01E+09	8.03E+09	4.95E+10	2.21E+11	9.66E+09	1.36E+10
1.68E+10	1.51E+10	1.46E+10	1.21E+10	9.45E+09	1.37E+11	3.77E+11	5.94E+09	1.23E+11	7.86E+09	1.04E+10	5.49E+10	1.43E+11	1.02E+10	1.72E+10

1.5E+10	1.59E+10	1.46E+10	1.44E+10	1.02E+10	1.48E+11	4.68E+11	5.68E+09	1.25E+11	8.5E+09	1.05E+10	6.26E+10	2.34E+11	1.05E+10	2E+10

RETURN ON ASSET

YEAR	ROA_ABC	ROA_BOA	ROA_Bar	ROA_Ind	ROA_Bar	ROA_Cfc	ROA_Cit	ROA_Cba	ROA_Con	ROA_Coo	ROA_Cre	ROA_Dev	ROA_Dtb	ROA_Equa
2006	2.1	0.7	2.9	2.9	4.4	2.1	3.4	2.9	0.4	1.6	3.4	3.4	2.6	2.3
2007	2.8	2	3.3	4.5	4.2	3.1	3.7	3.5	0.5	3	3.7	3.1	2.8	1.4
2008	3.3	0.7	3.4	5	4.7	1.5	7	3.3	1.5	3.7	2.1	2.6	3.1	-0.2
2009	2.82	5.3	3.24	3.91	5.3	1.35	-1.26	3	1.54	3.26	2.15	2.27	3.44	1.69
2010	4.67	1.81	5.65	5.04	6.24	1.96	4.64	4.24	2.46	3.61	0.74	2.22	4.9	-0.32
2011	4.12	1.43	4.57	4.81	7.18	2.23	6.43	3.58	1.61	3.68	0.95	1.37	4.19	0.55
2012	2.9	1.3	3.6	2.4	7	3.5	10.4	4	1	3.8	1.3	0.8	4.9	-4.6
2013	2.9	2	4.8	4.1	5.8	4.1	7	3.6	-0.8	4.7	1	1.8	4.9	1
2014	1.49	2.57	4.35	3.74	5.44	4.31	5.22	2.57	-1.82	4.43	-1.02	1.88	4.47	-2.78
2015	1.61	-2.07	3.65	3.49	5.01	3.56	6.33	3.14	3	4.14	-1.74	1.05	3.69	-4.53

ROA_Eqy	ROA_Fid	ROA_Gir	ROA_Gua	ROA_HabA	ROA_Hab	ROA_I&M	ROA_KCB	ROA_Mid	ROA_Nat	ROA_Ori	ROA_Par	ROA_pri	ROA_stC	ROA_StN
4.9	1	1	0.8	2.8	0.1	3.1	2.6	1.9	1.3	-3.1	1	1.5	3.3	1.6
4.3	1.4	0.7	0.4	3.2	2.7	4.3	3.1	2.8	3.1	8.8	1.3	2.2	5.3	2.2
6.1	1.7	2	0.7	3.6	3.2	4.4	3	0.9	4	2.5	1.4	2.3	4.7	3.3
5.66	0.94	2.63	0.83	3.85	4.16	3.94	3.57	1.37	4.13	0.97	1.23	2.33	5.39	2.36
6.95	4.59	6.2	1.39	3.05	4.34	4.8	5.17	5.11	4.49	4.01	6.35	2.37	5.37	3.33
6.84	2.79	2.79	1.92	2.91	4.62	5.8	4.98	1.99	3.56	3.83	2.39	3.07	5.03	4.05
7.4	0.9	1.7	1.9	4.2	6.5	5.2	7.4	0.8	1.7	1.8	1.2	2.7	5.9	3.7
7.7	2.5	2.8	3	4.3	6.2	5.5	5.5	1.4	1.9	2.5	1.2	3.8	6	2.3
7.26	1.8	3.13	2.59	5.29	5.63	5.64	5.93	1.28	1.9	1.07	1.32	4.18	6.42	1.86
6.56	-1.84	3.03	2.25	3.53	4.74	5.66	5.01	0.75	-1.34	0.49	1.6	3.99	3.83	2.39

PROFIT

YEAR	Pf_ABC	Pf_BOA	Pf_Bar	Pf_Ind	Pf_Bar	Pf_Cfc	Pf_Cit	Pf_Cba	Pf_Con	Pf_Coo	Pf_Cre	Pf_Dev	PF_Dtb	PF_Equa
2006	1.38E+09	6E+09	3.71E+10	2.8E+10	6.56E+11	6.69E+10	1.52E+11	1.31E+11	1.64E+09	1.24E+11	8.87E+09	1.29E+10	6.8E+10	9.5E+09
2007	1.88E+10	1.6E+10	5.03E+10	4.8E+10	7.03E+11	9.14E+10	1.8E+11	1.41E+11	2.7E+09	2.26E+11	1.33E+10	1.55E+10	8.72E+10	7.2E+09
2008	2.25E+10	9E+09	6.39E+10	6.1E+10	8.09E+11	1.28E+11	3.35E+11	1.69E+11	8.31E+09	3.37E+11	7.99E+09	1.72E+10	1.3E+11	-9E+08
2009	2.57E+10	9E+10	7.26E+10	6.1E+10	9E+11	1.33E+11	-6.5E+10	1.77E+11	1.17E+10	3.72E+11	8.26E+09	1.88E+10	1.63E+11	7.7E+09
2010	4.81E+10	4.8E+10	1.83E+11	9.9E+10	1.08E+12	2.1E+11	2.88E+11	2.7E+11	2.58E+10	5.56E+11	3.35E+09	2.36E+10	2.87E+11	-3E+09
2011	5.15E+10	5.5E+10	1.68E+11	1.1E+11	1.2E+12	3.12E+11	4.8E+11	2.98E+11	2.47E+10	6.17E+11	5.12E+09	1.58E+10	3.16E+11	7.1E+09
2012	5.53E+10	6.4E+10	1.66E+11	6E+10	1.3E+12	4.67E+11	7.24E+11	4.02E+11	1.8E+10	7.59E+11	8.33E+09	1.07E+10	4.63E+11	-6E+10
2013	5.7E+10	1.1E+11	2.5E+11	1.3E+11	1.2E+12	7E+11	4.99E+11	4.5E+11	-1.3E+10	1.08E+12	7.31E+09	2.86E+10	5.59E+11	1.6E+10
2014	3.19E+10	1.6E+11	2.69E+11	1.3E+11	1.23E+12	7.39E+11	4.14E+11	4.52E+11	-2.7E+10	1.25E+12	-9E+09	3.19E+10	6.31E+11	-5E+10
2015	3.55E+10	-1E+11	2.49E+11	1.5E+11	1.06E+12	7.07E+11	5.58E+11	6.23E+11	4.24E+10	1.41E+12	-1.8E+10	1.78E+10	7.05E+11	-7E+10

