

**INFLUENCE OF FINANCIAL RISK ON STOCK
RETURNS OF COMMERCIAL BANKS LISTED IN
NAIROBI SECURITIES EXCHANGE**

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Listed in Nairobi Securities Exchange**

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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 Almighty God, my mother Jane Wambui and my wife Esther Waithera for their encouragement and support during the entire duration of this research report. I also dedicate to my children; Jobroy Mwaurah and Janetrix Wambui to whom this work will serve as a source of great inspiration and motivation as they grow up.

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LIST OF ABBREVIATIONS AND ACRONYMS

AEO:	African Economic Outlook
ADF:	Augmented Dickey Fuller
AGM:	Annual General Meeting
ANOVA:	Analysis of Variance
APT:	Arbitrage Pricing Theory
ARCH:	Autoregressive Conditional Heteroscedasticity
ARIMA:	Autoregressive Integrated Moving Average
ASEAN:	Association of South East Asian Nations
ATS:	Automated Trading System
BIS:	Bank of International Settlement
CAMELS:	Capital Adequacy, Assets, Management Capacity, Earnings, Liquidity and Sensitivity
CAPM:	Capital Asset Pricing Model
CAR:	Capital Adequacy Ratio
CBK:	Central Bank of Kenya
CMA:	Capital Market Authority
DASS:	Delivery and Settlement System
DV	Dependent Variable
EA:	East Africa
EGARCH:	Exponential Generalized Autoregressive Conditional Heteroscedasticity
EMH	Efficient Market Hypothesis
EPS:	Earnings Per Share
EWMA	Exponentially Weighted Moving Average

FE:	Fixed Effects
FTSE:	Financial Times Stock Exchange
GAO:	Government Accountability Office
GARCH:	General Autoregressive Conditional Heteroscedasticity
GCC:	Gulf Cooperation Council
GDP:	Growth Domestic Product
IFC:	International Finance Corporation
I & M:	Investments and Mortgages
IMF:	International Monetary Fund
IPO:	Initial Public Offer
IV	Independent Variable
KNBS:	Kenya National Bureau of Statistics
KSH:	Kenya Shilling
LLRGL:	Loan Loss Reserve to Gross Loans
MA	Moving Average
ML:	Maximum Likelihood
MM:	Modigliani & Miller
MPT:	Modern Portfolio Theory
MV	Moderating Variable
NASI:	Nairobi Securities Exchange All Share Index
NPL:	Non-Performing Loans
NSE	Nairobi Securities Exchange
NPLGL:	Non-Performing Loans to Gross Loans
PP:	Phillips Perron
RE:	Random Effects

ROA:	Return on Assets
ROE:	Return on Equity
SDA:	Stand By Arrangements
SEC:	Securities Exchange Commission
SPSS:	Software Package for Social Sciences
UK:	United Kingdom
USA:	United States of America
USD:	United States Dollars.
VIF:	Variance Inflation Factor

DEFINITION OF TERMS

Capital risk: refers to the uncertainty that an investor may lose part or all their capital investments. (BIS, 2011).

Commercial bank: is a financial institution with main objective of financial intermediation; lending money to deficits units inform of secured and unsecured loans and provide savings, term deposit, transaction, and money market accounts to surplus units (Greuning & Bratanovic, 2009).

Credit risk: is the prospective or current risk to earnings and capital because of the obligor's failure to meet the terms of any contract with the bank. It is probability that the return on loans or on investments will oscillate from that which is expected (Chen & Pan., 2012).

Financial Performance: is a measure of asset utilization by a firm to generate revenues. It is a measure of general financial health of a firm over a specified period and can be used to rate firms of same industry, across industries or inter-industry comparison. It quantifies as a ratio of return on asset, return on investment or return on capital employed (Business Dictionary, 2015)

Financial risk: refers to the possibility that the outcome of an action or an event may cause adverse impacts on the institutions capital or earnings. These adverse effects could result to direct loss of capital or earnings/capital or constraints on a bank's ability to meet its business objectives (Jorion, 2007).

Liquidity risk: is the risk due to banks inability to honor its obligations when as and when they fall due without suffering unacceptable losses. It is the inability to fund increases in assets and meet obligations as they fall due (Kiyotaki & Moore, 2008).

Market risk: is the risk that the value of on and off-balance sheet positions of a bank will be adversely affected by movements in prices or markets rates such as foreign exchange rates, interest rates, credit spreads, equity prices or /and commodity prices leading to a loss in earnings and capital (Hyde, 2007).

Stock return volatility: refers to the uncertainty of returns of the underlying assets due to changes in flow of information concerning the stock into the stock markets (Panait & Slavescu, 2012).

Stock returns: is the utility accruing to an investor as a result of changes in earnings, dividends and share price at the market (Aghababaei et al., 2013).

ABSTRACT

In Kenya, the phenomenon of stock return volatilities and increasing financial risks has adversely affected investor returns at NSE. To boost investor's capacity to reliably predict volatilities of stock returns in risky financial environment. Credit risk, market risk, liquidity risk and capital risk forms major financial risks affecting banks. This study sought to investigate the influence of financial risk on stock returns of commercial banks listed in NSE. Descriptive survey, correlational research and panel research designs were employed in the study. The study was based on 11 listed banks as at the end of year 2015. Stratified purposive sampling was used to select 364 bank managers for primary data and 9 listed banks between 2006 to 2015 for secondary data. The study was analyzed based on four models: OLS model using SPSS analyzed primary data, GLS non-linear model using R studio software analyzed aggregated annual secondary data, Fixed and Random model using Eviews analyzed panel data while GARCH (1,1) model using Eviews analyzed monthly secondary data. For OLS and GLS models, the study established that credit risk, market risk, liquidity risk and capital risk are singly and jointly significant in predicting stock returns of banks listed in NSE. Fixed and random panel data estimation established that credit risk, market risk, liquidity risk and capital risk influences stock returns in the short run than in the long run. The study found that bank size has a negative and significant moderating effect on the influence of financial risk on stock returns. GARCH model established that financial risk negatively influences stock returns and that stock return volatility is time-varying, stock return generating and predictive of stock returns. The overall conclusion of study is that financial risk negatively influences stock returns of banks listed in NSE. The study recommends that the subject of financial risk and stock returns is critical to investors in the stock market, bank managers in prudent management of financial risk and regulators in designing appropriate monetary tools to safeguarded the economy from adverse effects of financial risks. The study recommends that optimal banks size need to be determined to moderate implications of financial risk on stock returns of listed banks. This research is a spatial extension of the previous researches and was conceptually limited on emerging measures of financial risk such as derivatives. However, this has been directed for further study. Investors, hedgers and speculators should also appreciate the impact of financial risk on their stock returns while making investment decisions.

CHAPTER ONE

INTRODUCTION

This chapter introduces the study. It begins by establishing the background to stock returns. It also establishes literature relating to financial risk as a determinant of bank stock returns sensitivity. This chapter expounds on the behavior of bank stock returns and the context to financial risk in the global and local environment. The background highlights on the accompanying theoretical underpinnings. The chapter expounds on statement of the problem besides clarifying the objectives and hypothesis of study. The chapter ends by justifying, scoping and enumerating limitations of the study.

1.1 Background of the Study

Investors exist at the stock market to maximize their returns. Banks leverage this objective through their core function of financial intermediation. However, the main economic function of banks revolves around taking financial risk. If banks avoid risk to minimize failure rates to zero, they limit the purpose of banking system to promote investor value (Greuning & Bratanovic, 2009).

Stock market is a market that facilitates trade of company and government securities. It helps in maximizing shareholder wealth in the security exchange and promote formation and efficient allocation of capital. This makes a stock market critical for economic growth (Sobia, Arshad & Szabo, 2015). Koller, Geordhart and Wessel (2010) expressed that it is more valuable for investor to focus on market value than just firm value. The stock market is a market place that promotes transparency and proper valuation of the share. It synthesizes all the information regarding a stock and adjust the price based on the information relayed. However, the level of market efficiency determines the accuracy of the stock price.

To maximize wealth, investors need accurate and reliable information on the drivers of stock prices. Maxims of efficient market hypothesis contends that stock prices respond to news released to the markets which could be in the form of financial statements, press briefings or insider information. The massive loss of investor's

wealth in the stock markets has been associated with negative information relating to financial risk creeping into the stock markets (Mehri, 2015).

Stock return refers to the stake an investor generates by investing at the securities exchange. The stake could be a gain or loss attributed by capital gains and/or dividends yield (Predescu & Stancu, 2011). The idea of maximizing stock return therefore involve taking risk at the market place. Standard theory of finance and empirical evidence postulate that expected return of a market portfolio is based upon the variance of its expected returns. This relationship is supported by the theoretical foundations of Modern Portfolio Theory by Markowitz (1952), Capital Asset Pricing Model by Sharpe (1964) and Black and Scholes (1974). Sukcharoesin (2013) supported this theoretical framework that there exists a relationship between risk, returns and volatility of stock returns and that decline in stock prices is associated by increase in volatility.

The analysis of stock returns sensitivity has attracted great interest in the field of financial economics. Engle, Jondeau and Rockinger (2012) argued that stock sensitivity creates stock return volatility and that volatility of stock returns spurs possibilities of wealth creation and at the same time imply possibility of market instability and possible losses. In the case of banking stocks, volatility indicates liquidity and solvency concerns. Mouna and Anis (2015) ascertained that the uncertainty surrounding bank stock returns can be described by volatility of stock returns. Stock return volatility refers to the uncertainty of returns of the underlying assets due to changes in flow of information concerning the stock into the stock markets. Negative information increases the variability over varied periods making it difficult for investors to predict returns. This scenario makes stock returns sensitivity invaluable component to fund managers, speculators, investors, risk managers and regulators. Ogilo (2008) implied that sensitivity in stock returns is characterized by the uncertainties of the stock markets inferred by bull and bear episodes; where the stocks prices increase from trough to peak and also decrease from peak to trough by huge margins. Bull episodes are evidenced to last longer than bear episodes making it riskier for investors to hold stocks longer at the bull phase.

Modeling of stock returns form a good measure of uncertainty surrounding stock returns due to effects of financial risk (Mouna & Anis, 2015). Modeling volatility of bank stock returns helps to establish whether systemic risk in the financial markets are influencing returns due to investors. It helps to establish whether volatility is a time varying property of stock returns. Volatility tendencies are evidenced by small shocks ensuing large shocks. This implies negative information generate greater variations while positive news generates smaller variations (Tripathy & Gril-Alana, 2010). Panait and Slavescu (2012) inquired on volatilities and persistence at Bucharest Stock Exchange in Romania using GARCH-In-Mean Model. Ndwiga and Muriu (2016) investigated the NSE 20 share index stock returns volatility using asymmetric and symmetric GARCH models and established volatility constitute systemic risk of returns within an asset. Falato and Scharfstein (2015) established that although volatility in banks positively influences stock returns, short term pressure from the stock market provokes generation of external and internal financial risks which viciously adversely affects bank stock returns and overall economic instability. Al-Tamimi, Miniaoui and Elkelish (2015), Jorion (2007) and Basel 111 under BIS (2011) established macroeconomic factors being external market based risks affecting banks with credit risk, operational risk, liquidity risk and capital risk being internal financial risk affecting banks. Empirical literatures remain nascent and contradictory on the actual determinants of stock returns sensitivity. Rahman (2010), Bhati and Sultan (2012), Mehri (2015) argued that financial risk theoretically and empirically is proven to influence stock returns. Chou, Ko and Lin (2010) established that investors in emerging markets are mere herd and noise traders as they fail to consider external and internal firm risk fundamentals in their investment decisions.

This study sought to determine the influence of financial risk on stock returns. The study therefore defined financial risk according to BIS (2010) under Basel III accord, Jorion (2007), Al-Tamimi, Miniaoui and Elkelish (2015) which referred to Financial risk as the uncertainty or potential financial loss to earnings and capital. The studies defined financial risk as an umbrella term of risks factors which include credit risk, market risk, liquidity risk and capital risk and. Under these studies financial risk has been broadly classified into diversifiable risk based on company specific risk factors

and un-diversifiable risk due to macroeconomic factors. Financial risk is considered systemic and pro-cyclical likely to cause distress to an entire financial system (Falato & Scharfstein 2015). Devastating effects of financial crisis on investors and the global financial system led to introduction of micro and macro prudential regulation under Dodd-Frank Act to protect public listed banks in the United State of America. The Act classified large listed banks as Systematically Important Financial Institutions (SIFIs) to aid monitoring, limit market based activities and increase transparency (Laeven et al., 2015). During recessions, the adverse trends in market based macroeconomic fundamentals inhibit borrowers to meet their debt obligations prompting a credit risk pro-cyclicality, this causes distress due on capital and consequently loses to earnings. Capital inadequacy effects spills into the market leading to a fall of equity prices again triggering prompting a leverage pro-cyclicality. The saving units gets distressed due to depressed funding on banks. Economic crises therefore arise due to banks interconnection, market fear, chaos and irrational episodes of despair (Acharya et al., 2010).

Credit risk is defined as the risk of default; it refers to obligor's inability to meet his debt obligations (Chen & Pan, 2012). According to Kolapo et al. (2012) the high risk of default by borrowers in banks has been associated to high appetite for lending, excessive credit extension and poor credit management practices. Banks with higher levels of credit risk are prone to systemic risk. The adverse effects of credit risk on bank stock returns can be well related to the effects of global financial crisis (Abu et al., 2015). The BIS (2011) adopted Basel III accords to regulate and reduce impact of credit risk on banks. Research has observed that investors in banks with credible credit risk management skills such as securitization programs do not have their stock prices adversely affected on announcement of high non-performing loans (Greuning & Bratanovic, 2009). Mehri (2015) established credit risk negatively affects returns of non-financial firms.

Market risk is the risk of loss due to fluctuations of market prices arising from changes in prices of commodities, equities, interest rates, exchange rates and related on and off balances sheet positions (BIS, 2011). Banks borrow short term funds to settle day to day trading activities which expose them to interest rates risk. Banks

also hold portfolios in their balances sheets which are prone to revaluations due to fluctuations in exchange rates. However, efficient banks in advanced markets hedge against market volatility on and off balance sheet positions (Syed & Anwar, 2012). Balasubramnian and Cyree (2014) analyzed the effect of Dodd-Frank Act on banks in the USA market and established the need to set up buffer capital provisions to absorb losses arising due to unavoidable systemic shocks due to integration of the financial system. Banks in Kenya are vulnerable to systemic risk and therefore adequate measures and regulations should be put in place to protect stock investors (Muiruri, 2014). Hyde (2007), Sukcharoesin (2013) held market based risk of interest rates and exchange rate affects stock returns.

Liquidity risk is the uncertainty that a bank is unable to fund its daily cash flow obligations and grow assets without experiencing intolerable losses (BIS, 2011). Saleh (2014) established that barely every transaction in banking business bears liquidity risk implication. This makes liquidity the heart of the banking system. Therefore, it is essential for banks to ensure they hold adequate liquidity provision to cushion against the shortfall of liquidity which could trigger a systemic repercussion to the financial system. The implication of liquidity risk in banks affects adversely investor's wealth not only in the banking industry but in the entire financial system (Dick-Nielsen et al., 2013). To safeguards banks against adverse effects of liquidity risk, BIS (2013) adopted a liquidity risk monitoring approach which required banks to adopt a funding strategy to ensure policies set on collateral positions, contingency funding plans, regular stress test and public disclosure are adhered to. In Kenya, the impact of liquidity risk continues to hurt investments and the economy in general (Maaka, 2013). Akram (2014) held that liquidity risk adversely affects stock returns.

Capital risk refers to the uncertainty that the cushion that safeguards depositors and shareholders from loss due to eventual risk is inadequate. It is inadequacy of the required buffer to protect banks against unexpected losses (BIS, 2011). Bank capital serves as a safety net that protect banks due to losses as risk crystalizes (Acharya et al., 2010). Mathuva (2009) held that capital adequacy is not an alternative to imprudent management of risk. Capital inadequacies impair public confidence to save with banks. Inadequate funding provokes liquidity risk. The cyclical trend hurt

the shareholder wealth and the entire financial system. Basel II accord provide that banks should hold minimum tier 1 capital of 8% being the ratio of core capital to risk weighted asset. Minimum tier 2 capital of 12% being ratio of tier I capital plus asset revaluations, hybrid capital instruments and subordinated term debt to risk weighted asset and minimum of 12% tier 3 capital being ratio of tier 1 plus tier 2 plus short term subordinated debt to risk weighted assets. Tier 1 is the regulatory capital while tier 2 & 3 are classified as supplementary capital (Greuning & Bratanovic, 2009). Wakid et al. (2013) found that capital structure and financial performance are significant to sensitivity in stock returns.

Sobia et al. (2015) opined that post global financial crisis, the phenomenon of increased financial risks at the capital and financial markets has solicited discussions in a bid to find solutions on how to alleviate the impact of emerging financial risk on investors. The appreciation of the US dollar against major currencies, mixed banking regulatory environment, collapse of the oil prices and shift of monetary policy by Federal Reserve to decrease interest rates are identified to be the likely triggers of the next financial crisis. Global Stability Report (2015) indicated that credit cycle dependence has lead banks in emerging markets to thinner capital buffers, increased non-performing loans as asset and corporate earnings deteriorate. The report associated sensitivities in stock returns at the stock markets to financial risk.

The Eurozone market has been in turmoil since the strike of global financial crisis despite remarkable efforts by the European Central Banks. Although there have been signs of recovery, Eurozone countries are still grappling with high public debt to GDP ratio, high non-performing loans, high inflation, and general economic imbalances (Baglioni & Monticini, 2013). The implications of United Kingdom exit 'Brexit' from the European capital market especially at the time when issuers and investors in Europe are seeking liquid financial markets. USA federal bank quantitative easing undermined the initial recovery euro economy post global recession. Inadequate market liquidity and undermined capital flows have affected the performance of banks and the health of corporate firms equally in emerging economies (Acharya & Steffen, 2015).

Allen, Babus and Carletti (2010) established existence of systematic risk in the African financial sector is caused by external economic factors than internal risk from a series of major and minor financial crisis. World Economic Financial Survey (2015) reported that post subprime crisis, African economies are still grappling with US dollar appreciation and falling of oil and commodity prices stifling current account deficits and sovereign debts. Geopolitics and terrorism in Kenya, Somalia and Nigeria increased the systemic risks as volatility of stocks in Africans mega economies increased. Global Economic Crime Survey (2016) established that economic crimes of assets misappropriation, cyber-crime, corruption, accounting fraud and money laundering are more prominent in financial service industry than in other industry making investment in banks more vulnerable to loss of value than other sectors.

Kenyan financial market forms an integrated component of the world economy. Systemic shocks of the global economy have direct and indirect effects on the Kenyan economy (Ouma & Muriu, 2014). Kenyan shilling depreciation of the Kenya shilling against the US dollar fell to Ksh 105 per US dollar in 2015 from Ksh 88 per US dollar in 2014. To stem exchange rate volatility, 91-day Treasury bill increased from 8.29% in 2014 to 14.61% in 2015. This triggered an increased in lending rates and consequently increased the level of non-performing loans from 103.7 billion to 124.7 billion in the similar period (CBK, 2015). The country public debt to GDP ratio increased from 44.2% to 52.8% for the year 2014/2015 (KNBS, 2015). Kenya financial system witness bank failures with imperial bank, Dubai banks and Chase bank placed under receivership. This is evidence that financial risk poses a great threat to the stability of Kenya's financial system (CBK, 2016).

Financial markets play a significant function in a country's economy. Besides bridging the gap between savers and investors, it also acts as a barometer of an economy by channeling all shocks in a country to the rise and fall of the stock prices (Aduda, Masila & Onsongo, 2012). Nairobi Securities Exchange (NSE) is the official stock and security market in Kenya where securities are bought and sold. It is regulated by the Capital Market Authority of Kenya and draws its membership to investment bank and stock brokers. It serves the role of valuing securities, facilitating

transaction security, provide market liquidity, and enhance better allocation of capital in the country (NSE, 2016).

Besides an efficient stock and securities market, the soundness of a country's banking system is an essential ingredient to ensure the economic growth and stability of a country. Banks define their core function of financial intermediation through their balance sheet. The asset side facilitates movement of cash by lending to the deficit units, whereas on the liability side provides liquidity to the surplus units (Halling & Hayden, 2006). As at 31st December 2015, the Kenyan banking sector comprised of 43 commercial banks, 12 microfinance banks, 1 mortgage finance company, 8 foreign banks representative's offices, 3 credit reference bureaus and 86 foreign exchange bureaus. Among 43 banks, only 11 banks are listed. In Kenya, banking sector is regulated by the company's act and the Central Bank Act (CBK, 2015).

Listed banks in vast economies constitute small number of large, complex financial institutions which account for most cross-border systemic financial intermediation. They facilitate major economic benefit by promoting cross-border capital flows and allocation of global savings (Vinalis et al., 2013). Although the evidence that most listed banks are large banks is mixed, this phenomenon is true for Kenya (Banking Survey, 2015). Due to their size and scale listed financial institutions benefit from their economies of scale attributed by diversification.

Despite benefits of diversification, large listed banks are largely prone to financial risk compared to small banks which jeopardize economic stability. This compels economies to provide bailouts contingency plans which are not always feasible and timely. This poses threat to investor confidence in the stock markets resulting to low demand and plunging of stock prices triggering volatility of stock returns. Listed banks complex economic structure exerts complexity over the regulatory and supervision over other institutions (Laeven et al., 2014). In Kenya, there were 11 listed banks as at 31st December 2015, identified by CBK as systemically important banks accounting for over two-thirds of total banking sector in asset base and profitability. They include Barclays bank, CFC Stanbic bank, Diamond Trust bank,

Equity bank, Housing Finance, Kenya Commercial bank, National bank, NIC bank, Standard Chartered bank, Co-operative bank, and I & M bank (Banking Survey, 2015). This statistic confirms commercial bank listed in NSE an important unit of analysis for this study.

According to Basel Committee on Banking Supervision, large institutions are susceptible to contagion effects of financial risk and therefore are complex to regulate, supervise, and restore in an in the event of failure (BIS, 2010). This reflects complexity and integrated nature of their group structures and operations, with multiple legal entities spanning national borders and business lines. This complexity often contributes to inadequate risk management, and is highly prone to systemic risk (Aga et al., 2013).

When the crisis hit, banks require public sector support and where this is not feasible the financial sector stumbles which adversely affect investments in the stock market. Bank runs erodes confidence in the banking system making banks stocks volatile. Rapid expansion in credit post financial crisis continue to pose a great risk to survival of big banks even as the capital market increases disclosures and transparency on bank dealings. Banks are required to boost capital buffers to provide sufficient shock to absorb the rise in non-performing loans and other associated risk precipitating the decline in bank stock returns (Mouna & Anis, 2015). Destruction caused by spiraling financial risk post global financial crisis is proof that the plight of investors especially in the financial sector is far from over as evidenced by global statistics on the scourge facing banking stocks. Year 2015/2016 global banks stocks dropped drastically. Deutsche bank lost 56%, Credit Suisse lost 62% and Euro STOXX Index tracking 48 Europe largest banks lost 48% (Bloomberg, 2016). Similarly, year 2015/2016 Kenyan banks shares also dropped drastically; Barclays bank lost 49%, CFC stanbic lost 44%, Equity bank lost 42%, KCB lost 52%, NIC bank lost 61%, Stanchart bank lost 45% and Co-operative bank lost 32% (NSE, 2016).

Fundamental and foundational analysis of this study poised on the influence on financial risk on stock returns is anchored on strong financial theory that put emphasis on risk as a key predictor of stock returns. Modern Portfolio Theory (MPT) by Markowitz (1952) derives the foundational principle of risk and returns from Mean Variance theory. MPT was later expanded by Sharpe (1964) and Lintner (1965) with Capital Asset Pricing Model theory. MPT contends that, in making investment decisions investors engage in risk to grow wealth to a given level upon which they adjust their returns expectations. To maintain increase in wealth without corresponding increasing risk; Markowitz suggested portfolio diversification into a basket of negatively correlated assets. Mangram (2013) conceptualized the principle portfolio diversification to an analogy in social reality. He compared the benefit portfolio optimization to maximize expected returns while at the same time minimizing associated risks to the analogy of putting all eggs in one basket. The reality is that there is a great risk of losing all them just in case risk strikes. Ross (1976) advanced expected return risk theorem with his Arbitrage Pricing Theory (APT) and argued that, besides asset based risk, several other factors drive expected return. He concluded that expected return is a linear function of a series of beta risk factors to determine expected return on investments. Empirical studies have established financial risk affects stock returns at the stock market (Sobia et al.,2015, 2011; Rahman, 2010). Mehri (2015) and Naser et al. (2011) held a similar view by establishing that expected stock returns are a function of external risk being macroeconomic factors of risk and internal risk being firm based risk.

Modigliani and Miller (MM) theory of capital structure holds that adequate capital promotes value of the firm (Modigliani & Miller, 1958). In their first proposition, MM demonstrated that debt and equity under perfect market conditions capital are irrelevance in promoting value of the firm. This theory was criticized since perfect market does not exist in real life. In 1963, MM argued that capital structure is relevant in influencing firm value. They introduced tax advantage since interest on debt is tax deductible. The value of levered firm was found to be higher than the value of unlevered firm. Kraus and Litzenberger (1973) enhanced MM theory by advancing Trade off theory which advocated for an optimal balance between debt and equity to avoid distress cost of bankruptcy due to debt capital. Wakid et al.

(2013), Kashyap et al. (2009) and Acharya et al. (2010) supported the proposition that banks hold capital to absorb shocks as a result of systemic risk facing banks to safeguard stock returns.

Fama (1970) conceptualized Efficient Market Hypothesis (EMH) Theory and categorized the market in three forms; weak, semi strong and strong. The theory hypothesizes that under weak market, prices do not reflect historical, public and private information. This notion under EMH supports fundamental analysis where external risk and firms internal risk are evaluated as historical information and how it affects stock returns. Hooy et al. (2004), Naser et al. (2011) and Hyde (2007) supported fundamentalist in their findings.

Financial risk has also been evidence to have an influence on financial performance of banks. Investors in stock markets use financial performance information to make buy or sell decisions (Eken, Selimler, Kale & Ulusoy, 2012). Since global financial crisis, evidence of deterioration of investor market value due to increase in financial risk in the financial market has continued to manifest thus attracting interest of researchers and regulators (Ongore & Kusa, 2013).

Kenyan large and listed banks are considered too important to fail. This is because they are highly vulnerable to risk posing danger to a country's financial system and consequently uncertainty to returns on investments at the stock market. To reduce and manage this negative externality of financial risk on listed banks in Kenya this study pursued to investigate the influence of financial risk on stock returns for listed banks at NSE. The findings will help investors consider financial risk in their investment in banking stocks, bank managers to manage financial risk and align their risk appetites to maximize shareholder wealth, central bank to determine appropriate regulatory approach to ensure a robust financial system amidst a risky and challenging financial environment.

1.2 Statement of the Problem

The phenomenon of decline in bank stock prices and the increasing financial risks post financial crisis has led to huge losses and uncertainties to investors (Mouna & Anis 2015). Banks are the cornerstone of the financial system that keep the funds flowing through the economy. It follows that if the banks are struggling, it means the economy is likely to have major problems (Machuke, Mwita & Kihoro, 2014). Investors maximize returns against lowest risk possible. In Kenya, the unprecedented losses on bank stocks yield concerns whether investors at NSE care about financial risks when making investment decisions.

Effects of post global financial crisis notwithstanding, world bank has indicated an eminent banking crisis with global banks stocks struggling amidst vicious cycle of slaking economic growth and unwarranted protectionism as evidenced by UK under Brexit, USA versus China trade sanctions. Year 2015/2016 global banks stocks dropped drastically. Deutsche bank lost 56%, Credit Suisse lost 62% and Euro STOXX Index tracking 48 Europe largest banks lost 48% (Bloomberg, 2016). Similarly, year 2015/2016 Kenyan banks shares also dropped drastically; Barclays bank lost 49%, CFC Stanbic lost 44%, Equity bank lost 42%, KCB lost 52%, NIC bank lost 61%, Stanchart bank lost 45% and Co-operative bank lost 32% (NSE, 2016). Pension funds' investments in banking stocks declined from 30% to 27.1%. Dividends in banks reduced with 3 banks placed under receivership (Forbes, 2016). The concern on loss due to investors in banking stocks amidst increasing financial risk indicators in Kenya forms the basis of the problem in this study.

Sobia et al. (2015), Mehri (2015), Purnamasari et al. (2012) established that there exists meaningful influence of financial risk on stock returns but also with a raft of mixed reactions. Sobia, et al. (2015) concluded that interest rates and exchange rates hold negative significant relationship with stock returns. Purnamasari et al. (2012) established that earnings were negative and significantly related to stock returns due to volatility of EPS. Capital risk was significantly related to stock returns while liquidity risk and credit risk proved insignificant to stock returns. Cheng and Nasir (2010) established only liquidity risk provided a significant response to stock returns

while interest rate, exchange rate, credit risk and solvency risk were not significant although earnings remained a strong predictor of stock returns. This study recognizes importance of this findings but purports to enrich the literature with an alternative methodology of generalized least square method over ordinary least square method to handle inconsistencies of financial data. This study also pursues cross sectional fixed and random model to establish influence of financial risk on stock returns in the long run and short run considering individual bank risk and stock returns. GARCH model has also been used to establish the influence of financial risk on stock returns though a regression based on volatility modeling. The study addressed this methodical and conceptual gap.

Specific Studies based on specific risk on stock returns such as Kang and Kang (2009), Aga et al. (2013), Muiruri (2014) focused on single factor models to explain the influence of risk on stock returns. However, they require multi factor models to incorporate combined effect of systematic and unsystematic risk on stock returns. With due regard of their findings, previous empirical studies did not factor the effect of size as a moderator variable on the influence of financial risk on stock returns. These omissions form the basis of this study.

Local studies Kithinji (2010), Lakorito et al. (2014), Mathuva (2009) and Muriithi (2016) have focused on the relationship of financial risk on financial performance with little or no regard to influence of financial risk on stock returns. This study intends to fill this gap considering that the Kenyan economy is facing renewed financial risk and eminent banking crisis due to internal inadequacies of taming financial risks. NSE has also evolved though demutualization, securitization and derivative trading invoking mixed reaction in understanding of increasing risk versus market efficiency. This study intends to encompass effects of this developments by studying the influence of financial risk on stock returns of commercial banks listed in NSE.

1.3 Research Objectives

1.3.1 General Objective

The objective of the study was to investigate the influence of financial risk on stock returns of commercial banks listed at the Nairobi securities Exchange.

1.3.2 Specific Objectives

The study pursued the following specific objectives:

1. To examine the influence of credit risk on stock returns of commercial banks listed in NSE.
2. To establish the influence of market risk on stock returns of commercial banks listed in NSE.
3. To analyze the influence of liquidity risk on stock returns of commercial banks listed in NSE.
4. To assess the influence of capital risk on stock returns of commercial banks listed in NSE.
5. To investigate the moderating effect of bank size on the influence of financial risk on stock returns of commercial banks listed at the NSE.

1.4 Research Hypotheses

The study sought to test the following hypothesis:

H₀₁: Credit risk does not significantly influence the stock returns of commercial banks listed in NSE.

H₀₂: Market risk does not significantly influence the stock returns of commercial banks listed in NSE.

H₀₃: Liquidity risk does not significantly influence the stock returns of commercial banks listed in NSE.

H₀₄: Capital risk does not significantly influence the stock returns of commercial banks listed in NSE.

H₀₅: Bank Size does not significantly have a moderating effect on the influence of financial risk on stock returns of commercial banks listed in NSE.

1.5 Significance of Study

To researchers and academicians, the study will add value to existing body of knowledge in financial risk, stock return volatility and market value of shareholders in the following ways. The study help in identification of key financial risk such as credit risk, market risk, liquidity risk, capital risk, stock volatility and how they influence sensitivity of stock returns. The analysis on influence of financial risk on stock returns using GARCH model will be an additional value on the existing body of literature. The study also adds value to researchers by determining the moderating effect of bank size on the influence of financial risk on stock returns.

To bank managers, the study will clarify the relationship that exists between financial risk and stock returns for listed banks at NSE. The impact of financial risk on global financial institutions indicated that financial risk if uncontrolled is devastating and contagious to banks and the economy. Managers will draw value on how effective financial risk management and governance on principal agency relationship can promote financial stability and investor value.

To fund managers, hedgers, speculators and other investors, the study will help to understand the relationship between financial risk and stock returns. The main objective for investors is to maximize shareholder wealth. This happens through risk-return trade off and therefore the need to establish the optimal risk for a given return is paramount. Investors will also benefit from the knowledge of setting aside risk capital whenever they engage in speculative and systemic investment ventures. This will help in risk mitigation and promote alternative risk insurance options. Volatility modeling will help investors to forecast stock returns in a volatile market environment to make optimal investment decisions that facilitate investor's capacity to exploit opportunities created by market inefficiency.

To financial market regulators such as CBK and the CMA will appreciate the relationship that exist between risk and return on banking stock at NSE. The relationship between bank risk and systemic risk on the stock returns will help the regulator in setting banks risk limits especially on the liquidity ratio, capital adequacy ratio, portfolio at risk, core capital to risk weighted average ratio. The study will anchor determination of risk capital provisions for different classes of risks for the banking industry in Kenya. Effects of conditional volatility on stock risk premium will help the CMA to promote the level of market efficiency, market discipline, and transparency. This will enhance fair play at the market place and minimize the adverse effects on the economy due to huge volatilities that arise due to wasteful speculations.

1.6 Scope of the Study

In line with the objectives enumerated in section 1.3, the focus of this study was to investigate how financial risk influence stock returns of commercial banks in Kenya. The study was limited to listed banks at the Nairobi Securities Exchange as referenced in appendix 3. According to banking survey report (2015) listed banks share of the total banking industry accounts for an average of 79.1% in profitability, 71.6% in asset base, 75.1% in total net advances, 72.1% in total deposits and 73.4% on total bank accounts. These performance indicators demonstrate that listed bank drives the banking sector in Kenya and therefore a study on focusing on listed banks forms a significant sample to generalize the findings for the Kenyan banking industry.

The study period entailed ten year from 2006 to 2015 to accommodate for effects of pre-and post-global financial crisis. Ten-year period accounts for longest period the study could access financial data in the Kenya financial system. Questionnaire to access the state of the financial risk on stock returns was administered in first half of 2016. The study was limited to the highlighted objectives on the influence financial risk and stock returns. Financial risk is pro-cyclical and contagious making it a unique area of study since the investor wealth, the financial health of financial institutions and global financial economy is attributable to financial risk.

1.7 Limitations of the Study

This study was based on OLS, GLS, fixed and random and GARCH model methodologies. However, there exist other statistical methods of analysis that can be exploited. Despite the methodical limitation, the findings in this study remain credible for generalisation since it covers time series and cross sectional modes of analysis.

The study focused on listed banks as the primary source of financial risk because they are easily observable, highly regulated. Listed banks in Kenya are large and therefore affect the real economy in Kenya touching through all sectors of the economy. However, there are other sectors that influence financial risk directly such as insurance and energy sectors not included in this study.

The study measured determinants of financial risk based on Jorion (2007) and Basel Basel accords. Despite the fact that the measures used in the study are regulatory and backed by adequate literature; derivative measurement of financial risk, would be of interest to research subject to availability data. This may include derivatives measures of credit spreads and credit default swaps.

The study explored the moderating effect of bank size on the influence of financial risk on stock returns. Bank size measured by log of bank assets is sufficient since it is adequate to literature, straight forward and subject to data availability. However, other measures of moderating effect exist such as market capitalization, revenues, or equity capital. The extension covered under this study is valuable and efficient to existing literature in filling contextual, conceptual, and methodical limitations in relation to influence of financial risk on stock returns. Notably, the study directs observed limitations for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed conceptual and empirical literature on credit risk, market risk, liquidity risk, capital risk and bank size on stock returns of commercial banks listed in Nairobi Securities Exchange. It discussed theoretical foundation of financial risk, developed conceptual framework, undertook a critical review of the literature on the influence of financial risk on stock returns and highlighted research gap.

2.2 Theoretical Framework

Theoretical definitions and conceptualization are as diverse as the number of scholars conducting the research. According to Gay and Weaver (2011) a theory is a collection of structured relationships or laws that entail a logical description of a discipline. A theory is a set of definitions, concepts and prepositions that predict a phenomenon. Theoretical literature is a lens that enables the researcher to view a phenomenon in a wider scope (Blumberg, cooper & Schindler, 2011). Theoretical literature review refers to a detailed and systematic analysis of theory to establish what concepts, construct and phenomena exist, the relationship between them, to ascertain to what extent the theory has been tested and therefore come up with new hypothesis (Kennedy, 2007).

This chapter covers theories that explain the relationship between financial risk and stock returns. These theories include: Modern Portfolio Theory (MPT), Arbitrage Pricing Theory (APT), Modigliani and Miller Theory, Trade off Theory and Efficient Market Hypothesis (EMH). Theory discussions are as below.

2.2.1 Modern Portfolio Theory

Modern Portfolio Theory (MPT) is a finance theory developed in 1950 by Nobel Prize winner Harry Markowitz. It describes an optimal investment decision as one that maximizes the expected return of a portfolio for a given level of risk, or that investment decision that minimizes portfolio risk for a given amount of portfolio

expected return. MPT describes investment using diversification principle where a collection of individual risky assets forms a portfolio bearing an overall discounted risk on the same expected return (Markowitz, 1952).

Markowitz (1952) indicated that returns of assets of stocks and bonds move in opposite directions, but a combination of a stock and a bond yields a portfolio with overall lower risk for a given return. MPT assumes an efficient market with rational risk averse investors; implying that one will only undertake a risky investment only if the returns were commensurate based on individual risk preference. MPT theory defined risk as the volatility of assets prices and the expected return as a collection of weighted asset returns. Harry Markowitz theory (1952) developed a mean variance formulation that combines assets portfolios to generate an efficient frontier curve which identifies the optimal portfolio for investment.

According to Markowitz (1952) and Sharpe (1964) investment portfolio bears systematic risk and unsystematic risk. Systematic risk being undiversifiable risk associated with the market while unsystematic risk being the diversifiable risk associated with individual asset. Investor are not compensated for unsystematic risk since the risks can be diversified by selecting uncorelated assets. This unrealistic assumptions of MPT has been criticised by behavioural economists. Behaviourist argue that financial returns are lognormal and correlations between assets are dynamic (Hodnett & Hsieh, 2012).