Pf_Fid	Pf_Gir	Pf_Gua	Pf_HabA	Pf_Hab	Pf_I&M	Pf_KCB	Pf_Mid	Pf_Nat	Pf_Ori	Pf_Par	Pf_pri	Pf_stC	Pf_StN	Pf_Vic
2.6E+09	5.7E+09	4.57E+09	1.65E+10	3.9E+08	9.32E+10	3.01E+11	9.8E+09	9.12E+10	-6.6E+09	3E+09	1.86E+10	3.77E+11	4.51E+09	1.27E+10
4.82E+09	4.18E+09	2.59E+09	2.06E+10	1.09E+10	1.31E+11	3.86E+11	9.33E+09	1.62E+11	2.08E+10	4.38E+09	3.16E+10	4.93E+11	8.06E+09	1.51E+10
7.47E+09	1.23E+10	4.4E+09	2.38E+10	1.46E+10	1.63E+11	5.46E+11	3.1E+09	1.78E+11	6.94E+09	4.97E+09	4.7E+10	4.72E+11	1.22E+10	1.7E+10
5.21E+09	1.85E+10	6.07E+09	2.86E+10	1.97E+10	1.75E+11	6.43E+11	4.35E+09	2.16E+11	3.32E+09	4.27E+09	5.63E+10	6.73E+11	8.74E+09	2.16E+10
3.77E+10	6.35E+10	1.12E+10	2.48E+10	2.35E+10	3E+11	1.15E+12	2.05E+10	2.7E+11	1.83E+10	2.81E+10	7.69E+10	7.67E+11	1.59E+10	3.11E+10
3.01E+10	3.31E+10	1.7E+10	2.54E+10	2.71E+10	4.46E+11	1.41E+12	9.23E+09	2.44E+11	1.93E+10	1.13E+10	1.08E+11	8.26E+11	2.95E+10	3.29E+10
1.06E+10	2.09E+10	2.23E+10	4.07E+10	4.56E+10	4.76E+11	2.25E+12	4.7E+09	1.14E+11	1.12E+10	8.71E+09	1.17E+11	1.15E+12	3.26E+10	4.96E+10
3.19E+10	3.81E+10	3.85E+10	4.73E+10	5.01E+10	6.07E+11	1.78E+12	8.07E+09	1.76E+11	1.75E+10	9.63E+09	1.88E+11	1.32E+12	2.22E+10	5.87E+10
3.03E+10	4.72E+10	3.77E+10	6.43E+10	5.32E+10	7.74E+11	2.24E+12	7.6E+09	2.33E+11	8.41E+09	1.37E+10	2.3E+11	9.18E+11	1.9E+10	6.35E+10
-2.8E+10	4.81E+10	3.29E+10	5.1E+10	4.85E+10	8.37E+11	2.34E+12	4.26E+09	-1.7E+11	4.16E+09	1.68E+10	2.5E+11	8.97E+11	2.52E+10	6.77E+10
1.97E+10	2E+10	1.43E+10	1.56E+10	1.87E+10	2.72E+11	8.14E+11	5.01E+09	1.26E+11	8.78E+09	7.65E+09	8.32E+10	3.02E+11	9.54E+09	2.12E+10

RETURN ON EQUITY

YEAR	ROE_ABC	ROE_BOA	ROE_Bar	ROE_Ind	ROE_Bar	ROE_Cfc	ROE_Cit	ROE_Cba	ROE_Con	ROE_Coo	ROE_Cre	ROE_Dev	ROE_Dtb	ROE_Equ
2006	20.66	6.27	29.5	44.97	44.57	22.7	24.46	36.1	2.25	25.64	17.6	11.92	26.21	15.24
2007	22.77	12.5	32.44	36.09	40.3	27.59	24.31	31.03	3.45	33.61	23.29	13.76	18.61	10.89
2008	23.2	5.6	33.1	36	39.2	18.4	36.5	34.2	10	23.9	11.9	13.9	24.5	-1.2
2009	22.45	10.35	28.3	29.43	48.71	16.37	-2.22	27.96	12.12	23.14	11.4	13.79	26.09	10.55
2010	29.46	16.45	38.52	35.94	34.25	20.96	22.34	36.06	17.45	27.52	3.55	15.85	35.64	-3.7
2011	20.28	11.87	33.96	28.87	41.11	30.82	31.77	30.04	17.18	29.41	5.35	10.08	31.34	5.91
2012	26.4	12.7	28.9	24.9	44	26	41.7	34.3	11.2	33.1	6.9	6.3	31.4	-9.08
2013	23.6	15.7	33.1	24.6	36.8	31.3	31.2	32.5	-11.5	30	5.9	15	30	11.1
2014	12.11	0.33	27.3	21.1	32.3	27.7	22.6	25.3	-17.5	29.5	-17.5	11.5	24.5	-39.9
2015	12.5	-16.9	22	20.5	30.4	25.1	28.7	27.4	0.35	28.5	-12.8	6.3	32.5	-31.7

Roe_Equ	Roe_Fid	Roe_Gir	Roe_Gua	Roe_HabA	Roe_Hab	Roe_I&M	Roe_KCB	Roe_Mid	Roe_Nat	Roe_Ori	Roe_Par	Roe_pri	ROE_StC	Roe_StN	Roe_Vic
49.99	9.12	11.92	6.12	25.4	1.25	33.5	26.44	11.87	24.28	-9.67	7.24	14.51	37.83	4.12	21.93
15.85	15.27	7.78	3.1	27.51	20.44	33.47	30.07	10.69	32.41	25.54	9.47	16.45	45.27	7.32	22.99
24.2	17.1	20.7	5.3	31.2	23.6	31.2	26.9	3.4	28.9	7.2	10.4	15	41.3	9.8	22.3
23.87	10.61	21.59	6.99	29.85	26.7	23.61	28.69	4.87	27.3	3.36	7.97	18.4	48.71	6.64	23.1
32.9	46.99	47.35	11.77	22.15	26.24	23.15	28.23	20.01	27.17	16.07	35.78	19.74	47.94	10.29	28.19
34.53	29.64	20.9	15.94	19.82	25.51	32.17	31.18	8.4	23.37	14.93	11	28.88	40.11	16.92	26.32
37.6	8.6	11.7	18.3	26.9	33.8	28.5	37.6	4.2	11	8.2	7.9	27.8	37.6	17.6	24.1
36	22.4	18.4	25.7	25.7	30	29.5	28.4	6.9	15	11.7	8.1	32.5	37	12	23.2
49.4	17.3	19.5	21.5	28.6	27.4	35.5	31	6.2	19.2	5.3	9.9	29.7	35.4	10	22.1
47.2	-15.9	16.9	16.6	19.8	22.6	32	29	3.4	-15.4	1.9	11	29.7	21.9	12.4	19.3

(SD) FOREIGN EXCHANGE

YEAR	FXR
2006	1.111416946
2007	1.717660567
2008	5.799555133
2009	1.903914549
2010	1.987654542
2011	6.17642926
2012	1.174083688
2013	1.214809706
2014	1.384941997
2015	4.856127023

NPL RATIO

YEAR	CR3_ABC	CR3_BOA	CR3_Bar	CR3_Ind	CR3_Bar	CR3_Cfc	CR3_Cit	CR3_Cba	CR3_Con	CR3_Coo	CR3_Cre	CR3_Dev	CR3_Dtb	CR3_Equ	CR3_Eqy
2006	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213
2007	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064
2008	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923
2009	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
2010	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063
2011	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
2012	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
2013	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
2014	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056
2015	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068

CR3_Fid	CR3_Gir	CR3_Gua	CR3_HabA	CR3_Hab	CR3_I&M	CR3_KCB	CR3_Mid	CR3_Nat	CR3_Ori	CR3_Par	CR3_Pri	CR3_StC	CR3_TrN	CR3_Vic
0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213
0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064	0.1064
0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063
0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056
0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068

CAPITAL ADEQUACY= total capital/ total risk weighted assets

YEAR	CR2_ABC	CR2_BOA	CR2_Bar	CR2_Ind	CR2_Bar	CR2_Cfc	CR2_Cit	CR2_Cba	CR2_Con	CR2_Coo	CR2_Cre	CR2_Dev	CR2_Dtb	CR2_Equa	CR2_Equ
2006	17.51	16.9	27.53	25.14	12.12	18.29	26.6	15.29	21.47	14.56	23.23	53.21	20.65	21.02	13.86
2007	17.16	14.41	18.94	28.48	13.99	19.13	27.14	14.1	18.87	14.51	30.02	39.58	19.14	20.29	58.93
2008	21.36	13.19	19.71	32.09	18.75	14.65	26	13.02	18.65	23.48	28.85	31.58	19.77	21.07	40.77
2009	20.69	15.92	20.56	34.66	23.83	16.04	29.89	12.85	15.69	21.01	33.38	26.36	18.97	20.77	31.49
2010	20.13	15.17	23.61	43.24	31.15	16.2	36.03	14.51	13.18	16.54	37.58	27.18	18.43	14.49	27.88
2011	17.6	16	21.4	46.41	27.81	19.04	31.48	14.54	12.65	16.42	30.01	27.08	16.79	14.27	21.67
2012	14.4	13.2	23.5	40.5	25.8	25.5	41.8	16.1	15	23.8	30.7	24.9	19.8	8.9	30.1
2013	15.1	12.7	21.6	41.5	17.3	21	35.4	13.5	10.8	21.1	26.6	23.6	21	12.3	23.6
2014	17.2	15.9	24.2	39.4	18.7	22	27.3	17.9	11	21.6	18.8	29.6	18.9	10.7	17.7
2015	16.5	16.4	27.7	42.3	18.4	18.7	28.3	17.9	9.4	21.3	15.7	27.3	17.7	17.5	16.2

CR2_Fid	CR2_Gir	CR2_Gua	CR2_HabA	CR2_Hab	CR2_I&M	CR2_KCB	CR2_Mid	CR2_Nat	CR2_Ori	CR2_Par	CR2_pri	CR2_stC	CR2_StN	CR2_Vic
16.15	17.2	22.61	38.82	57.58	12.86	15.75	31.33	11.88	59.8	32.46	13	18.88	65.43	23.09
14.51	17.08	23.75	35.73	46.29	14.44	13.61	39.43	38.67	60.34	32.46	13.94	16.71	60.8	24.53
14.04	18.78	23.34	29.1	47.65	12.65	15.45	43.25	39.91	54.26	41.97	16.05	16.2	66.25	22.94
14.55	23.35	19.36	33.65	65.67	18.71	14.82	50.64	42.56	40.31	34.04	15.74	14.46	71.64	23.02
17.49	24.87	19.29	40.28	41.72	19.92	23.16	52.53	36.92	35.99	47.44	13.76	14.32	70.62	23.5
15.21	23.71	18.23	37.48	33.58	19.28	20.69	43.57	29.18	35.28	53.99	16.51	14.3	46.87	21.99
18.5	29.5	17.3	56.9	42.1	17.3	22.7	40.3	28.4	30.2	47.5	17	18	38.7	25.1
18.5	28.9	18	33.2	37.1	19	22.5	36.3	24.1	30.4	41.9	18.4	20.8	31.4	19.8
16.4	23.8	16.6	37.2	32.8	18.9	21	58.6	13.9	25.6	25.5	16.8	19.8	21.7	19.2
16.5	24.1	17.6	26.9	37.2	19.2	15.4	33.1	14	34.2	24.1	17.3	21.2	21.5	19.3