The relationship between risk and expected return of a portfolio built on uncorelated assets is shown in figure 2.2. The hyperbola is the efficient frontier with the optimal portfolio where risk free tangents the efficient frontier at the tangent portfolio. Tangent portfolio is the optimal portfolio where the investment bears the highest return at minimal risk.

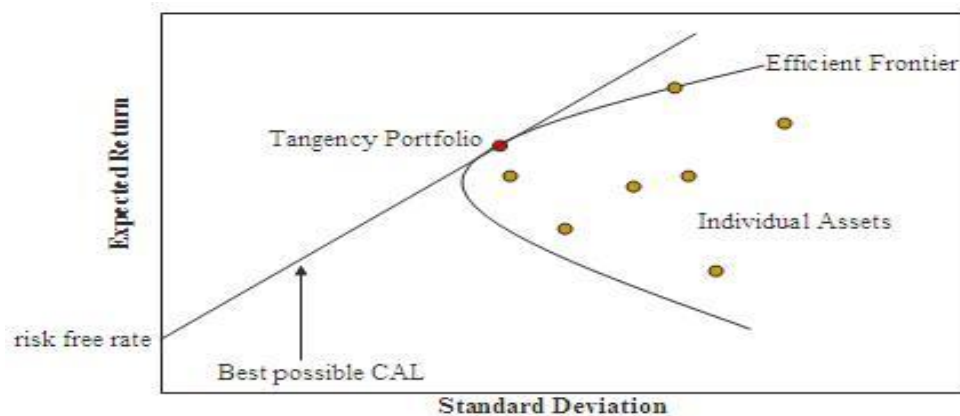


Figure 2.1: Modern Portfolio Theory, Source: Markowitz (1952)

MPT theory by defining the relationship between portfolio risk and expected returns serves as a great link to the study of influence of financial risk on bank stock returns. Similarly, portfolio diversification principle aligns this study and MPT theory. Investors and bank managers will seek to diversify investment in varied uncorrelated sectors to maximize stock returns with overall the benefit discounted portfolio risk. This aligns with analogy of “Don’t put your eggs in one basket”. MPT is relevant to significance of the study of how financial risk influences bank stock returns.

2.2.2 Arbitrage Pricing Theory

Arbitrage pricing theory (APT) is an asset pricing valuation model that describes stock returns as a function of a series of risk factors. The theory was proposed by Roll and Ross (1976). The theory is an advancement of Capital Asset Pricing Model (CAPM) by Sharpe (1964) and Lintner (1965) that contended that asset return is a function of time value of money and systematic risk of an asset. Unlike CAPM that define asset returns as a function of asset risk in relation to market portfolio, APT described that asset returns as a linear function of a series of risk factors ranging from firm and macro risk factors. Compared to CAPM, APT theory is less restrictive in its assumptions. APT theory assumes the markets are perfectly competitive, Investors prefer more wealth to less in search of arbitrage opportunities with asset returns following a stochastic process. The theory aims to clarify that despite the state of market efficiency, asset securities be mispriced from time to time even if it means temporarily. Investors or arbitrageurs by using APT model, considers a series

of systemic and macroeconomic risks likely to affect an asset and establish the expected return of a portfolio; where a variance exists between the market return and the expected returns, the arbitrageurs undertake to optimize the benefit appropriately. Expected return defined by APT model can also be used by the investors as measure of cost of capital. Roll and Ross (1976) summarized APT as a multifactor model establishing relationship between risk versus return. APT factor model can be expressed as below:

$$E(R_{it}) = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2} + \dots + \lambda_n b_{in}$$

$E(R_{it})$ = the expected return on asset I during a specified period of time, $i=1, 2, 3 \dots n$

λ_0 = the expected return on the asset with zero risk

λ_n = the risk premium related to the nth common risk factor; i.e. how responsive is returns of asset i to the nth risk common factor loadings.

The theory is relevant and applicable to the study as a multifactor model that establish the relationship between risk and asset return. This is evident as the study seek to establish influence of a series of financial risk on bank stock returns. The theory is applicable as an excellent mode to guide asset allocation as investors establish mispriced assets; Similarly, in this study investors in banking stocks establish the safe avenues of diversification to engage in to minimize risk while maximizing stock returns.

2.2.3 Modigliani and Miller Theorem

Modigliani and Miller theory also known as modern theory of capital structure was first applied in 1958 by Professor Franco Modigliani and Professor Merton Miller (MM) during their study of economic analysis in corporate finance. Through published articles on American Economic Review, the scholars argued their findings on capital financial decision in two propositions (Modigliani & Miller, 1958). In the first proposition, MM demonstrated the irrelevance of capital structure. They contended that under perfect market conditions, firms cannot benefit from changes in capital financial decisions. The proposition assumed a market with only debt and

equity as the only source of capital, perpetuity profits which cannot be re-invested, Symmetric information and costless market without transactional cost, taxes and agency cost. Since these assumptions are a preserve of a non-existing market and are naturally violated in the real world, MM turned to be a pivot on the modern way of thinking in proving that capital structure is indeed relevant in influencing market value of the firm.

Since Modigliani and Miller (1958) theory is anchored on violation of the real world, MM undertook to develop the theory further in what was latter referred to as proposition two of the relevance capital structure. In 1963, Modigliani and Miller introduced tax advantage to the theorem. They argued that since interest on debt is tax deductible, the value of levered firm will be higher than the value of unlevered firm. They concluded that a firm should maximize debt to gain maximum advantage on tax shield to maximize market value. This proposition was a fallacy in real world as it implied that a firm can achieve an optimal capital structure of 100% which does not exist under normal market condition. The criticism of unrealistic 100% debt prompted the review of proposition two noting that although debt financing is beneficial through tax shield, it does not imply that a firm must maintain maximum leverage in their capital structures. Maximum debt increases the probability of liquidity risk and bankruptcy which is risky to bond holders (Modigliani & Miller, 1963). Due to omissions of MM theory, tradeoff theory of capital structure was unveiled to address these shortcomings (Kraus & Litzenberger, 1973).

Static trade off theory established that firms need to obtain an optimal level of debt and equity to maximize tax advantage and minimize the cost of bankruptcy. They found that to maximize firm market value each firm need have a unique optimal debt to equity ratio (Kraus & Litzenberger, 1973). Myers and Majluf (1984), pursued to strengthen the weaknesses of static theory by popularizing pecking order theory. Peking order theory established that capital adequacy was relevant to firm value and that capital comes from three sources which changes with asymmetric information prioritized internal financing, followed by debt financing and new equity financing as the last resort.

The disposition of capital structure theories grounded by the foundation laid by MM theory shows relevance of capital in maximizing firm value. Demirguc et al., (2010) established to maximize stock returns, banks need to hold sufficient capital to cushion themselves against adverse effects of financial risk. It follows that capital relevant theories are relevant in this study. To safeguard investors interest in the stock market against adverse effects of financial risk, capitalize banks are found to be more resilient with buffers to absorb losses and shocks that come with excessive risk. It is also evident that banks cannot avoid risk thus theories of capital relevance provide a critical linkage in this study.

2.2.4 Efficient Market Hypothesis

The theory of efficient market hypothesis was first conceptualized in 1900 by a French mathematician Lous Bachelier on his dissertation entitled “Théorie de la Spéculation”. The study sought to establish the movements of stock prices as to whether the expectations of the speculators can be based of the past movements. He established that the zero expectations condition on the past movements (Courtault et al., 2000).

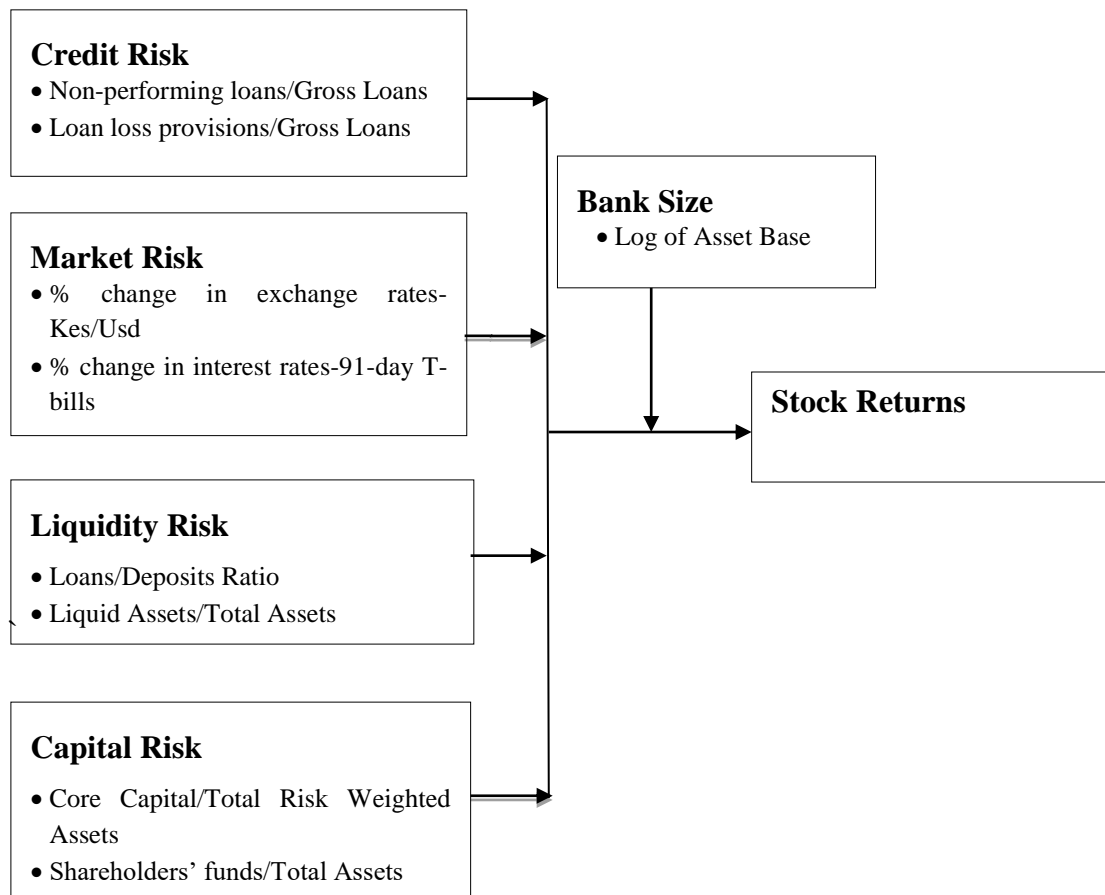
The work of Lous Bachelier was later refined in 1970 by Eugene Fama, a university professor of the Graduate school of business at Chicago university. In his conclusion, Fama established that in general, an efficient market contends that asset prices will always reflect available information. That although an investor can make riskless profits by buying undervalued stocks at lower prices and sell at higher prices, he cannot beat the overall market position which will always be perfects where all participants have equal information. The theory was anchored on the assumption that investors are rational, information gest into the market independently and randomly and prices perfectly adjust to all new and available information. The state of efficiency was defined under three different form. The weak form, the semi-strong and the strong form of market efficiency. He later published this evidence of theory and hypothesis that generally all the to what up to now is a highly-regarded theory of finance.

In its weakest form, the EMH implies that the stock prices have incorporated all the past information and therefore no excess profits can be earned based on past information. This implies that technical analysis, which studies formations in past returns, is useless in predicting the future. Since past performance is already known to the market, the current situation remains unknown. This is where fundamental analysis relevance of this theory gains attention to this study that an investment strategy that analyses information based of risk especially from financial statements will reward an investor in maximizing the returns. Naser et al. (2011) support a weak form of market efficiency where information on financial risk is used to maximize stock returns.

Accordingly, in a weak efficient market, stock returns may be predicted by good or bad information that creep the market based of financial risk. This information may relate to credit risk, market based risk factors such as trends of interest rates and exchange rates, liquidity risk and capital adequacy. This information related association of financial risk and stock returns forms the relevance of EMH theory in this study.

2.3 Conceptual Framework

A conceptual framework is a logical diagrammatic layout of the link that exists between research variables (Cooper & Schindler, 2014). The dependent variable in the study was stock returns while independent variable was financial risk defined by credit risk, market risk, liquidity risk and capital risk. The study entailed a moderating variable of bank size. Figure 2.2 represent the study's conceptual framework.



Independent Variables

Moderating Variable

Dependent Variable

Figure 2.2: Conceptual Framework

2.3.1 Credit Risk

Undertaking bank risk is significant in an economy; credit risk remains a significant risk for the survival and growth of banks (Kargi, 2011). The function of financial intermediation exposes banks to various kinds of risk among them credit risk, market risk, liquidity risk and capital risk. Credit risk stands out as a critical risk affecting 80% of commercial banks' balance sheet considering the level of loans to deposits (Greuning & Bratanovic, 2009).

Credit risk refers to uncertainty that the obligor will fail to honor his debt obligations in accordance with the terms of credit (BIS, 2010). Chen and Pan (2012) defined credit risk as the risk that accrue due to variability of derivatives and debt instruments due to variations in the quality of advances and the underlying counterparties. The risk of default in banks has been associated with high appetite for lending, excessive credit extension and poor credit management practices. Banks with higher levels of credit risk are prone to systematic risk. Due to adverse effects of credit risk during the financial crisis, the Bank of International Settlement (2011) adopted Basel III accords to regulate and reduce impact of credit risk on shareholder wealth and the economy in general. However, Greuning and Bratanovic (2009) found that banks with credible credit risk management mechanism such as securitization programs do not have their stock prices adversely affected with growth in loan assets. Macro-economic factors such as inflation, interest rates, exchange rates and growth domestic product affect loan pricing and ability to pay of the obligors. Internal factors such as efficient credit management practices and balanced appetite for credit risk determine the asset quality held by banks (Mwaurah, 2013).

Empirical literature established a twofold measure of obligor's inability to honor debt obligations. Market based measure of credit risk determined by variability of derivative instruments such as credit swaps and the bank balance sheet measure determined by the ratio of non-performing loans to gross loans and the ratio of loan loss provision to gross loans. This study adopted a balance sheet internal based approach of ratio of non-performing loans and the ratio of loan loss provision. This measure is appropriate in the Kenyan market due to availability of data. The measure is reliably surrogate as market based risk measurements in testing the influence of credit risk to stock returns (Der-Fen, 2005; Abu, Sajeda & Mustafa, 2015).

Non-performing loans (NPLs) are obligations that fall short of contractual provisions in a way that is detrimental to capital and earnings of a financial institution. Central Bank of Kenya classifies outstanding debt obligations according to the number of days in which the debt has fallen due. Normal classification are loans due for payment within 30 days; Watch classification are loans due for payment past 30 days but less than 90 days; Sub-standard classification are loans falling due past 90 days

but less than 180 days; Doubtful NPLs are loans due for settlement past 180 days but less than 360 days; Loss classification are NPLs due for settlement past one year (CBK, 2013).

Research findings have established that deficient credit risk management techniques, insider lending and manager insatiable appetite for lending are the main contributors of high NPLs in banks as evidenced during the global financial meltdown (Mileris, 2012). According to Boahene, et al. (2012) poor credit policies and procedures is a pre-cursor to poor bank asset quality and increased ligations between the bank-customer relationship. This evidence single out credit risk as a significant cause of liquidity risk that triggers banks failures. However, due high appetite for profits by banks, bank managers need to establish an optimal level for interest income due on loans to tame the effects of systemic and cyclical effects of credit risk (Koch & MacDonald, 2006). Profitable banks employ elaborate credit management strategies to optimize the benefits of lending which minimize the adverse effects of credit risk on shareholder value. Efficient banks lay clear credit structures, allocate responsibilities, outline disciplined credit process, enhance communication, and promote accountability.

Loan loss provisioning is the recognition and provision in bank books an estimated proportion of reserves for loss of loan portfolio before the actual default materialize. It is a direct charge from bank earnings used to protect bank capital on the event of actual loss (Beatty & Liao, 2009). Central bank of Kenya regulations requires banks to provide for general provisions at 1% of total loan portfolio while specific provisions are determined based on outstanding loans classified as non-performing. The regulations further require specific provisions on non-performing loans classified under watch classification to charged 3% of outstanding non-performing loans as loss provisions, sub-standard classification to charged 20% of outstanding non-performing loans, doubtful and loss classification to provide for 100% of total loans and interest overdue. The increasing level of loan loss reserves may indicate a doubtful quality of bank assets. Similarly, increasing level could also denote eminent economic downtime or more appetite by the management to venture into risky

lending. Investors interested in bank stocks monitor the trends on bank provision to make buy, sell or hold investment decisions (Danvee, 2010).

Vulnerability of banks due to credit risk goes beyond credit risk management. Capital regulations under Basel (II) accord provide that banks uphold adequate ratio of capital to protect the stock holders during insolvency. Best practice requires most banks to moderate dividends in a bid to build sufficient buffer as a supplementary capital alongside loan provisions. Banks with low capital are associated with high loan provision unlike banks which are adequately capitalized (BIS, 2011).

According to CBK bank supervision report (2015) the trend on aggregate credit risk index has been on the increase implying that commercial banks could face an eminent reduction on revenue streams due to overreliance on interest income from loans. According to the CBK (2016) report, Kenyan banking industry experienced an increase in general and special provision due to high NPLs. This trend is likely to affect dividends to shareholders due to reduced earnings and consequently reduction in stock prices. Consequences of credit risk on the banking sector has provoked regulators to ensure credit managers undertake annual credit risk evaluation on credit operational functions, portfolio management, appropriate asset allocation and compliance to loans provisioning policy (Aghababaei et al., 2013).

2.3.2 Market Risk

Market risk is the uncertainty that the value of on and off-balance sheet positions of a bank will be adversely affected by movements in prices or markets rates such as foreign exchange rates, interest rates, credit spreads, equity prices or /and commodity prices leading to a loss in earnings and capital (CBK, 2013).

Beta factor also known as systematic risk has long been taken to be an adequate measure of risk in the stock market. However, researchers have had long debated on whether beta measure as defined by CAPM is a significant determinant of variability of stock returns at the market place. Most researchers claim that beta is an irrelevant and impractical measure of market risk.

According to Ross (1976) there are various types of market risk factors associated with the asset such a change in interest rates, inflation and productivity that affects expected returns of an asset. Basu (1977) rejected relevance of beta in measuring market risk. In his study to establish relationship between portfolio performance of US stocks and their P/E ratios for the period 1957 and 1971 he established an inverse relationship of low beta depicting low variability of stock returns thus attracting higher returns which was an unrealistic finding. However, the study established that omitted risk variables which he hypothesized to include P/E ratios significantly influence stock returns. Shukla and Trzcinka (1991) investigated US stock market for a twenty-year period. The study tested significance of systematic risk using Beta variable from CAPM and several other variables from APT. The conclusions were established that APT variables explains majority of systemic risk on stock returns compared to the beta factor. Fama and French (1996) conducted across country study involving 13 countries for the period 1974 to 1994. The study aimed to establish why the value of stock beta growth stocks. The findings established that stocks with low price to book ratio, price to earnings ratio experience higher returns than growth stocks. This could not have been established by use of CAPM beta factor.

Fama and French (1998) contended that beta factor does not indicate that variability of beta is good news when overall stock market is facing and uptake in value. The study indicate that beta is only preferred because it is determinable with ease compared to multifactor model. Based on the above evidence and arguments from previous researchers this study focus on the intuition and application of multifactor model to measure and determine market risk. Multi factor models allows for a more expansive definition of systematic risk compared to single factor CAPM. The study used macro-economic indicators of systematic risk of the rate of change of interest rates (91-day treasury bill rate) and rate of change of exchange rate between Kenya Shilling and the US dollar to measure market risk. This measure of market risk conforms to empirical studies according to Sukcharoensin, (2013) and Stuart (2007).

The sensitivity of stock returns due to macro-economic factors has attracted a significant interest from researchers, banks, regulators, and investors. Multi factor models (APT) provide the generic risk factors that describe the influence of stock

returns due to market risk (Sukcharoensin, 2013). Mouna and Anis (2015) explained that incorporating interest rates and exchange rate factors to the CAPM single factor model substantially increases the explanatory power to stock returns variability. Linkage between market risk and stock returns relating to financial institution has become a nascent issue in risk and portfolio management.

Interest rates and exchange rates form the main market risk variables affecting stock returns in financial institutions (Hyde, 2007). As interest rate increases, investors change investment focus from equity market to bond markets and related fixed income investments. This variability triggers a momentum that leads to flow of capital from capital market to money market. This flow explains the negative relation of interest rates to stock returns. High treasury bill rates determine high lending rates. This increases the cost of loans in financial institutions leading to high NPLs. The cost of funding rises as depositors seek higher interest for their deposits. The implication of devaluation of exchange rate on stock returns of financial institutions is highly determined on whether an economy is import based or export based. For an import based economy, high exchange rate adversely affects stock returns. It increases inflation thus reducing demand for stocks as well as reducing banks earning prospects. For export based economies the relationship of exchange rate to stock returns is positive as goods becomes cheaper abroad attracting more sales thus increasing foreign exchange reserves (Alam & Uddin, 2009).

According to CBK Prudential guidelines (2013) banks are required to estimate their level of exposure with regards to market risk and provide for capital charge commensurate to associated risks. Banks are mandated to disclose their market risk exposure on monthly basis, undertake stress testing and uphold impeccable systemic risk hedging strategies to scale up bank resilience against unexpected shocks.

2.3.3 Liquidity Risk

Liquidity risk has been instrumental in causing most historical financial crisis. Post global financial crisis, the banking sector is still experiencing a series of shocks; both systemic and unsystematic. Considering the overall implications in the banking industry, liquidity risk continues to attract attention from researchers (Zhang & Daly,

2013). Allen and Gale (2000) defined liquidity risk as the inadequacy of the liability side of a bank. Inadequate liquidity in a financial system triggers fragility and bank runs in a financial system. Kiyotaki and Moore (2008) described liquidity risk as the uncertainty that arise when a security cannot be liquidated in a market to avert a financial loss. It is the chances of a bank to experience financial losses due to lack of liquidity. IMF (2011) established that liquidity risk played a key role in historical banking crisis, and that the collapse of banks during the global financial crisis was a result of poor liquidity management by financial institutions and inadequate regulatory policies on bank liquidity.

In Kenya, liquidity risk has continued to haunt the regulators and investors. Since the banking crisis in 1994/1993, emerging economies continue to experience liquidity insufficiency. In 2015, Kenya witnessed 3 banks placed under receivership due to funding liquidity which indicating a possible gap by banks to comply with liquidity regulatory provisions, (2015). This scenario is raising concerns to regulators, researchers, financial institutions, and investors on whether Kenya financial system is solid enough to avert banking crisis in future. To avert bank runs, Central bank of Kenya through its arm of bank supervision requires banks to develop resilient strategies and policies to avert liquidity crisis. Banks are required to institute a clear organization structure that will define responsibilities and competencies on liquidity risk management; to enhance internal controls on liquidity risk management on their overall internal risk management; to provide information on liquidity measurement and monitoring; to conduct timely stress testing and provide for appropriate liquidity contingency plans (CBK, 2013).

Inadequate liquidity in banks has been found to be contagious to the entire financial system. The financial system is integrated through pooled investments and inter-bank loans. The economy and financial system are seamlessly interconnected making liquidity risk a threat to the entire economic system. Allowing a single bank to run into bankruptcy is likely to erode the confidence of depositors on the entire financial system (Naceur & Kandil, 2009). Effects of liquidity risk on the banking system has resulted to extensive research worldwide in a bid to explore effects of liquidity risk on stock returns.

With several empirical studies, regulatory framework and actual occurrence proving the importance of liquidity risk on bank stock returns, much still need to be enumerated on how liquidity risk affects stock returns. Yasser and Anna (2018) established that bank liquidity affects bank stock returns. Their study measured liquidity risk based on balance sheet ratio of liquidity gap which was defined by the amount of liabilities less liquid assets normalized by total liabilities. This measure was established to correlated with banks' ability to immediately service sudden outflows. They established that funding liquidity risk affects bank stock returns.

Akram (2014) investigated the effect of liquidity on stock returns. The study defined liquidity from a market perspective as the ability of stocks to be traded in the stock market with minimum bid-ask spread. The study established that the wider the spread implied existence of liquidity risk in the market thus affecting tradability of the stocks and consequently reduced trading implied less stock returns due to investors. This definition of liquidity based on the flow of funds to the stock market was first articulated by Amihud and Mendelson (1986) who established there exist a relationship between market liquidity and stock returns.

This study recognizes there exist a mixed reaction between on what really affects stock returns between market liquid and bank funded liquidity. This study appreciates the fact that liquidity in the market overflows from financial intermediation framework. It follows that bank funded liquidity is the primary source of liquidity that affects stock returns. Dick-Nielsen et al. (2013) in their empirical study on market liquidity and funding liquidity with regards to Danish bond markets established that bank funded liquidity determines market liquidity and consequently, market liquidity drives market returns. This study therefore defined liquidity risk based on the banks' balance sheet approach. The study determined bank funded liquidity to be determined by the ratio of loans to deposit ratio and the ratio of liquid assets to total assets. The measurement adopted is supported by Diana and Moshe (2012), Chortareas et al. (2011), El Mehdi (2014) and Saleh (2014). This granular balance sheet liquidity measurement approach is correlated with liquidity coverage ratio and net stable funding ratio (Yasser & Anna, 2018). The influence of bank funded liquidity risk on stock returns in Kenya is hereby explored in this study.

2.3.4 Capital Risk

Capital risk refers to the risk that the earnings and capital of financial institution are exposed due to lack of risk capital. Capital adequacy also refers to the extent within which bank capital accommodates risk weighted assets. Capital adequacy is a major concern for the banking sector due uncertainty of bank failures and systemic forces in the financial markets (Greuning & Bratanovic, 2009). Zhao (2016) expressed financial distress as a sporadic state of insolvency where a firm develops difficulties in settling obligations but not yet declared bankrupt. Under distress, firms have chances of survival but are still exposed to capital inadequacy.

With Global financial crisis and the occasioned financial market vulnerabilities, fundamental questions have been raised on the role of bank capital on stock returns. As a result, various studies have been undertaken with mixed arguments on whether banks should hold more capital with most studies establishing that capital adequacy influences bank performance (Kashyap et al., 2009). Kose (2011) established the phenomena on equity returns that an increase in short term debt increases equity returns while increase in long term debt decreases stock returns. Berger and Bouwman (2012) examined the relevance of capital on large and small banks under situations of normal times, financial crisis and financial turbulence in the US economy. It was found that capital is relevant for market share and survival of small banks. However, for big banks capital was established to be more relevant during difficult time than normal times.

The business of banking entail banks to undertake financial transaction which exposes banks to probable loses. Normal loses are expected to be absorbed by earnings while unanticipated loses are expected be absorbed by core capital. Adequacy of risk capital safeguards banks from collapse and by extension influences shareholder value at the market place. Capital adequacy boosts confidence of investors and industry players on the financial system of a country (Asikhia & Sokefun, 2013). The importance of capital in the banking sector is evidenced by a series of financial crisis and how they affected investors in the banking industry. In 1987, the world experienced the stock market crash. In early 1990s the world

experienced the banking crisis and in 1998 there was a Russian debt crisis. Early year 2000, the world experienced the dot com bubble and in 2007 to 2009 the global economy experienced the great global financial crisis (Berger & Brouwman, 2011). Post 2015/2016, the world is still experiencing collapse of the commodity prices, contradictory regulatory positions, and bursting of Chinese stock market bubble (Bloomberg, 2016).

Basel committee on banking supervision is a formidable arm of stabilizing banks through regulatory framework. This has been done through Basel provisions. Basel III established that key components towards survival of banks revolves around systemic leverage, liquidity, and capital. In adequate bank regulations, uncontrolled risk appetites on lending and financial innovations were established as the main causes of capital depletion. Basel committee explains that vulnerable capital spiraled the financial crisis (BIS 2011). To safeguard the world economy, Basel committee in Basel III provisions introduced stricter rules compared to Basel I & II to increase consistency, transparency and quality of capital by increasing capital requirements on financing activities, counterparty risk and repurchase agreements. On liquidity, Basel III introduced a global liquidity standard of long term net stable funding ratio to ensure stable sources of funding and liquidity coverage ratio to ensure banks hold high quality liquid assets (BCBS, 2010).

To avert the crisis associated with fragility of the banking sector, Central Bank of Kenya adopted Basel provisions through prudential guidelines regulations. The regulation provides that all banks must hold minimum absolute capital of Kshs 1 billion while financial institutions must hold a minimum absolute capital of Kshs 200 million. The guidelines also provide that banks maintain the ratio of core capital to total risk weighted assets of not less than 8% being minimum capital ratio. Banks also to uphold ratio of total capital to risk weighted assets including risk weighted off balance sheet items of not less than 12% and with an additional capital conservation buffer of 2.5% above minimum capital ratio requirement. Similarly, through the guidelines banks are expected to safeguard risk capital for credit risk, market risk and operational risk depending on their risk appetite and uphold disclosure and market discipline (CBK, 2013).

The above evidence of revamped regulations on bank capital globally and in the local banking regulatory environment insinuate the importance of capital adequacy in the banking sector cannot be over emphasized. Despite the empirical literature, few studies have focused on the effect of capital risk on banks stock returns. This study explores this objective by measuring the capital risk/inadequacy by the ratio of core capital to risk weighted assets and ratio of equity capital to shareholder funds as established by the Basel committee of banking supervision. This measurement is also support by Jheng (2018), Berger and Bouwman (2012), Demirguc et al. (2010), Jing and Kostas, (2012); Der-Fen, (2005).

2.3.5 Bank Size

Empirical studies have coined that the effects of global financial crisis were worsened by systematically important banks. Even though financial crisis revolved around financial risk, large banks have been evidenced to be prone to systematic risk due to their complexity, global interconnection and dealership in market based activities. The adverse impact of large sized banks is established to be more devastating during periods of financial crisis (Vinalis et al., 2013).

In promoting stability of financial institutions, debate has revolved on how to optimize the importance of large banks and minimize the risk associated with size. Given different economies levels and regulation, it has been proved difficult to determine the optimal size of a bank. Basel III and the Volker rule in the United State has emphasized on the need to impose capital surcharge on large banks and restrict market based activities. Some proponents have proposed governments to reduce bail out subsidies and introduce bail-in or contingent capital (Claessens et al., 2011)

Studies have distinguished firm size as a significant factor that determines the degree and direction in which financial risk influence investor value. El Mehdi (2014) alluded that large companies are less culpable to risk compared to small companies and therefore they are likely to perform better. Sobia et al. (2015) while investigating the impact of financial risk on stock returns asserted that as the size of the firm increases, firm risk increases suggesting that large firm could have a volatile share prices behavior compared to small firms.

Berger and Brouwman (2011) determined that bank size, market share and capital size can be used as a control variable measured as a logarithmic notation when evaluating banks. They described that bank size is positively related to probability of survival of banks. They alluded large banks are less affected by financial crisis compared to smaller banks. During normal times, large banks depict high returns compared to small banks than during difficult times. This explains that the effect of risk and returns in banks is determined by the state of the economy. This observation was supported by Shariat and Khosvari (2008) who observed that firm size is negatively related to stock returns during periods of financial difficulties.

Empirical studies have singled out size as an important measure of firm volume. However, Bhattarai (2014) noted that this can be expressed in many ways not limited to turnover, market capitalization, total assets, revenue, capital, and customer base. Without under estimating the importance of various measurement of size, Bhattarai (2014) voted bank size measured by log of total assets as a reliable firm specific measure for banks that influence the internal and external environment of a financial institution. This is evidenced by the study of Almunani (2014) which established bank size measured by log of assets is negatively related to stock prices. This result was a contradiction of general expectation given that large banks are expected to offer better services to customers than small banks and hence attract more revenue.

Banking survey (2016) classified commercial banks in Kenya into four tiers according to size of their assets as at end of 2015. Tier 1 comprised of banks with an asset base of more than 150 billion. The survey established nine banks in this category. Tier II consisted of banks with asset base of more than Ksh 50 billion but less than Ksh 150 billion and this category comprised of ten banks. Tier III consisted of banks with an asset base more than Ksh 15 billion but less than Ksh 50 billion and this category consisted of ten banks. Tier IV consisted of banks with asset base less than Ksh 15 billion comprising of fourteen banks.

As this study evaluates the influence of financial risk on bank stock returns, it is of essence to evaluate the impact of size in the relationship between financial risk and stock returns. Other than the element of economies of scale, large banks are distinct

to small banks. Laeven, et al. (2014) highlighted the distinctions of large banks to small banks into four dimensions. First, large banks were found to be prone to more leverage than small banks. This is because lenders consider large banks as too big to fail and automatic candidates for government bailouts. Secondly, large banks are prone to high leverage and this associated with inadequate capital common with large banks. Thirdly, large banks were found to be heavily diversified engaging into unbalanced market based activities. Large banks have less stable funding structure. Lastly, large banks are found to be organizationally complex making it difficult to control with precision (Kelly, et al., 2010). These reasons form the basis under which bank size server as a moderating variable in this study.

This paper sought to provide a financial and economic foundation on the discourses ongoing, relating to importance of bank size in the economy and the financial sector. The study analyzed aggregate data on bank size to establish how industry bank size affect overall impact of financial risk on stock returns. The study also assessed panel data to find out how individual bank size affect the degree of influence of financial risk on stock returns. The study also appreciated that market capitalization, customer base, revenue size and capital size are determinants if bank size. In this study bank size represents the moderator variable and was measured by bank size and operationalized as the log of bank assets (El Mehdi, 2014; Aga et al., 2013; Laeven et al., 2014)).

2.3.6 Stock Returns

The stockholders have experienced gradual deterioration of their investments since the global financial crisis. This is because stock returns in the financial market have continued to depict mutating phenomena due to financial risk which has turned to be a challenge to both regulators and investors in the banking industry (Karami & Talaei, 2013). Volatility of stock returns is of concern to portfolio managers in investment banks and pension firms as financial markets face unprecedented increase in financial risk.

Theoretical framework of modern portfolio theory demonstrate that stock return is a function of financial risk. Empirical studies have further established that the direction of relationship between financial risk and stock returns is dependent on the state of financial economy. During stable states, higher returns are associated with higher risk to compensate for the risk premium. Consequently, during periods of economic recession, increase in financial risk adversely affects bank stock returns (Michael, et al., 2001; Jing, & Kostas, 2012; Fauziah, Zarinah, Ahamed & Mohd, 2009).

Saleh (2015) demonstrates that increase in financial performance based on ROA, ROE and EPS increases stock returns. Stock returns is maximized when firms experience growth in earnings, increase in dividend yields and payouts and the general growth of a firm's assets base. Kibet, Jajongo and Ndede (2016) investigated the impact of dividend policy on share price of listed firms in NSE. They established that cash dividend is positively related to stock prices. Hussainey, Mgbame and Chijoke (2011) conducted a study on the relationship between share price volatility and dividends in United Kingdom during 1998 to 2007. Their study established that irregular dividends lead to unstable stock prices. Mehri (2015) established that earnings positively affect stock returns and volatility of earnings adversely affects stock returns. The measure of stock returns is determined by factors that influence investor's stock returns at the stock market.

From the above analysis of previous studies, it is evident that risk in financial institutions adversely affects stock returns and eventually causes financial crisis. Literature has also established that profits promotes stock returns but quick and come easy profits negatively affects stock returns in the long run. However, the triggers of excessive risk taking and desire for easy profits and how it affects stock returns need to be addressed. Stein (1989) through his model dubbed "short termism" established that although investors engage the stock market to maximize stock returns, the same stock market exerts pressure to the management to increase earnings. This supposedly increases demand for stocks in the short run. Investors in the stock market interpret current favorable earnings as a guarantee of formidable value in the future. It follows that the quickest way to increase earnings in the short run is to engage more risk. Banks loosens their lending standards and adopt a cheaper short

term funding strategy. Seru (2014) supported the idea of market pressure in destroying value at the stock market. The study finds out that public banks are characterized with higher risk taking appetite compared to private banks. Bernstein (2014) confirmed that it is the impact of listed banks that affects financial systems most compared to private banks. The study clarified that public banks are riskier than private banks as evidenced by their impact during the global financial crisis. This exposition form the reason why the study focused on the influence of financial risk on listed banks in Kenya.

In this study, stock return represents the dependent variable of the study. It is measured by the return on bank stock at time t . Stock return is the change in capital or wealth due to an investment. The changes could occur due to cash flows such as earnings, dividends, or interest or due to negative or positive change in price (Mehri, 2015). To determine stock returns the study employed the formula applied by Purnamasari et al. (2012) and Predescu and Stancu (2011) in calculating the stock returns:

2.4 Empirical Review

Having laid pre-requisite theoretical foundation and conceptual framework defining the association of variables of study; the study reviews empirical evidence on the influence of financial risk on stock returns and related studies by varied scholars.

2.4.1 Credit Risk and Stock Returns

Naser et al. (2011) conducted an empirical study to establish the effect of credit and exchange risk on stock returns conditional volatility of banks in Australia using asymmetrical and symmetrical GARCH models. The result of the research found out that there exist meaningful association between credit risk and market risk with stock return volatility. The findings of the study also established that financial risk helps to predict a stock return which is helpful to investors and regulators. Felix and Claudine (2008) carried out a study on the relationship between bank performance and credit risk management. They measured bank performance with return on asset (ROA) and Return on Equity (ROE). They measured credit risk using the ratio of non-

performing loans to gross loans. Their study established that non-performing loans are inversely related to profitability.

Hatfield and Lancaster (2000) examined an empirical paper to find out the stock market response to disclosures of loan loss provisions. They investigated a sample of 121 banks relating to loan loss provision announcements between 1983 and 1992. The study revealed a mixed reaction on the relationship between loan loss reserves announcements and stock returns. The paper concluded that abnormal stock returns was significantly negative before the event date, but significantly positive after the event but noted that the stock market behavior to loan provisions also depended on loan category and loan period.

Li and Sandeep (2007) studied the effect of stock returns on loan loss provision disclosures in Hong Kong, Malaysia and Singapore for the period 1993 to 2000. The study found there exist a positive relationship between loan provisions to stock returns and cashflows. The study established that managers increase loan loss provisions as a signal expectations of favorable cash flow positions. The study also examined the relationship between loan loss provision variable and stock returns during Asian financial crisis in 1997. It established that the association of unexpected loan loss provisions common during crisis, was significantly lower on stock returns and future cash flows relative to non-crisis periods.