LOANS TO DEPOSIT

YEAR	CR1_ABC	CR1_BOA	CR1_Bar	CR1_Ind	CR1_Bar	CR1_Cfc	CR1_Cit	CR1_Cba	CR1_Con	CR1_Coo	CR1_Cre	CR1_Dev	CR1_Dtb	CR1_Equa	CR1_Equ
2006	0.696	0.765	0.432	0.452	0.788	0.813	0.487	0.437	0.667	0.582	0.726	1.167	0.827	0.735	0.669
2007	0.657	0.829	0.543	0.414	0.966	0.800	0.426	0.481	0.787	0.702	0.614	1.526	0.809	0.560	0.692
2008	0.662	0.787	0.589	0.436	0.855	0.718	0.582	0.631	0.839	0.809	0.652	1.541	0.756	0.629	0.834
2009	0.554	0.735	0.487	0.418	0.742	0.807	0.644	0.779	0.791	0.680	0.673	1.978	0.980	0.781	0.910
2010	0.633	0.989	0.525	0.424	0.704	0.810	0.057	0.726	0.755	0.698	0.593	1.194	0.891	0.367	0.822
2011	0.675	0.903	0.633	0.391	0.798	0.864	0.049	0.704	0.766	0.767	0.725	1.415	1.024	0.645	0.935
2012	0.642	0.851	0.571	0.397	0.756	0.875	0.052	0.664	0.756	0.734	0.651	0.997	0.827	0.655	0.967
2013	0.682	0.870	0.563	0.469	0.783	0.722	0.055	0.778	0.927	0.784	0.785	0.963	0.889	0.667	1.081
2014	0.842	0.790	0.596	0.504	0.725	0.878	0.434	0.760	0.968	0.827	0.804	0.864	0.933	0.806	0.953
2015	1.006	0.773	0.610	0.674	0.788	0.949	0.446	0.726	0.984	0.798	0.982	0.777	1.013	1.003	0.968

CR1_Fid	CR1_Gir	CR1_Gua	CR1_HabA	CR1_Hab	CR1_I&M	CR1_KCB	CR1_Mid	CR1_Nat	CR1_Ori	CR1_Par	CR1_pri	CR1_StC	CR1_StN	CR1_Vic
0.723	0.674	0.741	0.299	0.325	0.807	0.569	0.848	0.925	0.565	0.531	0.589	0.551	1.032	0.593
0.734	0.625	0.724	0.329	0.342	0.831	0.659	0.991	0.179	0.628	0.561	0.608	0.535	0.671	0.696
0.738	0.665	0.775	0.499	0.327	0.913	0.722	0.817	0.261	0.789	0.601	0.602	0.563	0.771	0.775
0.674	0.620	0.716	0.449	0.356	0.707	0.700	0.855	0.313	0.755	0.532	0.553	0.653	0.910	0.779
0.624	0.594	0.799	0.330	0.516	1.225	0.842	0.740	0.436	0.750	0.438	0.582	0.613	0.638	0.729
0.690	0.632	0.798	0.363	0.521	1.511	0.853	0.792	0.495	0.772	0.528	0.637	0.796	0.626	0.696
0.631	0.530	0.690	0.361	0.558	1.185	0.837	0.576	0.514	0.728	0.443	0.665	0.815	1.203	0.700
0.644	0.603	0.770	0.384	0.639	1.315	0.836	0.577	0.507	0.758	0.496	0.660	0.853	0.716	0.925
0.736	0.625	0.814	0.386	1.385	1.046	0.931	0.660	0.652	0.815	0.671	0.201	0.795	0.863	0.893
0.928	0.733	0.797	0.529	0.623	0.998	0.924	0.980	0.657	0.898	2.061	0.643	0.704	0.970	0.936

LOANS TO ASSETS

YEAR	IR1_ABC	IR1_BOA	IR1_Bar	IR1_Ind	IR1_Bar	IR1_Cfc	IR1_Cit	IR1_Cba	IR1_Con	IR1_Coo	IR1_Cre	IR1_Dev	IR1_Dtb	IR1_Equa	IR1_Eqty
2006	0.431	0.443	0.341	0.339	0.496	0.472	0.275	0.316	0.400	0.363	0.545	0.415	0.529	0.582	0.488
2007	0.499	0.566	0.452	0.336	0.629	0.567	0.260	0.399	0.416	0.511	0.456	0.496	0.635	0.451	0.400
2008	0.520	0.535	0.476	0.366	0.628	0.517	0.379	0.513	0.496	0.585	0.476	0.518	0.605	0.515	0.524
2009	0.438	0.537	0.406	0.349	0.550	0.457	0.415	0.585	0.511	0.545	0.490	0.575	0.645	0.607	0.608
2010	0.514	0.733	0.416	0.347	0.505	0.551	0.035	0.608	0.577	0.563	0.425	0.460	0.683	0.284	0.585
2011	0.566	0.558	0.522	0.310	0.592	0.459	0.031	0.569	0.600	0.652	0.529	0.512	0.676	0.490	0.643
2012	0.514	0.610	0.475	0.292	0.563	0.496	0.033	0.529	0.560	0.596	0.486	0.517	0.634	0.602	0.629
2013	0.553	0.591	0.453	0.347	0.572	0.405	0.034	0.567	0.647	0.599	0.592	0.510	0.660	0.594	0.719
2014	0.630	0.631	0.468	0.362	0.567	0.524	0.309	0.527	0.714	0.642	0.664	0.550	0.675	0.697	0.696
2015	0.719	0.660	0.473	0.426	0.702	0.521	0.314	0.543	0.718	0.626	0.718	0.537	0.672	0.719	0.672