Kithinji (2010) conducted a study on credit risk management on profitability of commercial banks in Kenya. The study covered the period 2004 to 2008 focusing on the amount of credit, level of non-performing loans and profitability. The study found that the amount of gross loans and non-performing loans does not influence profitability of commercial banks. The study findings implied that there could other factors that impact on bank profitability. Steiger (2010) examined the influence of implied volatility and credit risk on stock returns at the USA securities exchanges. The study used tradable credit derivatives of credit default swaps and interest rates to measure credit risk. The study build a multifactor model to establish whether credit default swaps and implied volatility are significant in explaining the behavior of stocks. The study established that relationship between credit risk and implied

volatility on stock returns is based on the relationship between credit risk and the ratio of market to book value. The study concluded that credit risk and volatility are correlated to market to book ratio of a stock and therefore the high explanatory power between credit default swaps and stock returns is not a market anomaly.

Kargi (2011) investigated the effects of credit risk on profitability of Nigerian banks for the period 2004-2008 and analyzed using regression techniques. The study concluded that increase in loans and advances, deposits and non-performing loans exposes banks to distress and illiquidity risk. The variables of loans and advance and nonperforming loans inversely influenced banks profitability. These findings inferred that credit risk management has a significant influence on profitability of Nigerian banks.

Adebawo and Enyi (2012) in their study to investigate the impact of credit risk exposure on market value of Nigerian banks for the period 2006 to 2012 at the Nigerian stock exchange. The study sought to clear doubt on the suspicion that collapse of the banking system in Nigeria was due to improper credit risk assessment. Analysis of secondary data based on linear regression model established that credit risk exposure did not have an influence on market value and profitability of Nigerian banks. However, credit risk management structure and credit loss were established to be effective predictors of credit risk exposures.

Khalid (2012) examined the impact of asset quality on Profitability of Private Banks in India over the period 2006-2011. The study established that asset quality and operating performance are positively correlated. Aghababaei et al. (2013) investigated the effects of credit risk indicators on shareholders' value of commercial banks listed in Tehran Stock Exchange- Iran. The study covered 6 years from 2005 to 2010. Using linear regression model, the study analyzed significance of loan loss provision on return on equity and concluded that credit risk indicators have a significance influence on stock returns.

Da Silva (2014) conducted an empirical investigation on the impact of sovereign credit risk measured by credit default swaps on the stock market measured by the stock prices in Portugal. The objective of the study was to establish the correlation of

credit default swap spread and stock prices. Although granger causality assessment indicated a close link between stock markets and severing credit risk; the study conclusion found out that deterioration of sovereign debt quality or increase in credit default swaps does not indicate sensitivity of the stock prices. Findings also indicated that the lead and lag relationship between sovereign debt and stock market are pronounced during stable periods.

Janssen (2012) examined the impact of credit risk on stock returns at the German, French, and Dutch stock markets for the period 2004-2012. The objective of the study was to ascertain whether systematic risk embedded on the credit spread affects stock returns. The study found out that there is no significant relationship between excess returns on stocks and credit spreads. Kang and Kang (2009) also conducted a study on the impact of individual firm credit spread and stock returns at the Korean stock market using Merton (1974) model to capture systematic risk. They argued that the notion of higher returns on firms with low credit risk than firms with high credit risk is puzzle only applicable during periods of financial distress, otherwise the mean variance theory of higher risk higher returns holds for stable financial periods. The study explains that the fundamentals of risk versus returns investor's undertaking on financial risk is compensated by an investment return premium.

Lucky and Nwosi (2015) investigated the relationship between asset quality and profitability of listed commercial banks in Nigeria for the period 1980-2013. The CAMELS criteria represented the study variables of asset quality and profitability: Non-performing loans to total loans, non-performing loans to total customer deposit, loan loss provision to total loans and loan loss provisions to total assets. The study established that non-performing loans to total loans and non-performing loans to customer total deposit had a positive relationship with return on investments. Loan loss provision to total loans and loan loss provisions to total assets had an inverse relationship with return on investments. The study concluded the existence of a significant relationship between the asset quality and profitability of commercial banks.

Million, Matewos and Sujata (2015) investigated the impact of credit risk on profitability of commercial banks in Ethiopia for 12-year period (2003-2004). The objective of study was to establish the impact of non-performing loans, loan loss provisions and capital adequacy on profitability of commercial banks. The study analyzed secondary data using descriptive statistic and panel data analytic model. The study concluded that credit risk indicators: Loan Loss provisions, non-performing loans and capital adequacy have a significant impact on profitability of commercial banks in Ethiopia.

Abu et al. (2015) undertook an empirical study to establish how credit risk affects bank profitability in Bangladesh for the period 2003 to 2013. Credit risk was measured using the ratio of non-performing loans to gross loans, ratio of loan loss reserve to gross loans, ratio of loan loss reserve to non-performing loans and capital adequacy ratio. Profitability indicators used included return on asset, return on equity and net interest margin. The study analyzed secondary data using OLS random effect model, GLS model and GMM (generalized method of moments). Their finding revealed that the ratio of non-performing loans and ratio of loan loss provisions had a significant negative effect return on asset concluding that credit risk affects banking profitability in Bangladesh. Additional analysis on the study established that implementation of Basel II accord was positively significant on profitability. Sayo et al, (2013) analyzed evidence of relationship on stock market volatility and non-performing loans for banks listed at Nigeria stock market using statistical model of Exponential Generalized Autoregressive Heteroskedasticity. The study established that there exists a positive relationship between stock market volatility and NPLs.

2.4.2 Market Risk and Stock Returns

Empirical study of Syed and Anwar (2012) examined the relationship between interest rate, exchange rate and their volatilities on stock prices of listed banks in Pakistan. Analytical investigation revealed existence of significant long run relationship between exchange rates and banks stock prices. It also revealed a significant negative short term relationship between interest rates and stock prices. However, the relationship of volatilities of exchange rate and interest rate on stock

prices were all found to be positive. The result established that market based risk of exchange rate and interest rates are crucial in making investment decisions on banking stocks. Hooy, Tan and Nassri (2004) conducted a study on the risk sensitivities of bank stock returns in Malaysia to interest rates and exchange rate movement during the Asian financial crisis. They found out that before and after Asian financial crisis, both interest rate and exchange rate factors affected bank stocks for large and small banks.

Ryan and Andrew (2004) conducted a study on market, interest rate and foreign exchange risk in Australian banking sector for the period 1996 to 2001 using GARCH-in-Mean Approach to model stock return volatility on daily Australian stock returns. They concluded that market risk, short and medium term interest rates along with their volatility area significant determinant of bank stock returns. However, it was found that exchange rates and long term interest rates are not significant in influencing Australian banks stock returns.

In an empirical estimation of systematic risk, Muiruri (2014) investigated the effects of systematic risk in equity stocks at the Nairobi securities exchange for the period 2009 to 2012. The study used securities merged into four industry sectors: Agricultural, Commercial and Services, Finance and Investments and Manufacturing and Allied Sectors. The mode of analysis used was simple regression model. The study established that there exists a relationship between systematic risk and stock returns with agricultural sector being most risky while financial sector least risky.

Hyde (2007) investigated the sensitivity of stock returns to market risk, interest rate and exchange rates in France, Germany, UK and Italy. The study established that the three risks exhibit a significant influence on excess returns and future cash flows. The study confirms the relevance of MPT by aligning the influence of diversified risk on stock returns. Wycliffe and Muriu (2014) conducted a study on the impact of macroeconomic variables on stock returns in Kenya for the period 2003-2013. The investigation concluded that money supply, inflation, exchange rates impact stock returns in Kenya. Interest rate was found not significant in determining stock returns in NSE. Foreign exchange was found to have negative effect on stock returns.

Predescu and Stancu (2011) analyzed portfolio risk in the pretext of global financial crisis using volatility models of ARCH and GARCH along three benchmark indexes of USA, UK, and Romania. The objective of the study was to establish the uncertainties in the portfolio due to financial crisis. Modelling of stock returns volatility indexes established that portfolio risk was influenced by systemic forces of the financial crisis. The study also established that diversification of the portfolio along the three indexes during the crisis did not reduce portfolio risk.

Sukcharoensin (2013) conducted a study to examine the influence of market, interest rate and exchange rate on time varying property of Thai banks stocks returns using GARCH framework. The study established that market risk is a factor of stock return sensitivity to large banks than to small and medium banks. The study also established that interest rate and exchange rate are better predictors of stock returns sensitivity of Thai banks. In the long run, large banks are seen to hedge exchange rate risk and therefore exchange rate risk does not influence their stock return sensitivity.

Mouna and Anis (2015) investigated the effect of market, interest rate and exchange rate risk on banking sector and insurance sector stock returns during financial meltdown using GARCH-in-Mean model. The study was conducted for eight countries within USA, European market and China for the period 2006-2009. The study established that market, interest rate and exchange rate positively and negatively influence the volatility of stock returns in USA, China and Europe economies during the financial crisis and concluded that risk forms a component of influencing stock return.

2.4.3 Liquidity Risk and Stock Returns

Batten and Vinh (2011) explored to find out the relationship between liquidity and stock returns at Vietnam stock market during the financial crisis for the period 2006 to 2010. The study used share turnover as a proxy of liquidity. Linear regression established that market liquidity positively influences stock returns as investors see premiums to compensate for illiquidity. The study concluded that liquidity is an important component in asset pricing and these fact is not affected by financial crisis, economic recession nor economic booms.

Dick-Nielsen et al. (2013) in their empirical study on market liquidity and funding liquidity with regards to Danish bond markets established that funding liquidity determined market liquidity and consequently, market liquidity drives market returns. The study tested for existing relationship between funding liquidity and market liquidity. The test confirmed the theory of Brunnermeier and Pedersen (2009) that suggested that there existed a causal link between market liquidity and funding liquidity. Fontaine et al. (2013) conducted a study on funding liquidity risk and the cross section of stock returns. The study established that banks diffuse funding shocks to stock returns. The study concluded that low returns are associated with stocks volatility, illiquidity and higher risk premiums.

Akram (2014) on his investigation sought to find out the effect of liquidity on stock returns for firms listed at Karachi stock exchange in Pakistan. The study took 10 companies for the period 2005 to 2012. The study adopted a market based liquidity measured by bid and ask spread compared to bank funded liquidity. The study considered liquidity as the factor that drives trading of stock at the stock exchange. It was concluded that presence excessive liquidity in the Karachi stock market reduces stock returns. Akram (2014) established that his finding was contra to that of pioneer study on liquidity and stock returns by Amihud and Mendelson (1986) who established that market liquidity is positively related to stock returns.

Mehri (2015) conducted a study on the effects of financial risk on the relationship between earnings and stock returns. The study established a significant positive correlation between earnings and stock returns. It also concluded a negative significant effect of credit risk and capital risk on stock returns but found the effect of liquidity risk on stock returns insignificant. Aga et al. (2013) researched on the association of liquidity ratios and stock returns at Tehran Stock Exchange during 2006 to 2011. The study used external factor of systematic risk and internal factor of company size as control variables. The study found that current ratio has an impact on stock returns and therefore can be used to predict stock returns.

Shen, Chen, Kao and Yeh (2009) conducted an empirical study on the relationship between liquidity risk and bank performance of commercial banks in 12 advance

economies using alternative liquidity measure of financing gap. This measure of liquidity risk was used by Saunders and Cornett (2007) as an alternative to bank liquidity ratios. Other alternative measure of liquidity risk includes cash maturity and capital positions mismatch, liquidity index and peer group ratio comparison. The study concluded that liquidity risk endogenously and significantly determines bank performance in a market based financial sector.

El Mehdi (2014) investigated the effects of bank liquidity and financial performance of the Moroccan banking sector. The study defined bank liquidity position over variety of liquidity ratios namely; liquid assets to total assets, liquid asset to total liabilities, liquid assets to deposits, loans to total assets, illiquid assets to liquid liabilities. The study conclusion defined determinants of bank performance as unemployment, bank size, bank liquidity, ratio of external funding to bank liabilities. The study remarked that impact of bank liquidity and performance depends on the model used. The study could not conclude with certainty that illiquidity is related to bank inefficiency but it confirmed that unemployment is negatively significant to bank performance. Saleh (2014) investigated the effect of liquidity risk on bank performance of Jordan banking system. The study established that loans to deposit ratio, current ratio holds a significant relationship on the banks return on equity and return on investments. In general, the study concluded that liquidity risk is an endogenous determinant of bank performance in Jordan.

Maaka (2013) conducted a study on the relationship of liquidity risk and bank performance of commercial banks in Kenya for the period 2008-2012. The findings showed that leverage and liquidity gap is negatively related to profitability of Kenya commercial banks. Abzari, Fathi and Kabiripour (2013) in their empirical study on effects of illiquidity on capital gain of Iranian market confirmed that due to short investments horizons, illiquidity characteristic is a crucial factor for capital gains growth. The study results established that illiquidity inhibits a negative relationship with capital gains. Akram (2014) studied the effects of liquidity on stock returns in Pakistan. The outcomes of the study established that liquidity holds a negative relationship with stock returns.

Chikore et al. (2014) conducted a study on the relationship between stock liquidity and returns at Zimbabwe Securities Exchange. The study used measures of market liquidity namely: bid-ask spread, trading volume and turnover. The results indicated that the volatility of stock liquidity is vital to investors since they use liquidity risk premium in pricing stocks. The study concluded that market liquidity negatively affects stock returns at Zimbabwe Stock Exchange. Lakorito, Muturu and Nyang'au (2014) conducted an assessment on the impact of liquidity on profitability of banks in Kenya. The results of the study established that liquidity holds a significant positive relationship with banks return on assets. The study described short term liquidity holdings as key in facilitating revenue generation such as meeting demand on deposits and funding of loan obligations.

Yasser and Anna (2015) investigated the influence of balance sheet based bank liquidity risk on bank stock returns. It measured liquidity risk based liquidity gap illustrating the ratio of how much liquid liabilities exceed liquid asset is covered by liquid liabilities. This study sought to illustrate that stock returns are not only a function of Fama and French factor models but also liquidity risk play a crucial role on sensitivity of stock returns. The study shows that stock of banks experiencing high liquidity risk are characterized by low stock returns and vice versa. This finding shows that bank stock returns are not influenced by anomaly but complexity of the banking system.

Chung and Ariff (2016) pursued an investigation on the influence of macro based bank liquidity funding on stock index returns from major capital markets- Japan, Canada, US and UK using 54 periods. The study established a mixed finding that bank specific factors that determine liquidity affect stock returns paltry 38% with the rest being influenced by macro factor of liquidity such as money supply. They concluded that policy framework determines the level of money supply which in turn determines the level of liquidity flowing through financial intermediation and eventually to investors to trigger demand for stocks.

2.4.4 Capital Risk and Stock Returns

Acharya, Hamid and Anjan (2010) on their study of impact of leverage change on firm value developed a model based on Modigliani and Miller Model to explain the reaction of stock returns in association with issuer exchange offers. The study established that positive debt level information influences wealth transfers across security class. Mathuva (2009) study findings supported Kenyan government bid attempt to increase bank capital to promote bank efficiency and risk resilience. The study sought to establish a relationship between Capital adequacy and cost income ratio on performance of commercial banks in Kenya. The empirical study found a significant positive relationship between tier 1 banks on the effect of core capital to risk weighted asset on profitability. The study also established a negative effect of equity capital ratio on profitability. Efficiency measured by Cost Income Ratio was negatively related to profitability.

Chen (2011) examine the influence of capital ratios on cross section of bank stock returns in Japan. The study proposed use market based capital ratios in estimating exposure of banks relative to systematic risk while at the same time accommodating for the banks share performance and size. The study found that lower market value capital ratios bears higher influence on bank stock returns than the level higher capital ratios are impacting on bank returns. This finding signify that banks with higher market valued capital ratios as subject to higher risk exposures than small market valued capital ratios.

Berger and Brouwman (2011) pursued a study on the effect of capital on bank performance during the financial crisis. The study tested the effect of capital on three aspect of bank performance namely: Profitability, Market share and survival during financial crisis and normal times. The study established that capital helps banks of all sizes increase chances of survival, boost market share and enhance profitability during crisis. In general, the study found that capital is essential always for small banks but emphasized that capital is more crucial for medium and large banks during financial crisis. Ogbulu and Emeni (2012) studied capital structure and firm value on companies listed in Nigeria Stock exchange. The empirical study established that

relationship of equity capital on value of the firm was insignificant. However, the relationship of long term debt capital on value of the firm was significant.

Wakid, Arab, Madiha, Waseen and Shabeer (2013) studied the impact of capital structure and financial performance on stock returns a case of Pakistan textile industry. The study contended that changes in capital structure and financial performance are significant to ascertain the sensitivity of stock returns. Based on their empirical findings, they concluded that capital structure and financial performance positively affects stock returns of Pakistan textile industry. Garima (2013) in his study on Capital structure decisions established a causal link between capital structure and value of the firm. He framed two hypotheses and tested with bivariate correlation technique. Cost of capital versus firm value and capital structure versus firm value. The study found the effect of capital structure on value of the firm was statistically significant. Correlation coefficient between capital structure and cost of capital was found to be negative.

Asikhia and Sokefun (2013) analyzed the impact of capital adequacy on profitability of foreign and local banks in Nigeria. Primary data showed non-significant relationship while secondary data showed a significant positive relationship between capital adequacy and bank performance. Kibet, Neddy and Koskei (2013) investigated the effect of capital structure on share prices of energy sector firms listed at the Nairobi Securities Exchange for the period 2006 to 2011. Debt, equity and gearing measured capital structure of energy firms. Multiple linear regression was employed for the cross section of panel data. The study established that equity capital is significant but bears a negative effect on stock prices; debt and gearing ratio were significant determinants of share prices.

Shahryar and Laleh (2015) studied the impact of capital structure on bank performance in Iran and established that capital structure affects earnings per share positively while it affects return on assets negatively. The study found that there was no significant effect of capital structure on return on equity. Annas and Mohamoud (2013) investigated the effect of financial leverage and systematic risk on stock returns for industrial sector at the Amman stock exchange for the period 2000 to

2009. Systematic risk was measured by beta coefficient while debt ratio measured financial leverage. The study was analyzed using linear regression model and established that systematic risk and financial leverage influence 4.4% of the variability in stock returns of the industrial companies listed in the Amman stock exchange which was determined by the study as a negligible effect.

Nurazi and Usman (2016) sought to determine whether bank stock returns responds to CAMEL ratio financial fundamentals and macro-economic factors. The study based its context in Indonesia for the period 2002 to 2012. The study used pooled least square model to analyze panel data to ascertain whether capital adequacy, loan to deposit ratio, non-performing loans, cost income ratio, return on equity, net interest income, interest rate and exchange risk and inflation rate influence stock returns. The study results found that loan to deposit ratio and return on equity are positively related to stock returns. Cost income ratio, interest rate and exchange rate were found to be negatively significant on stock returns. Capital adequacy ratio, ratio of non-performing loans and net interest margin were found to have to significant effect on bank stock returns.

Jheng et al. (2018) performed an inquiry on the possible relationship between capital adequacy and stock prices of Malaysian commercial banks. The inquiry was done for the period 2005 to 2014. The study inquired to establish whether compliance to Basel provision on capital adequacy by commercial banks was affecting the stock market activities. Capital adequacy was measured by the ratio of risk weighted assets. Linear regression was used to analyze data of 8 listed commercial banks. The results indicated that capital adequacy ratio did not have any impact on banks stock price. This signified that adoption of Basel previous were insignificant to influence decision making organs at the stock market.