IR1_Fid	IR1_Gir	IR1_Gua	IR1_HabA	IR1_Hab	IR1_I&M	IR1_KCB	IR1_Mid	IR1_Nat	IR1_Ori	IR1_Par	IR1_pri	IR1_StC	IR1_StN	IR1_Vic
0.550	0.531	0.518	0.220	0.203	0.489	0.352	0.384	0.378	0.195	0.309	0.393	0.313	0.462	0.461
0.585	0.514	0.509	0.256	0.232	0.632	0.454	0.566	0.151	0.218	0.312	0.438	0.425	0.330	0.569
0.634	0.554	0.565	0.330	0.217	0.699	0.436	0.479	0.201	0.345	0.357	0.461	0.431	0.393	0.621
0.595	0.524	0.563	0.292	0.265	0.553	0.536	0.510	0.251	0.444	0.391	0.439	0.454	0.456	0.619
0.548	0.482	0.694	0.271	0.374	0.901	0.616	0.465	0.347	0.538	0.353	0.457	0.431	0.407	0.579
0.607	0.537	0.690	0.277	0.420	1.118	0.637	0.461	0.409	0.567	0.410	0.523	0.593	0.454	0.538
0.564	0.449	0.609	0.289	0.413	0.850	0.615	0.383	0.422	0.563	0.378	0.500	0.586	0.482	0.513
0.568	0.507	0.670	0.291	0.439	0.888	0.614	0.538	0.428	0.582	0.408	0.541	0.598	0.533	0.613
0.621	0.516	0.707	0.283	0.498	0.664	0.683	0.626	0.554	0.646	0.518	0.638	0.900	0.645	0.637
0.668	0.592	0.679	0.369	0.417	0.705	0.740	0.706	0.581	0.657	0.616	0.665	0.525	0.697	0.656

INTEREST INCOME TO TOTAL DEPOSITS

YEAR	IR2_ABC	IR2_BOA	IR2_Bar	IR2_Ind	IR2_Bar	IR2_Cfc	IR2_Cit	IR2_Cba	IR2_Con	IR2_Coo	IR2_Cre	IR2_Dev	IR2_Dtb	IR2_Equ	IR2_Eqty
2006	0.062	0.029	0.109	0.084	0.040	0.051	0.066	0.030	0.063	0.043	13.966	0.053	0.111	0.835	0.067
2007	0.061	0.041	0.094	0.078	0.037	0.059	0.071	0.035	0.059	0.060	10.650	0.049	0.101	0.831	0.049
2008	0.067	0.059	0.079	0.073	0.041	0.035	0.074	0.029	0.066	0.063	11.078	0.038	0.085	0.726	0.076
2009	0.061	0.064	0.071	0.059	0.043	0.033	0.070	0.025	0.068	0.062	12.844	0.033	0.082	0.665	0.084
2010	0.067	0.056	0.052	0.050	0.047	0.043	0.059	0.024	0.059	0.062	12.962	0.027	0.070	0.803	0.083
2011	0.060	0.055	0.062	0.047	0.098	0.038	0.051	0.019	0.045	0.074	11.664	0.029	0.063	0.690	0.088
2012	0.040	0.033	0.047	0.056	0.098	0.049	0.060	0.016	0.040	0.080	9.895	0.020	0.071	0.744	0.102
2013	0.064	0.041	0.059	0.046	0.091	0.044	0.061	0.017	0.064	0.069	10.915	0.035	0.070	0.794	0.099
2014	0.064	0.037	0.054	0.043	0.087	0.049	0.057	0.031	0.061	0.068	10.262	0.036	0.060	0.810	0.094
2015	0.062	0.040	0.054	0.043	0.095	0.047	0.052	0.033	0.080	0.068	10.540	0.027	0.056	0.724	0.086

IR2_Fid	IR2_Giro	IR2_Gua	IR2_HabA	IR2_Hab	IR2_I&M	IR2_KCB	IR2_Mid	IR2_Nat	IR2_Ori	IR2_Par	IR2_pri	IR2_stC	IR2_StN	IR2_Vic
0.115	0.066	0.039	0.131	0.071	0.041	0.058	0.033	0.033	0.032	0.022	0.060	0.036	0.095	0.069
0.087	0.067	0.037	0.146	0.070	0.056	0.062	0.052	0.048	0.033	0.020	0.058	0.053	0.075	0.088
0.078	0.070	0.041	0.175	0.068	0.056	0.058	0.052	0.066	0.030	0.023	0.047	0.059	0.075	0.087
0.066	0.071	0.050	0.183	0.069	0.053	0.069	0.064	0.064	0.027	0.026	0.043	0.059	0.090	0.082
0.048	0.051	0.051	0.229	0.079	0.060	0.083	0.057	0.073	0.032	0.022	0.035	0.065	0.073	0.072
0.037	0.047	0.054	0.291	0.087	0.072	0.075	0.050	0.074	0.039	0.023	0.046	0.069	0.073	0.062
0.040	0.048	0.044	0.297	0.080	0.072	0.091	0.043	0.071	0.019	0.017	0.035	0.062	0.063	0.064
0.044	0.052	0.057	0.379	0.077	0.064	0.009	0.045	0.061	0.043	0.039	0.050	0.069	0.072	0.057
0.036	0.048	0.059	0.357	0.069	0.061	0.091	0.046	0.055	0.039	0.032	0.054	0.125	0.076	0.049
0.043	0.052	0.047	0.393	0.070	0.068	0.076	0.051	0.051	0.039	0.053	0.054	0.083	0.082	0.053

LIQUID ASSET TO TOTAL ASSET

YEAR	LQ1_ABC	LQ1_BOA	LQ1_Bar	LQ1_Ind	LQ1_Bar	LQ1_Cfc	LQ1_Cit	LQ1_Cba	LQ1_Con	LQ1_Coo	LQ1_Cre	LQ1_Dev	LQ1_Dtb	LQ1_Equa	LQ1_Equ
2006	0.677	0.752	0.828	0.874	0.738	0.889	0.745	0.894	0.693	0.711	0.705	0.668	0.770	0.835	0.829
2007	0.748	0.934	0.856	0.839	0.719	0.822	0.833	0.807	0.648	0.826	0.653	0.730	0.849	0.831	0.924
2008	0.787	0.946	0.887	0.835	0.912	0.373	0.878	0.785	0.728	0.873	0.852	0.737	0.863	1.173	0.934
2009	0.827	0.985	0.902	0.852	0.715	0.589	0.917	0.759	0.831	0.918	0.818	1.036	0.784	1.352	0.928
2010	0.821	0.987	0.938	0.835	0.972	0.907	0.875	0.856	0.886	0.959	0.903	0.869	0.855	0.803	0.957
2011	0.841	0.986	0.996	0.872	0.976	0.714	0.835	0.886	0.935	0.948	0.903	0.835	0.934	0.690	0.966
2012	0.888	0.988	0.997	0.837	0.986	0.832	0.778	0.969	0.951	0.955	0.827	0.839	0.960	0.744	0.970
2013	0.941	0.988	0.997	0.837	0.987	0.635	0.891	0.801	0.947	0.954	0.880	0.781	0.968	0.794	0.971
2014	0.874	0.986	0.998	0.879	0.988	0.883	0.967	0.825	0.938	0.967	0.792	0.991	0.753	0.810	0.970
2015	0.869	1.002	0.997	0.952	0.949	0.585	0.889	0.818	0.881	0.977	0.909	0.986	0.880	0.724	0.974

LQ1_Fid	LQ1_Gir	LQ1_Gua	LQ1_HabA	LQ1_Hab	LQ1_I&M	LQ1_KCB	LQ1_Mid	LQ1_Nat	LQ1_Ori	LQ1_Par	LQ1_pri	LQ1_stC	LQ1_StN	LQ1_Vic
0.819	0.768	0.912	0.864	0.579	0.710	0.866	0.915	0.763	0.947	0.950	0.977	0.800	0.801	0.858
0.827	0.826	0.917	0.955	0.905	0.932	0.931	9.037	0.928	0.904	0.926	0.977	0.969	0.764	0.908
0.737	0.964	0.957	0.936	0.906	0.962	0.964	0.903	0.922	0.872	0.943	0.961	0.972	0.846	0.945
0.773	0.975	0.945	0.955	0.899	0.958	0.946	0.951	0.943	0.912	0.923	0.834	0.973	0.887	0.945
0.783	0.986	0.972	0.978	0.947	0.980	0.944	0.958	0.957	0.991	0.930	0.968	0.976	0.982	9.853
0.991	0.983	0.904	9.668	0.908	0.982	0.980	0.931	9.538	0.988	0.914	0.991	0.914	0.990	0.981
0.988	0.980	0.987	0.943	0.904	0.985	0.985	0.923	0.963	0.991	0.992	0.988	0.882	0.990	0.986
0.941	0.982	0.989	0.931	0.945	0.982	0.983	0.959	0.958	0.987	0.993	0.989	0.889	0.991	0.990
0.964	0.985	0.991	0.917	0.954	0.995	0.849	0.968	0.963	0.991	0.991	0.917	1.398	0.988	0.989
0.980	0.983	1.008	0.868	0.902	0.995	0.787	0.942	0.967	0.989	0.993	0.965	0.940	0.980	0.988