Noor and Rosyid (2018) sought to find reliable information for investments in stocks. The study undertook to research the effect of capital adequacy ratio, loan to deposit ratio and return on equity on share price of commercial banks in Indonesia. Using linear regression model the study analyzed secondary data for the period 2011-2016. The study established that jointly, capital adequacy, loan to deposit ratio and return

on equity influence stock price by 57%. Individual analysis of the variables established capital adequacy and loan to deposit ratio was significant on bank stock prices. Return on equity was regressed individually was found to be insignificant.

2.4.5 Bank Size and Stock Returns

The empirical studies on the impact of bank size on bank stock returns has had a raft of controversy as to whether large banks are more likely to be exposed to systemic risk compared to small banks. It is argued that large banks have diversified portfolios with huge capital making them more resilient to financial risk hence attract high stock returns. Gandhi and Lustig (2010) evaluated the relationship of bank size and stock returns as an anomaly. The study investigated size anomalies on bank stock returns for US banks. The study established that large banks return lower returns compared to small and medium size banks. The study also noted that although large banks are systematically important, they are significantly more levered than small banks making them more sensitive to government bail outs.

According to Vinalis, Surti, Narain and Chow (2013) determining the optimal bank size to influence and safeguard the returns due to investors remains a mystery. Their study observed that large banks played a catalyst role during the global financial crisis due to their complexity, global interconnection and engagement in market based activities. They also found that large banks are not only systematically important, they are also prone to high leverage and unstable funding. The study concluded benefit of economies of scale in large banks is modest given the systemic risk.

Mazviona and Nyangara (2014) sought to establish the effect of firm size on stock returns for the firms listed at Zimbabwe stock exchange for the period 2009 to 2013. The study measure firm size through an assorted portfolio of 5 stocks for all 64 listed companies at the Zimbabwe stock exchange constituted with market capitalization values. A regression model was executed for size and stock returns which established positive but insignificant effect of bank size on stock returns. These findings were contra to most empirical findings that large firms exhibit lower risk adjusted returns compared to small firms.

Laeven, Ratnovski and Tong (2014) investigated the relationship between bank size and systematic risk. The study established that large sized banks enjoy economies of scale, diversification and reduced risk. With low risk, large banks can operate with thin capital margins. This analogy makes large banks profitable than small banks during stable economic time. During recession, large banks are vulnerable to unstable funding and risky market activities. Based on these contradictions between large and small banks, policy implications have been suggested to optimize the benefits of large banks and minimize the implications of their down fall. Policies on capital surcharge, restriction on market based activities and strategies to manage the myth of too big to fall have been advanced (Claessens et al., 2011)

Aga et al. (2013) researched on the association of liquidity ratios and stock returns at Tehran Stock Exchange during 2006 to 2011. The study used systematic risk and company size as control variables. The study concluded that both systematic risk and firm size carries a meaningful positive impact on stock returns. Contrary to positive association of bank size to stock returns, Shariat and Khosvari (2008) in their study on impact of stock returns due to size, market factor and book to market ratio, established that firm size hold a negative relationship with stock returns.

Bhattarai (2014) in an empirical investigation sought to establish the determinants of share price of listed banks at Nepal stock exchange for the period 2006 to 2014. The study proposed earning per share, price-earnings ratio, dividend yield and size measured by the log of bank assets as the determinants of share price. Using linear regression model, the study established that earning per share, price-earnings ratio were positively significant determinants of share price. Divided yield was determined to be negatively significant on share price. However, bank size was established to be positively insignificant on ban share price

Fafri et al. (2009) and El Mehdi (2014) used bank size measured by log of average assets as a control variable. The studies concluded that as bank size promotes profitability as a result of economies of scale and ability to handle financial risk. These determinants influence stock returns positively. For banks, Stable and wider asset base characterize higher profitability resulting to higher stock returns. Aga, et

al., (2013) remarked that company size is main cause of variability on shareholder value maximization. In this study bank size is operationalized as the log of bank assets.

2.4.6 Financial Risk and Stock Returns

Sobia et al., (2015) undertook to investigate the effect of financial risk on the sensitivity of stock returns. The study was conducted during the year 2003 to 2012 based on the data of 115 companies at Karachi Stock Exchange in Pakistan. It focused on financial risk at industry level, firm specific level and to the risk of exporting and non-exporting firms. Stock return was used as dependent variable while independent variable of financial risk measured by interest rate, exchange rate, financial exposure, and total risk were employed. Firm size was used as a control variable. The study findings concluded that interest rates and exchange rates at industry level and firm level hold a negative significant relationship with stock returns while total risk, growth rate, firm size and financial exposure was found insignificant on industry and firm level. Interest rates held a positive significant relationship on stock returns for exporting and non-exporting firms while exchange rate held a negative significant relation for the same group.

Lewellen (2007) investigated the predictive capacity of financial ratios on aggregate stock returns. The study conclusion revealed that during the period 1946-2000 in the USA financial market, dividend yield influenced the prediction of stock returns. Study findings also established that earning to price ratio, book to market ratio predicted stock returns during the period 1963-2000. Similarly, Karami and Talaei (2013) investigated stock return predictability using financial performance of book to market value, price to earnings, capital gain and dividend yield. The results indicated capital gain and book to market value significantly predicts market returns.

Naser et al. (2011) conducted a study to investigate the effect of credit and exchange risk on stock returns of listed banks in Australia using GARCH family models. The study established that credit risk and market risk influence the behavior of stock returns. In all GARCH patterns, financial risks coefficients were found positive for a one lag period. The study concluded that credit risk and market risk significantly

positive in influencing bank stock returns and therefore the financial risk was useful tool for investors in return maximization.

Haque and Wani (2015) undertook to examine the relationship between financial risk and financial performance of Indian banks. The study also investigated the influence of financial risk on financial performance of Indian banks. Financial risk was defined as interest rate risk, liquidity risk, credit risk, capital risk and solvency risk. The findings established all financial risk studied depicted a relationship with financial performance. The study concluded that solvency risk, credit risk and capital risk significantly influenced financial performance while interest rate and liquidity risk was insignificant to financial performance.

Al-Eitan and Al-Oleenat (2015) studied the causal relationship of financial ratios and financial market index. Based on the findings, price to earnings, price to book value and dividend yield ratios of financial performance significantly influenced the performance of financial market index. Saleh (2015) investigated of the association of financial performance with stock returns of gas and oil industry in Pakistan. The results revealed that ROA and net profit margin exhibit a negative influence on returns while ROE exhibits a slight but positive influence over stock returns.

Mehri (2015) investigated the effects of financial risks (liquidity risk, credit risk, and solvency risk) on the relationship between earnings and stock returns. The findings revealed that there exists a significant positive relationship between stock returns and earnings. Additionally, credit risk and solvency risk has a negative effect on the relationship between earnings per share and stock returns. Liquidity risk was found to have insignificant effect on the relationship between earnings per share and stock returns.

Purnamasari et al., (2012) conducted an empirical research on the effect of financial risk and growth on the relationship between earnings and stock returns. Preliminary findings established that earnings were negative and significantly related to stock returns. This was due to volatility of EPS causing investors to react adversely to bank performance. Solvency risk exhibited a significant relation to earnings and finally to

stock returns. The effect of liquidity risk and credit risk proved insignificant to relationship between earnings and stock returns.

Fauziah et al., (2009) investigate the influence of financial risk on the performance of conventional and Islamic banks in Malaysia for the period 1996 to 2005. The study measured of financial risk based on measures of credit risk, liquidity risk and interest rate risk while bank performance was measured using ROE and ROA. Bank size was incorporated in the study as a moderator. The study found credit risk influence bank performance in both conventional and Islamic banks while liquidity risk was found to be insignificant. Interest rate risk was established to be slightly significant on conventional banks but insignificant on Islamic banks.

Ndwiga and Muriu (2016) conducted an empirical enquiry on stock return volatility at Nairobi securities exchange for the NSE 20 share index for the period 2001 to 2014. The study objective was based on modeling asymmetric and symmetric volatility models on stock returns at NSE. The study established the increased volatility was compensated with the risk premium for the NSE20 share index returns. The study found zero leverage effects on stock returns due to positive and negative news. The study also established that advancement at Nairobi securities exchange such as cross listing, reduction of settlement cycle and introduction of live trading has reduced volatility for NSE 20 share index returns.

Tah (2013) conducted a study on the association of volatility and expected returns; a comparison study of Kenya Nairobi Securities Exchange and Zambia Lusaka Stock Exchange. The study employed GARCH-in-Mean Model and established an inverse and significant relationship between conditional volatility and stock returns in Lusaka Stock Exchange. The relationship for Nairobi Security exchange between stock returns and conditional volatility was found insignificant implying volatility risk was not relevant for the market during the period. Waititu et al., (2013) analyzed volatility of NSE stock returns on daily returns series from 9th June 2008 to 31st December 2010 using Safaricom and Kenya Commercial Bank (KCB) daily returns. The study used ARIMA-ARCH/GARCH models and established ARIMA (1, 0, 0),

GARCH (1,1) and ARIMA (0,0,2), GARCH (1,1) for Safaricom and KCB respectively best fitted the model.

2.5 Critique of Existing Literature

Sobia et al. (2015) undertook to investigate the effect of financial risk on the sensitivity of stock returns. The study was conducted during the year 2003 to 2012 based on the data of 115 companies at Karachi Stock Exchange in Pakistan. The study focused on financial risk at industry level, firm specific level and that of exporting and non-exporting firms. Stock return was used as an independent variable while independent variable of financial risk was represented by interest rate, exchange rate, financial exposure, and total risk. Firm size was employed as a control variable. The study findings concluded that interest rates and exchange rates at industry level and firm level hold a negative significant relationship with stock returns while total risk, growth rate, firm size and financial exposure was found insignificant on industry and firm level. Interest rates held a positive significant relationship on stock returns for exporting and non-exporting while exchange rate held a negative significant relation for the same group.

The study of Sobia et al. (2015) established an elaborate effect of financial risk on stock returns with regards to non-financial firm but failed to generalize that the study findings could be applied to financial sectors and more so to developing countries. The study explicitly accounted for market risk but failed to specify credit risk, liquidity risk and capital risk. The study failed to show GARCH model can be used to analyze the relationship between financial risk and stock returns. It is therefore the objective of this study to fill this gap.

Mehri (2015) undertook an empirical study on the intervening effect of earnings per share on the relationship between financial risk and stock returns at the Tehran Stock Exchange. The study sampled 65 companies for the period 2008 to 2013. Financial risk was defined by credit risk, solvency risk and liquidity risk. Using multiple linear regression model, it was found that earnings per share held a significant positive relationship with stock returns. It was also observed that solvency risk and credit risk

held a negative and significant relationship with stock returns. The impact of liquidity risk was found insignificant.

The study of Mehri (2015) being based on non-financial firms recommended similar study on the financial sector firms. The study was conducted at the peak of global financial crisis. A study based on a longer period such as 10 years factoring pre-and post-global financial crisis period is necessary to re-establish the actual impact and direction of financial risk to stock returns. The model of analysis of multiple linear regression model could be enriched with GARCH model of analysis since the variables of analysis are time series. The study failed to recognize the effects market risk as one financial risk affecting firms. The study also failed to analyze the effect of firm size on influence of financial risk on stock returns. These gap forms the basis of this study.

Al-Tamimi et al. (2015) examined the relationship between credit risk, market risk, liquidity risk, operational risk and capital risk and financial performance measured by ROA and ROE of Gulf Cooperation Council (GCC) Islamic banks over 12 years. The study employed a regression analysis on 11 out of 47 banks for the period 2000-2012. The study established the existence of a negative significant relationship between financial risk and bank financial performance with capital risk and operational risk proving to be the most critical financial risk on GCC Islamic banks. However, the relationship of various individual financial risks on financial performance has been over research with minimal attention being accorded to relationship of combined financial risk on financial performance. Little has been done on the influence of financial risk on stock returns. In Kenya, the studies on influence of financial risk on stock returns need to be explored. This gap defines the basis of this study.

Ouma and Muriu (2014) examined the effect of macro-economic fundamentals on stock returns at the Nairobi Securities Exchange in Kenya for the period 2003-2013. The study investigated the effect of money supply, exchange rate, inflation rates, and interest rates on NSE 20 share index. Ordinary least Square method was used to test the relationship of different macroeconomic factors on stock returns. Money supply

and inflation were found to have a positive significant impact on stock returns. Exchange rate was found to be negatively significant to stock returns while interest rates were found to be negatively significant. The study failed to specify how stock returns of specific sectors such as banking sector are affected by both systemic and non-systemic. This study intends to fill this gap.

Purnamasari et al. (2012) conducted an empirical research on the effect of financial risk and growth on the relationship between earnings and stock returns at Indonesia stock exchange during 2008 to 2010. Preliminary findings established that earnings were negative and significantly related to stock returns. This was due to volatility of EPS causing investors to react adversely to bank performance. Solvency risk exhibited a significant relation to earnings and finally to stock returns. The effect of liquidity risk and credit risk proved insignificant to relationship between earnings and stock returns. This study failed to factor other sources of financial risk such as market risk; the study was also based on a short period of two years during the financial crisis for which findings cannot be generalized to accommodate impact for a longer period. The study also failed to factor bank size for moderating effect.

Haque and Wani (2015) undertook to examine the relationship between financial risk and financial performance of Indian banks. Financial risk was defined as interest rate risk, liquidity risk, credit risk, capital risk, and solvency risk. The findings established all financial risk studied depicted a relationship with financial performance. The study concluded that solvency risk, credit risk and capital risk significantly influenced financial performance while interest rate and liquidity risk was insignificant to financial performance. The study failed to analyze the effect of financial risk on stock returns. It also failed to account for the effect of bank size on the influence of financial risk on financial performance.

Cheng and Nasir (2010) investigated the effect of financial risk and earning response to abnormal stock returns of fourteen commercial banks listed in China stock exchange for the period 2002 to 2008. The study sought to determine the effect of seven financial risk factors: interest rate, exchange rate, credit risk, solvency risk, stock risk, market risk and liquidity risk on stock returns. The study established only

liquidity risk provided a significant to earnings while all the other financial risk was not significant although earnings remained a strong predictor of stock returns. These findings indicated that investors do not care about risk as long as banks remain profitable. The study failed to incorporate bank size to moderate the effect of financial risk on stock returns. The study also failed to use different models such as GARCH volatility models to conclude that the rest of the financial risk measures are insignificant on stock returns sensitivity.

Empirical studies are yet to provide a convincing causal link on influence of credit risk on stock returns. It has been evidenced from several researchers such as Felix and Claudine (2008), Kargi (2011), Steiger (2010), Abu et al. (2015) that credit risk has a significant negative impact on stock returns. There is agreement that credit risk stands out as the most critical risk affecting commercial banks' balance sheet items. Conversely, researchers such as Kithinji (2010), Da Silva (2014), Janssen (2012) established a contra view that credit risk has positive or no impact on stock returns and financial performance. These mixed results and different views from varied scholar's forms the basis of this study.

The literature review on influence of market risk on stock returns affirms a significant negative influence of interest rates and exchange rate on stock returns as evidenced by the studies of Syed and Anwar (2012), Hooy et al. (2004) and Hyde (2007). However, Ryan and Andrew (2004) established that long-term interest rates are not significant on stock returns. Syed and Anwar (2012) established long term interest rates and exchange rates are significant while Wycliffe and Muriu (2014) established exchange rate to be significant to stock returns while interest rate is insignificant. This mixed evidence from different economies and scholars creates more confusion creating need of further research.

With regards to empirical studies on the influence of liquidity risk on stock returns, Dick-Nielsen et al. (2013), Fontaine et al. (2013), Saleh (2014) enumerated that funding liquidity risk negatively affects influence stock returns, bank performance and stock market performance. Contra to the above findings, Mehri (2015) established non-significance of liquidity risk on stock returns. El Mehdi (2014)

asserted that the impact of liquidity risk on bank performance depend on model used. The impact of liquidity risk on stock returns in developing countries like Kenya need to be established in relation to the findings from developed counties.

2.6 Research Gap

Contextual, Conceptual, and methodical research gaps have been examined and filled by this study. Contextual gap is evidenced by inadequate studies on the influence of financial risks on stock returns in Kenya. Similarly, studies on effect of single financial risk on stock returns is still isolated. In Kenya, most studies have focused on the effect of financial risk on bank financial performance. This study includes: Maaka (2013), Kithinji (2010), Lakorito et al. (2014), Mathuva (2009) and Muriithi (2016). Evidence of banking sector the influence of systemic risk stock returns in Kenya is still isolated even though banking sector in Kenya remain the most sensitive and active sector at NSE. A gap from the existing literature is that no study has considered the influence of combined financial risk (Credit risk, market risk, liquidity risk, capital risk) on stock returns in Kenya. Besides this study, no study has selectively tested the predictive ability of stock returns volatility on stock returns of the Kenyan banking sector. This study addressed this contextual gap.

Conceptual gap in this study is evidenced by mixed reactions and inconclusive findings from the previous empirical studies. This study provides more clarity on influence of financial risk on stock returns. The study established that credit risk influences stock returns. While past studies focused on market based measure of credit risk determined by variability of derivative instruments such as credit default swaps, this study adopted a balance sheet internal based approach measure of credit risk determined ratio of non-performing loans and the ratio of loan loss provision. In establishing influence of market risk on stock returns, the study advanced market risk measure of beta under CAPM by Sharpe (1964) and adopted macro-economic beta risk factors of interest rates and exchange rates as recommended by APT under Ross (1976). On the influence of liquidity risk on stock returns, the study used bank liquidity to measure liquidity risk away market liquidity articulated by Amihud and Mendelson (1986). Dick-Nielsen et al. (2013) enumerated bank funded liquidity and

market liquidity as adequate measures of liquidity risk. The study also factored the moderating effect of bank size on the influence of financial risk on bank stock returns and modelled stock returns volatility for listed banks in Kenya to establish whether increase in systemic risk on listed banks stocks is compensated by a risk premium. The above aspects established conceptual gap addressed by this study.

The methodical research gap arises given most studies establishing influence of financial risk on stock returns employed traditional linear regression analysis. The used multiple data source to establish whether financial risk influence bank stock returns at NSE. The study used linear regression (OLS) model on primary data and GLS non-linear model to analyze secondary data. The study also employed fixed and random effects model to control endogeneity bias between banks and establish long term and short term influence of financial risk on stock returns. The study further sought to established the influence of financial risk on stock returns using GARCH Model. GARCH helped the study to model the stock returns volatility and its influence on stock returns. Unlike other studies that have concentrated on one model of analysis, this study focused on four models of analysis characterizing different conditions upon which that financial data presents itself. OLS model, GLS non-linear model, fixed and random effect model and GARCH model were found individually and collectively effective to achieve the overall objective of study to establish influence of financial risk influences stock returns. Similarly, the four models used in the analysis provides a good assessment on the supremacy of methods of analysis.

2.7 Summary

In this chapter, the researcher has reviewed theories related to relationship between financial risk and stock returns. Theories have been linked with research objectives to improve the body of knowledge, enhance significance and relevance of the study in line with existing theories. The study has also been represented by a conceptual framework highlighting the association between independent, moderating and dependent variables and the linkage in describing the problem under investigation. Lastly, the researcher has described stock returns at global, African and Kenyan Context. Criticism and omissions from empirical literature has been highlighted

which lays the justification to study the influence for financial risk on stock returns of commercial banks listed in NSE. Finally, the chapter established the gaps filled by this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the universal principle or philosophy that guides research (Dawson, 2009). Research methodology is a structure which contextualizes a research procedure in a classic situation to direct it (Babbie, 2002). This chapter offers the steps and methodologies that were followed in executing the study. It discusses the research philosophy, the research design, the study population, the sampling frame and techniques, data collection procedures, pilot study and data analysis procedures.