LIQUID ASSET TO TOTAL DEPOSIT

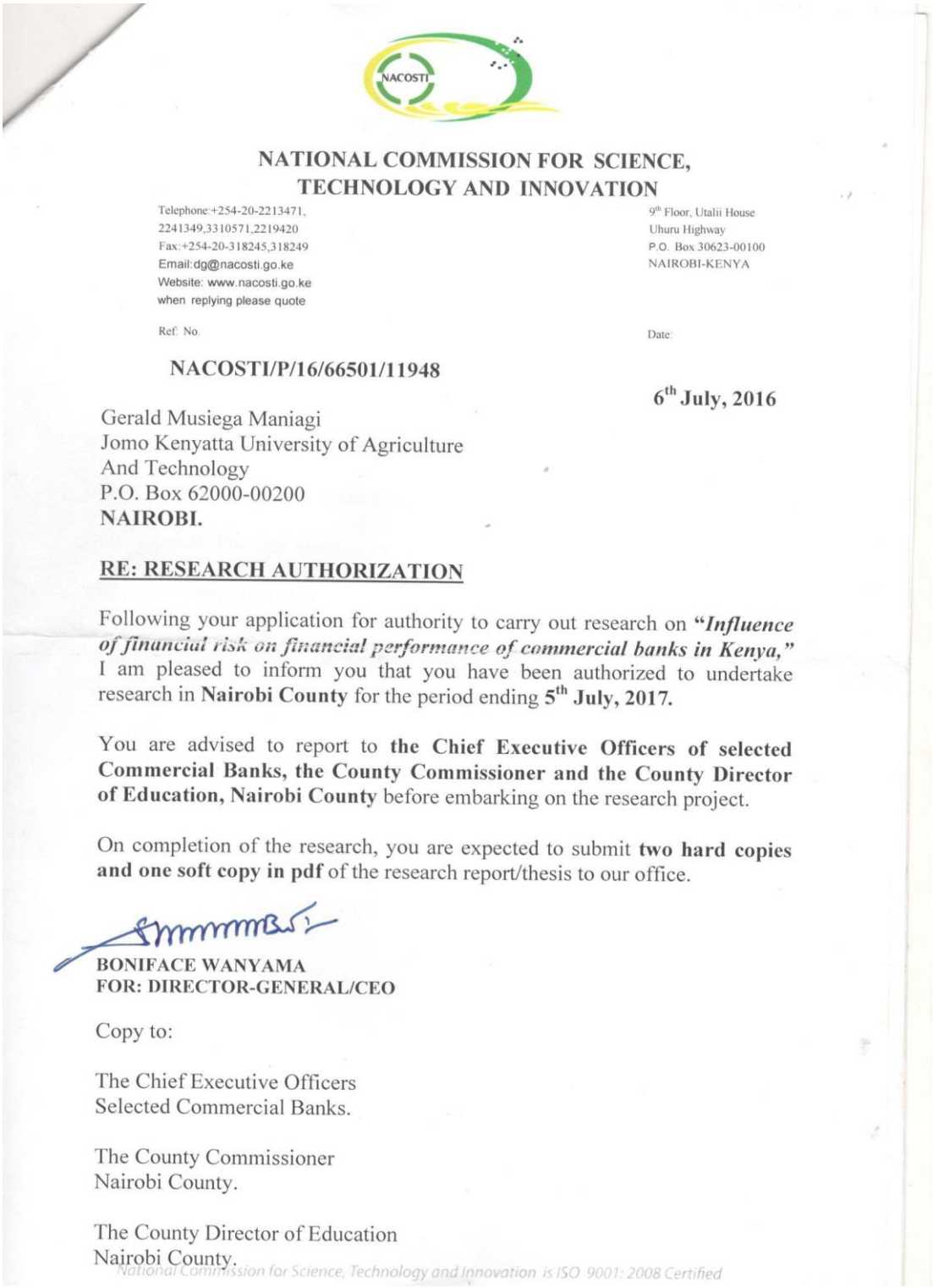
YEAR	LQ1_ABC	LQ1_BOA	LQ1_Bar	LQ1_Ind	LQ1_Bar	LQ1_Cfc	LQ1_City	LQ1_Cba	LQ1_Con	LQ1_Coo	LQ1_Cre	LQ1_Dev	LQ1_Dtb	LQ1_Equ	LQ1_Equ
2006	1.093	1.297	1.047	1.167	1.173	1.532	1.319	1.238	1.153	1.139	0.939	1.880	1.205	1.055	1.136
2007	0.986	1.369	1.029	1.034	1.104	1.160	1.366	0.972	1.226	1.136	0.881	2.248	1.083	1.032	1.600
2008	1.001	1.393	1.099	0.993	1.242	0.519	1.346	0.964	1.231	1.207	1.168	2.192	1.078	1.431	1.488
2009	1.046	1.348	1.084	1.022	0.965	1.041	1.423	1.009	1.287	1.146	1.124	3.563	1.191	1.738	1.387
2010	1.012	1.332	1.185	1.021	1.356	1.335	1.421	1.024	1.159	1.191	1.259	2.253	1.116	1.039	1.347
2011	1.005	1.595	1.208	1.102	1.314	1.346	1.339	1.096	1.192	1.115	1.237	2.306	1.414	0.907	1.403
2012	1.110	1.378	1.198	1.140	1.323	1.466	1.230	1.216	1.285	1.175	1.109	1.618	1.251	0.810	1.492
2013	1.162	1.455	1.239	1.129	1.351	1.132	1.450	1.100	1.357	1.249	1.167	1.475	1.304	0.891	1.459
2014	1.167	1.235	1.270	1.224	1.262	1.480	1.359	1.189	1.271	1.246	0.959	1.556	1.041	0.937	1.327
2015	1.216	1.173	1.285	1.505	1.066	1.065	1.261	1.095	1.207	1.244	1.243	1.427	1.327	1.009	1.403

LQ1_Fid	LQ1_Gir	LQ1_Gua	LQ1_HabA	LQ1_Hab	LQ1_I&M	LQ1_KCB	LQ1_Mid	LQ1_Nat	LQ1_Ori	LQ1_Par	LQ1_pri	LQ1_StC	LQ1_StN	LQ1_Vic
1.077	0.975	1.304	1.173	0.929	1.171	1.400	2.019	1.869	2.745	1.633	1.463	1.408	1.788	1.103
1.037	1.003	1.305	1.227	1.333	1.225	1.354	15.820	1.105	2.600	1.664	1.355	1.220	1.556	1.111
0.858	1.157	1.311	1.418	1.366	1.256	1.597	1.541	1.199	1.993	1.588	1.255	1.270	1.660	1.178
0.876	1.152	1.200	1.467	1.206	1.225	1.234	1.596	1.175	1.551	1.256	1.051	1.399	1.769	1.191
0.892	1.215	1.120	1.192	1.307	1.333	1.289	1.524	1.202	1.383	1.154	1.231	1.387	1.539	12.408
1.127	1.156	1.045	12.659	1.128	1.327	1.314	1.598	11.545	1.346	1.176	1.208	1.227	1.366	1.270
1.105	1.155	1.117	1.181	1.220	1.373	1.340	1.387	1.172	1.283	1.164	1.313	1.227	2.471	1.346
1.068	1.168	1.135	1.230	1.373	1.455	1.340	1.028	1.136	1.286	1.208	1.206	1.268	1.333	1.493
1.142	1.193	1.142	1.248	2.653	1.568	1.158	1.020	1.133	1.250	1.284	0.289	1.235	1.322	1.388
1.362	1.218	1.183	1.244	1.345	1.408	0.983	1.308	1.093	1.351	3.320	0.452	1.261	1.363	1.411