3.2 Research Design

The purpose of research design in research is to describe and justify the research methodology used by the researcher (Dawson, 2009). Research design is the overall framework of providing answers to research questions under the study and obtaining solutions for difficulties encountered in the research process (Polit & Beck, 2003). Creswell (2003) defined research design as an all-inclusive process of research from idea conceptualization, literature review, approaches of research methodology and writing of research conclusion. Blumberget et al. (2011), referred to research design as the blueprint and structure convinced to find answers to research questions and hypothesis of interest.

This study employed descriptive survey, correlational research and panel research designs. Descriptive survey design establishes the status quo. Correlation design describes the relationships between the variables while panel design is used to measure the subsets of the population at more than one point in time to establish longitudinal changes and stability of variables of interest. Descriptive research survey refers to a systematic method of acquiring information from a representative sample about their characteristics, attitudes, opinions through questionnaires, interviews observations with a goal of learning the characteristics of a population. The researcher summarizes responses with frequencies counts, percentages and other

statistical indexes and then draws inferences on a population (Lavrakas, 2008). Kothari (2004) explains descriptive survey design as one that precisely depicts characteristics of an individual, group or situation. Descriptive research design of a correlation type has been used in other similar studies. Mehri (2015) used descriptive correlation research design in the analysis of effects of financial risks on the relationship between earnings and stock returns. Muriithi (2016) used panel data research design to establish the influence of financial risk on bank performance. Considering above descriptions, definitions and justifications, descriptive survey and correlational research design were chosen as the appropriate designs for this study.

3.3 Research Philosophy

A research philosophy is a paradigmatic foundation that directs how one views the world (Houser, 2011). This study was anchored on Epistemology; a branch of research philosophy concerned with the origin, nature, methods, limits, and validation of knowledge on social reality. Epistemology attempts to provide answer to the what, the how and the can we know aspects of social reality. Positivism is an epistemology position that generally informs research by advocating the application methods of natural science to study social reality. Through positivism the study attempted to uncover the truth about how things are or what they focus on (Bryman & Bell, 2003). The study further took a post- positivistic position which refines beliefs and views of positivism. It acknowledges values, background knowledge, hypothesis, theories, and inferences of research based on the observations (Bryman & Bell, 2003).

3.4 Study Population

The study population is a whole group of elements sharing common feature with relation to the study (Zikmund, 2010). Lavrakas (2008) described study population as an infinite or a finite collection of elements of study phenomena.

Target population comprised of all 43 commercial banks licensed by the Central Bank of Kenya in operation as at 31st December 2015. Accessible population comprised of 11 commercial banks licensed by CBK and listed in NSE. Accessible

population was also comprised of management cadre of employees of 11 commercial banks listed at the Nairobi securities exchange licensed as at 31st December 2015. According to CBK supervision report (2015), bank management cadre comprised of 10,310 managers which forms 28% of total employees in banking sector (36,212). CBK market share analysis for 2015 classified 7 large banks with 58.2% market share of which all of them are listed banks; 12 medium banks were classified with market share of 32.4% of which 4 of them are listed and 21 small banks with market share 9.4% with none of them listed. This Analysis excluded Chase banks and Imperial bank which were under receivership. It also excluded charterhouse bank which is under statutory management.

Table 3.1: Population of Managers from Listed banks using CBK market Share Index

Peer Group	Market Share	Banks in Peer group	Banks listed in Peer Group	Managers in peer group	Number of managers of listed banks in peer group
Large	58.20%	7	7	6000	6000
Medium	32.40%	12	4	3340	1113
Small	9.4	21	Nil	970	Nil
Total	100%	40	11	10310	7113

Source: CBK bank Supervision Report (2015).

Using CBK market share index analysis, the population of listed bank managers constituted of 7,113 managers as at 31st December 2015 (Kiragu, et al., 2015). The study considered managers and other senior employee's appropriate respondents because they are the custodians of financial risk and therefore responsible for defining the risk appetite of banks. They are also better placed to understand how financial risk relates with stock returns.

According to banking survey report (2015) listed banks share of the total banking industry accounts for an average of 79.1% in profitability, 71.6% in asset base, 75.1% in total net advances, 72.1% in total deposits and 73.4% on total bank accounts. These performance indicators demonstrate that listed bank drives the

banking sector in Kenya and therefore a study focusing on listed banks forms a significant sample to generalize the findings for the Kenyan banking industry.

Table 3.2: Listed Banks Share of the Banking Industry

Indicator /Year	PAT	Asset Base	Advances	Deposit	Accounts
2008	75.00	65.90	71.20	66.00	83.50
2009	75.40	65.60	72.70	68.30	82.30
2010	74.50	74.80	77.20	73.50	82.20
2011	80.20	73.90	77.70	74.90	83.70
2012	83.50	74.10	77.40	74.00	79.70
2013	81.10	72.70	76.10	73.00	63.00
2014	81.20	72.50	74.30	72.30	57.20
2015	82.00	73.00	74.00	75.00	60.00
Year Average	79.10	71.60	75.10	72.10	73.40

Source: Bank Survey (2016)

3.5 Sample and Sampling Technique

Lavrakas (2008) defined a sample as a subset of the elements drawn from the population. Sampling saves time and money by avoiding the collection of wasteful too much data. Since the sample might not adequately reflect the population traits, behaviors, symptoms or beliefs; there is need to choose the appropriate sampling procedure since the quality of the sample depends on how well it represents the population (Polit & Beck, 2003).

The study assumed stratified purposive sampling technique. Kothari (2004) describes purposive sampling as an objective selection of sample within sample elements which best represent the population. The objective of purposive sampling is to come up with a sample that best represent the population.

Polit and Beck (2003) described a sampling frame as a list of elements of the population from which a sample is chosen from. The sampling frame of this study consisted of all commercial banks listed at the Nairobi securities Exchange as at 31st December 2015 as outlined in Appendix II. The sampling frame also entailed a list of managers in key risk departments of listed banks at the Nairobi Securities Exchange as at 31st December 2015 as outlined in table 3.3.

3.5.1 Sampling for Secondary Data

The sample of secondary data comprised of 9 commercial banks listed in Nairobi Securities Exchange between years 2006 to 2015. They include Barclay, CFC Stanbic, Diamond Trust, Equity, Housing Finance, Kenya Commercial Bank, National Bank of Kenya, National Industrial Credit Bank (NIC) and Standard Chartered. The study dropped the effects of corporate events such as M&A and rights issues around the announcement dates with an event window of ± 10 days. This is because corporate events contain temporary effects on stock returns which are not related to financial risk (Shah & Arora, 2014).

3.5.2 Sampling for Primary Data

Stratified purposive sampling was conducted to select managers working in key risk affiliated departments of the listed banks. The departments include: Credit department, Operations department, Finance department, Risk department and Treasury department. These departments are chosen because of the nature of their functions with regards to financial risk. Managers in these departments are assumed to be well versed with the relationship and effect of financial risk on stock returns. The study focused on Head Office of listed banks. In this study, the unit of analysis was commercial banks listed bank at NSE. The sample was determined by sampling formula adopted by Mugenda and Mugenda (2003). This is a statistical model for

selecting a sample from a population of more than ten thousand. The model equation is as shown below:

Equation 3.1: Equation on Sample Size Formula

$$n = (z^2pq)/d^2$$

Where: n is the desired sample size when the target population is > 10,000; z is the standardized normal deviations at a confidence level of 95% which is 1.96; p is the proportion in the target population that assumes the characteristics being sought where in this study a 50:50 probability basis is assumed; q is the balance from p to add up to 100%. That is 1-P, which in our case was 1- 50% (0.5); d is the significance level at 95% confidence level. The significance level is 0.05. The sample for this study was derived as follows:

$$n = (1.96^2 \times 0.5 \times 0.5)/0.05^2 = 384$$

Target population in this study was 7,113 managers which was less than 10,000, thus the sample of 384 was adjusted using the formula below by Mugenda & Mugenda (2003).

$$n_f = n/(1+n/N)$$

Where n_f is the desired sample size when sample size is less than 10,000 and n is the sample size when the target population is more than 10,000. N is the population size

$$n_f = n/(1+n/N) = 384/(1+384/7113) = 364$$

Table 3.3: Sampling Distribution

No	Bank	Departments							Total
		Tier	Credit	Operations	Treasury	Finance	Risk	Other	
1	KCB	I	6	6	6	6	6	4	34
2	Co-operative Bank	I	6	6	6	6	6	4	34
3	Equity bank	I	6	6	6	6	6	4	34
4	Barclays Bank	I	6	6	6	6	6	4	34
5	Standard Chartered Bank	I	6	6	6	6	6	4	34
6	CFC Stanbic bank	I	6	6	6	6	6	4	34
7	Diamond Trust	II	6	6	6	6	6	2	32
8	I & M	II	6	6	6	6	6	2	32
9	CFC Stanbic bank	II	6	6	6	6	6	2	32
10	National Bank	II	6	6	6	6	6	2	32
11	Housing Finance	II	6	6	6	6	6	2	32
Total Sample									364

The Sampling distribution table 3.3 outlined how the sampling technique was used to sample managers from each department with a minimal margin of error.

3.6 Data Collection Instruments

The study used primary and secondary data collection instruments.

3.6.1 Primary Data

Primary data is fresh data collected from its original form (Kothari, 2004). Primary data was administered through questionnaires to managers of listed banks as at 31 December 2015. Mugenda and Mugenda (2003) described a questionnaire as a data collection and measuring instrument that detail a set of questions in sections to a definite order in a printed form. This study outlines the questionnaires in seven sections to address specific objectives.

Kothari (2004) outlines the advantages of questionnaires as follows: they are low cost with a large population on a wide geographical coverage, they are free from interviewer bias, they give respondents adequate time for well thought out responses, they are ideal since unapproachable respondents can be reached easily. The

disadvantages of questionnaires include they are subject to low return based on completed questionnaires, they can result to non-response bias to some questions and the willing respondents may not be a good representative of the sample. With reliance of the advantages and the need to gather data representing a large population, questionnaires were administered to bank managers of listed banks in Kenya to ascertain the constructs of financial risk and stock returns.

3.6.2 Secondary Data

Cooper and Schildler (2014) described secondary data as past information obtained by the researcher from books, articles, or reports. Annual data for ten years for the period 2006 to 2015 was obtained from KNBS, NSE, CBK, Listed financial institutions historical financial statement and Banking surveys manuals. Monthly data for external based financial risk for the period January 2006 to December 2015 was also obtained for modeling systemic risk on stock returns. Residual modeling is also referred to as stock return volatility modeling. Monthly data was used to provide large data required to accommodate volatility clustering a condition necessary for volatility modeling.

Data was obtained from CBK to show the rate of change on 91-day Treasury bill rate, rate of change of exchange rate between the USD and Ksh. Data from financial institutions was used to provide ratios that describe respective financial risks. Data on Nairobi securities exchange was used to show the stock returns for the listed banks while banking survey manual and financial institution reports was used to give financial performance indicative ratios.

3.7 Data Collection Procedure

The process of research entailed primary and secondary data sources. The study adopted method of data collection based on quantitative and qualitative data collection approaches. Quantitative approach is a technique that focuses on collecting and analyzing data based on numbers and statistical methods. It emphasizes on test and validation of reason and facts and is appropriate for large sample. It is ideal for survey and experimental research designs. Qualitative approach is a technique of

collecting data which emphasis on understanding the respondents view in a more detailed manner. It helps to hypothesis ideas and compliments the results and interpretations from quantitative approach (Wellington, 2000). The researcher employed drop and collect later technique in obtaining data from 364 managers of listed banks.

3.8 Pilot Study

A pilot test should constitute at least 5% to 10% of the sample (Creswell, 2003). Cooper and Schildler (2014) defined pre-testing as rehearsal and a replica of the main research survey. They recommended the pre-testing of the questionnaire before data collection. They also described the benefits of pre-testing as a means to increase the need of the respondent to volunteer information freely, to polish the questionnaire from undetected problems and to improve the overall quality of data to be collected.

According to Babbie (2002) questionnaire pre-testing is meant to increase instruments reliability and validity. Dawson (2002) indicated that the purpose of pilot testing is to establish whether the question will help yield the required output of study. The study employed 36 respondents, 6 in each of the 5-key financial risk department and 6 in other departments. 36 respondents for pilot study is within the rule of thumb of 5% to 10% of what the target sample should constitute in the pilot test (Creswell, 2003; Cooper & Schindler, 2014).

3.8.1 Reliability of the Instrument

Reliability of the questionnaire is the ability of the instrument to give constant response always if the same inducement is applied. It is the consistency of the answers the respondents give in relation to the same query (Cooper and Schindler, 2014). This means that an instrument should exert the same quantitative measure with respect to a variable, every time it is administered to similar variable (Babbie, 2002). As the random error decrease, reliability will increase (Cooper & Schindler, 2014).

Reliability test used 36 questionnaires on pilot study. This was stratified on 5 key departments: Treasury, finance, risk, credit, operations and all other remaining departments combined since they are also embedded with elements for financial risk. The selected managers in the pilot study were not included in the final study sample (Creswell, 2003).

Reliability of instruments in research can be tested using various techniques such as test-retest, inter-rater technique, split half and other established techniques or formulas whose output is numerical index (Bhattacharjee, 2012). In this study, reliability test of internal consistency was done using Cronbach's alpha which is efficient and cheap to administer. Cronbach's alpha was successfully used by Aluoch et al. (2014) and Kiragu et al.(2015). Cronbach alpha coefficient range from 0 to 1 with co-efficient of 0.7 and above being recommended (Cooper & Schindler, 2014).

3.8.2 Validity of the Instrument

Questionnaire validity could be internal or external. External validity refers to the capability of data to be generalized cross different context while internal validity is the capability of the instrument to measure what it is supposed to measure (Cooper & Schindler, 2014).

Cooper and Schindler (2014) categorise validity into three three major types. Content validity, criterion-related validity and construct validity. Content validity refers to the inclusivity of the different meanings within the relevance of the concept, while construct validity involves an approximation to validate measures of behaviours that cannot be observed directly (Babbie, 2002). Construct validity relies on the logical relationship among variables. This study employed content validity and construct validity, which can be evaluated through judgmental discretion and panel assessments. The questionnaire was subjected to thorough evaluation by two financial risk experts from the Global Association of Risk Professionals, Kenyan chapter, to enrich content validity. Confirmatory Factor Analysis was conducted to test construct validity (Cooper & Schindler, 2014).

3.9 Data Analysis and Presentation

3.9.1 Data Analysis

Data processing and analysis is described as the technique in which data is ordered, arranged, and organized to extract objective information (Saunders, Lewis & Thornbill, 2009). This section discusses the techniques used for data analysis and hypothesis testing. The techniques employed include OLS method for primary data. Despite departures of its underlying assumptions OLS model was found simple, natural, unbiased estimators and robust model ideal for modeling asymptotically normal sampling distribution of primary data (Hayashi, 2000). Muiruri (2014) used linear multiple regression in an empirical review of estimating systematic risk in Equity stocks at NSE. Akram (2014) also used multiple linear regression in his study on effects of liquidity on stock returns. SPSS Version 21 software package was used to aid descriptive and inferential analysis for primary data.

GLS model was used to analyze aggregate annual secondary data. It is worth noting that the financial data used by the study is characterized by seasonality, temporal effects and non-stationarity. These features make financial data feasible to serial correlation, heteroscedasticity, and non-normality which are the pre-requisites for financial data violating the assumptions of OLS model. It is for this justification that the study resulted on the use of GLS model. GLS model controls for serial correlation, non-constant variance and non-normality and still yields unbiased estimators for the model. Unlike OLS estimators, GLS estimators accounts for the differences in variances of financial risk along periods of time (Andriani & Wiryono, 2015). GLS has been used extensively to model macro-economic and financial data. R studio analytical software was used for GLS modeling.

The study also employed panel data analysis using fixed and random effects model to control for specific bank effects on the influence of financial risk on stock returns. This guarantees that the overall study is not privy to omitted variable bias due to individual bank effects (Wooldridge, 2002). The study also employed the model to test short term and long term influence of financial risk on stock returns. Muriithi (2016) used the model in her study to test the short term and long term influence of

financial risk on financial performance. On the fixed model, the study tested long run and short run fixed effects to establish whether unobserved individual bank effects are correlated with financial risk. On the random model the study tested long run and short run random effects to establish whether unobserved individual effects are correlated with the disturbance term on the influence of financial risk on stock returns. The study presented short run fixed and random model by lagging the dependent variable of stock returns by lag one. This is to establish whether investors use previous investment returns to determine their present investment decision today. To select the model that provides efficient estimators, the study conducted a Hausman test to select the preferred model between long run fixed or random and between short run fixed models against short run random model. Eviews software package was used for this analysis.

To determine the influence of financial risk on stock returns, the study used GARCH (1, 1) model which is robust to establish how financial risk influence stock returns and at the same time model the unexplained disturbance terms to establish whether stock return generating process is time varying (Predescu & Stancu, 2011). The stock trends described by figure 1.1 depict high volatility at NSE occasioned by the plunging of bank stocks. Significant drop of NSE market and increase in financial risk justify the volatility modeling using GARCH (1, 1). Using GARCH model, the study determined the influence of stock return volatility on stock returns. This involved testing whether volatility or unexplained non-linear error terms are mean reverting to establish whether volatility of stock returns helps in predicting stock returns. Stock return volatility is an endogenous systemic risk factor affecting stock returns. ARCH/GARCH volatility modeling technique was used to estimate conditional variance of stock returns. Bollerslev (1986) generalized ARCH model and proposed variance as a function of lagged squared residuals and its own past values. GARCH (1,1) model was found appropriate for non-constant variance, volatility clustering, negatives variance elimination and parsimony. However, despite these differences in GARCH and ARCH models, both estimate their coefficients using maximum likelihood test.

ARCH (1, 1) model is described as below:

$$\sigma_{i,t}^2 = \alpha_1 + \alpha_1 \epsilon_{i,t-1}^2$$

Where σ_t^2 the conditional variance at time t, ϵ_{t-1}^2 is the past squared residual at time t.

The effect of stock volatility or the ARCH effect is determined by the coefficient of squared residuals α_1 . GARCH is an extension of ARCH proven to be more useful for time series modeling. It is described below:

$$\sigma_{i,t}^2 = w + \sum_{i=1}^q \alpha_1 \epsilon_{i,t-1}^2 + \sum_{i=1}^p \beta_1 \sigma_{i,t-1}^2$$

Where the conditional variance σ_t^2 is influence by the previous squared errors and its past values. α_1 and β_1 are coefficient determinants of σ_t^2 and they describe shock persistence (Ndwiga & Muriu, 2016). Paniat and Slavescu (2012) investigated stock volatility persistence in Romania using GARCH-in-Mean model for seven companies and three market indices based on daily, weekly and monthly frequencies for the period 1997 to 2012. Eviews software package was used to aid descriptive and inferential analysis of GARCH model.