Market Risk

YEAR	MR_ABC	MR_BOA	MR_Bar	MR_Ind	MR_Bar	MR_Cfc	MR_Cit	MR_Cba	MR_Con	MR_Coo	MR_Cre	MR_Dev	MR_Dtb	MR_Equ
2006	-5.8717E+19	-2.5E+20	-1.6E+21	-1.2E+21	-2.8E+22	-2.8E+21	-6.5E+21	-5.5E+21	-7E+19	-5.2E+21	-3.8E+20	-5.5E+20	-2.9E+21	-4E+20
2007	-7.95841E+20	-6.9E+20	-2.1E+21	-2E+21	-3E+22	-3.9E+21	-7.6E+21	-6E+21	-1.1E+20	-9.6E+21	-5.6E+20	-6.6E+20	-3.7E+21	-3E+20
2008	-9.55595E+20	-3.8E+20	-2.7E+21	-2.6E+21	-3.4E+22	-5.4E+21	-1.4E+22	-7.2E+21	-3.5E+20	-1.4E+22	-3.4E+20	-7.3E+20	-5.5E+21	3.8E+19
2009	-1.09079E+21	-3.8E+21	-3.1E+21	-2.6E+21	-3.8E+22	-5.6E+21	2.76E+21	-7.5E+21	-4.9E+20	-1.6E+22	-3.5E+20	-8E+20	-6.9E+21	-3.2E+20
2010	-2.03996E+21	-2.1E+21	-7.7E+21	-4.2E+21	-4.6E+22	-8.9E+21	-1.2E+22	-1.1E+22	-1.1E+21	-2.4E+22	-1.4E+20	-1E+21	-1.2E+22	1.41E+20
2011	-2.18597E+21	-2.3E+21	-7.1E+21	-4.8E+21	-5.1E+22	-1.3E+22	-2E+22	-1.3E+22	-1E+21	-2.6E+22	-2.2E+20	-6.7E+20	-1.3E+22	-3E+20
2012	-2.3462E+21	-2.7E+21	-7E+21	-2.5E+21	-5.5E+22	-2E+22	-3.1E+22	-1.7E+22	-7.6E+20	-3.2E+22	-3.5E+20	-4.6E+20	-2E+22	2.75E+21
2013	-2.41608E+21	-4.5E+21	-1.1E+22	-5.3E+21	-5.1E+22	-3E+22	-2.1E+22	-1.9E+22	5.69E+20	-4.6E+22	-3.1E+20	-1.2E+21	-2.4E+22	-6.6E+20
2014	-1.35514E+21	-6.8E+21	-1.1E+22	-5.5E+21	-5.2E+22	-3.1E+22	-1.8E+22	-1.9E+22	1.16E+21	-5.3E+22	3.84E+20	-1.4E+21	-2.7E+22	1.96E+21
2015	-1.50656E+21	5.46E+21	-1.1E+22	-6.2E+21	-4.5E+22	-3E+22	-2.4E+22	-2.6E+22	-1.8E+21	-6E+22	7.59E+20	-7.5E+20	-3E+22	2.78E+21
MR_Eqy	**MR_Fidel**	**MR_Giro**	**MR_Gua**	**MR_HabA**	**MR_Hab**	**MR_I&M**	**MR_KCB**	**MR_Mid**	**MR_Nat**	**MR_Orie**	**MR_Para**	**MR_prim**	**MR_stD**	**MR_Stan**
-4.7E+21	-1.10298E+20	-2.4E+20	-1.9E+20	-7E+20	-1.7E+19	-4E+21	-1.3E+22	-4.2E+20	-3.9E+21	2.79E+20	-1.3E+20	-7.9E+20	-1.6E+22	-1.9E+20
-1E+22	-2.04662E+20	-1.8E+20	-1.1E+20	-8.7E+20	-4.6E+20	-5.5E+21	-1.6E+22	-4E+20	-6.9E+21	-8.8E+20	-1.9E+20	-1.3E+21	-2.1E+22	-3.4E+20
-2E+22	-3.17102E+20	-5.2E+20	-1.9E+20	-1E+21	-6.2E+20	-6.9E+21	-2.3E+22	-1.3E+20	-7.6E+21	-2.9E+20	-2.1E+20	-2E+21	-2E+22	-5.2E+20
-2.4E+22	-2.20878E+20	-7.8E+20	-2.6E+20	-1.2E+21	-8.3E+20	-7.4E+21	-2.7E+22	-1.8E+20	-9.2E+21	-1.4E+20	-1.8E+20	-2.4E+21	-2.9E+22	-3.7E+20
-3.9E+22	-1.59844E+21	-2.7E+21	-4.7E+20	-1.1E+21	-1E+21	-1.3E+22	-4.9E+22	-8.7E+20	-1.1E+22	-7.8E+20	-1.2E+21	-3.3E+21	-3.3E+22	-6.7E+20
-5.1E+22	-1.27697E+21	-1.4E+21	-7.2E+20	-1.1E+21	-1.1E+21	-1.9E+22	-6E+22	-3.9E+20	-1E+22	-8.2E+20	-4.8E+20	-4.6E+21	-3.5E+22	-1.3E+21
-6.8E+22	-4.49455E+20	-8.9E+20	-9.5E+20	-1.7E+21	-1.9E+21	-2E+22	-9.5E+22	-2E+20	-4.8E+21	-4.7E+20	-3.7E+20	-5E+21	-4.9E+22	-1.4E+21
-7.8E+22	-1.35528E+21	-1.6E+21	-1.6E+*21*	-2E+21	-2.1E+21	-2.6E+22	-7.5E+22	-3.4E+20	-7.5E+21	-7.4E+20	-4.1E+20	-8E+21	-5.6E+22	-9.4E+20
-8.5E+22	-1.28628E+21	-2E+21	-1.6E+21	-2.7E+21	-2.3E+21	-3.3E+22	-9.5E+22	-3.2E+20	-9.9E+21	-3.6E+20	-5.8E+20	-9.7E+21	-3.9E+22	-8.1E+20
-9.5E+22	1.17281E+21	-2E+21	-1.4E+21	-2.2E+21	-2.1E+21	-3.5E+22	-9.9E+22	-1.8E+20	7.12E+21	-1.8E+20	-7.1E+20	-1.1E+22	-3.8E+22	-1.1E+21

Appendix 5: Research Permit



NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION

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NAIROBI-KENYA

Ref: No.

Date:

NACOSTI/P/16/66501/11948

6th July, 2016

Gerald Musiega Maniagi
Jomo Kenyatta University of Agriculture
And Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Influence of financial risk on financial performance of commercial banks in Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **5th July, 2017.**

You are advised to report to **the Chief Executive Officers of selected Commercial Banks, the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Chief Executive Officers
Selected Commercial Banks.

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

National Commission for Science, Technology and Innovation is ISO 9001: 2008 Certified

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 9974

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MR. GERALD MUSIEGA MANIAGI
of JKUAT, 190-50100 KAKAMEGA,has been permitted to conduct research in ***Nairobi County***

on the topic: ***INFLUENCE OF FINANCIAL RISK ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA.***

for the period ending:
5th July,2017

Permit No : NACOSTI/P/16/66501/11948
Date Of Issue : 6th July,2016
Fee Recieved :Ksh 2000

Applicant's Signature

Director General
National Commission for Science, Technology & Innovation