In this study means, median, maximum, minimum, standard deviations, skewness, kurtosis and Jarque Bera were computed and summarized to explain the behavior of variables of interest. The relationship between financial risk and stock returns was hypothesized to be linear at 5% level of significance. T-test was used to establish significance of individual coefficients. In cases where t values are larger than critical values at the specified 5% level of significance, then the null hypothesis that the regression coefficient (financial risk) is not significantly different from zero was rejected. This implies that the influence of financial risk on stock returns.

ANOVA and correlation analysis were used to discover the associations in the datasets (Houser, 2011). R-squared was used to establish the goodness of fit and

ascertain the percentage of variation of stock returns explained by financial risk. F-test was employed to test the overall significance of the model which was to establish the influence of financial risk on stock returns. The study tested the hypothesis to establish whether the independent variable influences the dependent variable. The null and alternative hypotheses were represented as below.

$$H_0: \beta_k = 0$$

$$H_1: \beta_k \neq 0$$

3.9.2 Measurements of Variables

The study adopted credit risk, market risk, liquidity risk, capital risk as independent variables referred to a financial risk. Bank size was taken as the moderating variable and stock returns as independent variable. This section describes how each of the variable was measured.

Credit Risk

In this study credit risk was measured using the ratio of Non-performing loans to gross loans (NPG) and the ratio of loan loss reserve to gross loans (LLG) as summarized in table 3.4. These measures conform to following empirical studies (Der-Fen, 2005; Kolapo et al., 2012; Abu, Sajeda & Mustafa, 2015; Michael, William & Gary, 2001).

Market Risk

In this study, market risk was measured by the rate of change of interest rates and the rate of change of exchange rate on Kenya shilling against US dollar. Interest rate was operationalized as annual rate of change of 91-day Treasury bill. The exchange rate is operationalized as the annual rate of change of exchange rate between Ksh and USD as summarized in table 3.4. This measure of market risk conforms to empirical studies according to Sukcharoensin, (2013) and Stuart (2007). The study also used the rate of change of exchange rate between Ksh and USD as a measure of financial risk (FR_{it}) being the vector exogenous ($mx1$) explanatory variable of Financial risk

under GARCH model. The measure of financial risk under GARCH was calculated monthly from January 2006 to December 2015 due to large data needed for volatility pooling

Liquidity Risk

This study adopted funding liquidity risk measured by the ratio of loans to total bank deposit and the ratio of liquid assets to total assets as summarized in table 3.4. (Diana & Moshe, 2012; Chortareas et al, 2011; El Mehdi, 2014; Saleh, 2014).

Capital Risk

In this study capital risk was operationalized by the ratio of core capital to risk weighted asset and the ratio of shareholders' funds to total assets as summarized in table 3.4. The measure of capital risk is in accordance with the following studies: Demirguc et al. (2010); Jing & Kostas, (2012); Der-Fen, (2005); Sonali & Amadou, (2012); Kolapo et al. (2012).

Bank Size

In this study bank size represents the moderator variable and was measured by bank size and operationalized as the log of bank assets (El Mehdi, 2014; Aga et al., 2013; Laeven et al., 2014)).

Stock Returns

In this study, stock return was measured by the return on bank stocks at time t. Stock return is the change in capital or wealth due to an investment. The changes could occur due to cash flows such as earnings, dividends, or interest or due to negative or positive change in price (Mehri, 2015). To determine stock returns the study employed the following formula applied by Purnamasari et al. (2012) and Predescu and Stancu (2011) in calculating the stock returns:

Equation 3.2: Equation Formula on Determination of Stock Returns

$$R_{i,t} = \ln\left(\frac{P_t + Div}{P_{t-1}}\right)$$

Where, $R_{i,t}$ denote the continuously compounded individual bank stock returns at time t . P_t is the Stock price at the end of the period, P_{t-1} is the stock price at the end of the previous period and Div is the cash dividend during the period. In this study stock returns were computed annually from 2006 to 2015 while stock returns for volatility modeling were calculated monthly from January 2006 to December 2015 due to large data needed for volatility pooling. Logarithmic returns are preferred because they are tractable when handling many sub-periods for a long horizon. They are also statistical and conform to normal distribution (Mouna & Anis, 2015).

Table 3.4: Variable Description and Measurement

Variable(s)	Type	Proxy Variable(s)	Symbol		Questionnaire Reference
			(i,t)	Relationship	
Stock Return (SMV)	D	Stock Return	R		Section I(f), Section VIII
Credit Risk (CR)	ID	Non-Performing loans to Gross Loans	NPG	Positive/Negative	Section II
		Loan loss Provisions to Gross Loans	LLG	Positive/Negative	
Market Risk (MR)	ID	% change on 91 day Treasury Bill Rate	IR	Positive/Negative	Section III
		% change on Ksh to USD Exchange Rate	FX/FR	Positive/Negative	
Liquidity Risk (LR)	ID	Loans to Deposit Ratio	LDR	Positive/Negative	Section IV
		Liquid Assets to Total Assets	LAA	Positive/Negative	
Capital Risk (CAR)	ID	Core Capital to Weighted Assets	CWA	Positive/Negative	Section V
		Equity to Total Assets	ETA	Positive/Negative	
Bank Size (BS)	M	Log of Assets	ZS	Positive	Section VI

3.9.3 Model Specification

Primary Data: Multiple Linear Regression Model (OLS)

Overall Model

$$SMV = \alpha_0 - \beta_1 CR - \beta_2 MR - \beta_3 LR - \beta_4 CAR + \varepsilon \dots\dots\dots 1$$

Where α_0 , β_1 , β_2 , β_3 and β_4 are variable coefficients while ε is the error term. SMV, CR, MR, LR and CAR are explained in table 3.4

To investigate the moderating effect of bank size on the influence of financial risk on stock return of commercial banks listed in the Nairobi Securities Exchange. The study used Baron and Kenny (1986) approach that describes that for any moderation to exist, causal pathways must be known. This implies in estimation of moderating effect, we should first establish bank size as an explanatory variable of stock return.

Explanatory Model

$$SMV = \alpha_0 - \beta_1 FR + \beta_2 BS + \varepsilon \dots\dots\dots 2a$$

Moderation model

$$SMV = \alpha_0 - \beta_1 FR + \beta_2 BS + \beta_3 FR * BS + \varepsilon \dots\dots\dots 2b$$

Where, α_0 , β_1 , β_2 and β_3 are variable coefficients while ε is the error term. FR represents the composite term of financial risk while $FR * BS$ represents the interaction term of financial risk and Bank size to denote the moderation term. SMV and BS are defined in table 3.4. The model equation 2 represents the moderation effect of bank size on the influence of financial risk on stock return.

Secondary Data: GLS Model and Fixed and Random Effects Model.

Overall Model

$$R_{it} = \alpha_0 - \beta_1 NPG_{it} - \beta_1 FX_{it} - \beta_1 LDR_{it} + \beta_1 CWA_{it} + \varepsilon_{it} \dots\dots\dots 3a \text{ GLS model}$$

$$R_{it} = \alpha_0 - \beta_1 NPG_{it} - \beta_1 FX_{it} - \beta_1 LDR_{it} + \beta_1 CWA_{it} + \Theta + \varepsilon_{it} \dots\dots\dots 3b \text{ long run model}$$

$$R_{it} = \alpha_0 + R_{it-1} - \beta_1 NPG_{it} - \beta_1 FX_{it} - \beta_1 LDR_{it} + \beta_1 CWA_{it} + \Theta + \varepsilon_{it} \dots\dots\dots 3c \text{ short run model}$$

Where α_0 , β_1 , β_2 , β_3 and β_4 are the variable coefficients, ε_{it} is the error term while R_{it-1} is the lagged stock returns. R_{it} , NPG, FX, LDR and CWA are explained in table 3.4. Θ represents unobserved individual bank specific effect controlling for endogeneity bias which is assumed to be correlated with variance of the ε_{it} under fixed effects otherwise if uncorrelated the random effects is assumed to be true.

To investigate the moderating effect of bank size on the influence of financial risk on stock return of commercial banks listed in the Nairobi Securities Exchange. The study used Keppel and Zedeck (1989) approach that suggested that the perceived moderator should be determined as an explanatory variable followed by the moderation effect estimation.

Explanatory Model

$$R_{it} = \alpha_0 - \beta_1 FR_{it} + \beta_2 ZS_{it} + \varepsilon_{it} \dots \dots \dots 4a \text{ GLS model}$$

$$R_{it} = \alpha_0 - \beta_1 FR_{it} + \beta_2 ZS_{it} + \Theta + \varepsilon_{it} \dots \dots \dots 4b \text{ long run model}$$

$$R_{it} = \alpha_0 + R_{it-1} - \beta_1 FR_{it} + \beta_2 ZS_{it} + \Theta + \varepsilon_{it} \dots \dots \dots 4c \text{ short run model}$$

Moderation effect Model

$$R_{it} = \alpha_0 - \beta_1 FR_{it} + \beta_2 ZS_{it} + \beta_3 FR * ZS_{it} + \varepsilon_{it} \dots \dots \dots 4d \text{ GLS model}$$

$$R_{it} = \alpha_0 - \beta_1 FR_{it} + \beta_2 ZS_{it} + \beta_3 FR * ZS_{it} + \Theta + \varepsilon_{it} \dots \dots \dots 4e \text{ long run model}$$

$$R_{it} = \alpha_0 + R_{it-1} - \beta_1 FR_{it} + \beta_2 ZS_{it} + \beta_3 FR * ZS_{it} + \Theta + \varepsilon_{it} \dots \dots \dots 4f \text{ short run model}$$

Moderated Overall Model

$$R_{it} = \alpha_0 - \beta_1 NPG * ZS_{it} - \beta_2 FX * ZS_{it} - \beta_3 LDR * ZS_{it} + \beta_4 CWA * ZS_{it} + \varepsilon_{it} \dots \dots 4g \text{ GLS model}$$

Where, α_0 , β_1 , β_2 , β_3 and β_4 are variable coefficient. ε_{it} is the error term. FR represents the composite term of financial risk, FR*ZS represents the interaction term of financial risk and bank size, NPG*ZS represents the interaction term of credit risk and bank size, FX*ZS represents the interaction term of market risk and bank size, LDR*ZS represents the interaction term of liquidity risk and bank size and CWA*ZS represents the interaction term of capital risk and bank size. R_{it} and ZS are defined in table 3.4. Θ represents individual bank unobserved specific effect controlling for endogeneity bias which is assumed to be correlated with variance of the ε_{it} under fixed effects otherwise if uncorrelated the random effects is assumed to be true.

Secondary Data: GARCH Modeling

The study employed GARCH (1, 1) model to investigate the influence of financial risk on stock return of commercial bank listed in NSE being the overall objective of study. GARCH model was employed alongside other models in the study due to its robustness to model non-linear residuals (variance model) alongside determination of influence of financial risk on stock return (mean model). Significant and time varying mean and variance equations indicate stock return volatility is vital for measuring the contagious and systemic effect of financial risk on stock returns. Using GARCH model, the study sought to establish whether past stock return volatility can be used to predict present and future stock returns.

Model Specification

$$R_{i,t} = u + \beta_0 FR_{t-1} + \epsilon_{i,t} \dots \dots \dots \text{Overall model before volatility modeling: equation 5}$$

Where,

$$\epsilon_t^2 = \alpha_1 + \alpha_1 \epsilon_{i,t-1}^2 + \alpha_2 \epsilon_{i,t-2}^2 + \dots + \alpha_q \epsilon_{i,t-q}^2 + v_t \dots \dots \dots \text{Residual model: equation 6}$$

$$\sigma_{i,t}^2 = w + \sum_{i=1}^q \alpha_1 \epsilon_{i,t-1}^2 + \sum_{j=1}^p \beta_1 \sigma_{i,t-1}^2 + \dots \dots \dots \text{Conditional variance: equation 7}$$

Overall model (Mean and Variance equation combined)

$$R_{i,t} = u - \beta_1 FR_{i,t} + \sigma_{i,t}^2 (w + \alpha_1 \epsilon_{i,t-1}^2 + \beta_1 \sigma_{i,t-1}^2) \dots \dots \text{GARCH Model after volatility modeling} \dots \dots \dots 8$$

Where FR_{it} is the $mx1$ vector exogenous explanatory variable of financial risk measured by the rate of change exchange rate between KSH/USD while $\epsilon_{i,t}$ is the unexplained residuals modelled to conditional variance ($\sigma_{i,t}^2$) being $mx1$ endogenous explanatory variable on stock returns. Equation 5 is an overall model before volatility modeling that represent that stock returns is a linear function of financial risk and the

error term. The disturbance term for time series data is characterized as non-linear and therefore requires modeling to establish whether stock returns volatility is mean reverting and stationary. Equation model 6 and 7 indicates GARCH modeling of the error term. The model show that conditional variance $\sigma_{i,t}^2$ is linearly dependent on the past behavior of squared error term $\sum_{i=1}^q \alpha_1 \epsilon_{i,t-1}^2$; the ARCH term, and its past values $\sum_{j=1}^p \beta_1 \sigma_{i,t-1}^2$; the GARCH term. The parameter α_1 indicates the sensitivity of stock returns conditional variance to past values of squared errors while β_1 indicates the sensitivity or measures the variance responsiveness to its own past behavior. The sum of α_1 and β_1 measure the persistence of volatility. As $\alpha_1 + \beta_1$ increase towards one, persistence increases indicating that stock return volatility is time varying, mean reverting and therefore can be used to predict stock returns. Otherwise incase $\alpha_1 + \beta_1 > 1$ the conditional variance of the error term is deemed non-stationary and therefore will not converge at their unconditional values as period increases. Overall GARCH model in equation 8 shows stock returns is a function of financial risk and conditional variance of stock returns.

3.9.4 Data Presentation

Quantitative data was presented using of tables and charts. These methods were used because they are clear, easy to compute, understand and interpret the findings (Saunders, 2007). Tables provided a simple and reliable way of presenting a summarized set of observations. Tables aided the study to present data in the form of absolute numbers or percentages, or both. The use of tables helped the study to display frequency distribution of data, which is a set of categories with numerical counts. Tables aided the study to present summarized data using relative frequency. Relative frequency represents data as a percentage of the total number of observations within an interval. Charts are visual representations of numerical data and if well designed they convey the general patterns of the data. The tables and

charts provide attractive display for easier understanding and communication (Cooper & Schindler, 2014).

3.9.5 Diagnostic Tests

The process of estimating the relationships between variables and hypothesis testing entailed testing the significance of the variable(s) of interest. For test of significance to be administered, model assumptions need to be met. In this study, OLS linear model was used to model the influence of financial risk and stock return based on primary data. The following conditions need to be met for OLS to be administered: normality, homoscedasticity, independence of observations, linearity, goodness of fit and absence of multi-collinearity. GLS model was used for secondary data where assumptions of OLS were violated due limited data and time series nature of financial data. Fixed and random effect model was used to control for omitted variable bias and establish the long run and short effects (Hansen, 2007).

GARCH (1, 1) model was also used to model the influence of financial risk on stock return due to its robustness in modeling volatility. Before GARCH model estimation, properties of time series data were confirmed to be present. These includes: conditions of non-constant variance and non-stationarity, volatility clustering, non-normality, and serial correlation. For purposes of all models estimated, data was subjected to various diagnostics tests and treatments to ensure model assumptions are met before estimation (Saunders et al., 2009). Failure to comply with the said assumption would lead to faulty findings and conclusions. Compliance to model assumptions ensures the model is robust and fit for intended purpose (Houser, 2011).

Normality

Rawlings et al. (2001) asserts that normality is not a condition for modeling but a prerequisite for testing the significance of the relationship and estimation of confidence interval estimates. Normality test ensures that the data conforms to normal distribution characteristics of the population. Jarque Bera was used to test for normality with the aim of obviating the effects of kurtosis and skewness. For purposes of secondary data modeling Jarque Bera test was employed to test normality due to

its asymptotic (it tests goodness of fit for small size samples). This test was also used by Tah (2013).

H_0 : Residuals are normally distributed

H_1 : Residuals are not normally distributed

Linearity

The data was investigated for linearity, outliers and missing values using linear plots. Outliers are data slots that are statistically inconsistent with data sampled (Kriegel et al., 2010). Two criteria, both of which must be met were used to identify whether a data point is an outlier; the standardized residual, and its consistency with its neighbors. The accommodation approach involved modifying the method of analysis or the model, thus reducing the influence of the outlier (Rencher, 2002).

Test of Serial Correlation

It is the relationship between a given variable and itself over various time intervals. It also refers to a situation where the error terms for one time is correlated with the error of the subsequent time in a regression. Asteriou and Hall (2011) indicated that the computed Durbin Watson statistics should be non-zero ranging from 0 to 4 where value 2 indicates absence of serial correlation. The study also stated that values of Durbin Watson closer to 2 will indicate observation is likely to be free of serial correlation. This study estimated serial correlation using Durbin Watson tests.

Heteroskedasticity

This means non-constant error terms which leads to bias in test statistic and confidence interval. Linear multiple regression analysis technique is built on assumption that variance of error terms is constant (Rencher, 2002). Heteroskedasticity was tested by Breusch-Pagan-Godfrey test. The null hypothesis is that the residuals are homoscedastic. Presence of heteroskedasticity was solved by model re-specification and variable transformation.

H_0 : Constant variance

H_1 : Errors increase or decrease with increase in predicted values of Y

Test of ARCH effect

The presence of ARCH conditions is important for volatility modeling to be significant otherwise the model will be mis-specified. An ARCH test for purpose of volatility modeling was based on Lagrangian Multiplier (LM), a test statistic given by: $LM = nR^2$ where n is sample size and R^2 the coefficient of determination which signify goodness of fit for residual model (Waititu et al., 2013). The test first obtained the residuals from conditional mean equation which involved regressing the mean equation to obtain the residuals as par equation below,

$$R_{i,t} = \alpha_0 + \beta_1 R_{i,t-1} + \epsilon_{i,t} \dots \dots \dots \text{mean model (refer equation 5 above)}$$

Once residuals are obtained the squared residuals is regressed on q lags and a constant to obtain the goodness of fit using R^2 as par equation below:

$$\epsilon_{i,t}^2 = \alpha_0 + \alpha_1 \epsilon_{i,t-1}^2 + \alpha_2 \epsilon_{i,t-2}^2 + \dots + \alpha_q \epsilon_{i,t-q}^2 + v_t \dots \dots \dots \text{residual model (refer equation 6 above)}$$

After obtaining the squared residuals the study undertook an ARCH-LM test. If the test statistic is greater than the critical value of the Chi-square distribution, reject the null hypothesis that there are no ARCH effects in the residual series up to order q (Rachev, et al., 2007).

H_0 : No ARCH effects in the residuals

H_1 : Presence of ARCH effects in the residuals

Unit Root Analysis

Unit root analysis involves the test of stationary property on time series data. The study used Philips and Perron (PP) test to handle serial correlation in the error terms of financial time series. PP test is a modification of Augmented Dickey-Fuller (ADF) that considers the less restrictive nature of the error process. Brooks (2002) indicates that if the test statistics are higher than the critical values the variables are non-stationary and that the distribution of PP and ADF test are same and therefore their critical values are equally applicable. The study minimized non-stationary series by adopting continuously compounded stock returns (Sukcharoensin, 2013).

H_0 : Residuals have unit root (residuals are non stationary)

H_1 : Absense of unit root(residuals are stationary)

Omitted Variable Bias

The study used Ramsey reset to test for omitted variable bias on primary data. For secondary data, fixed and random effects model was used to control for potential omitted variable bias. Fixed effects model was deemed appropriate when controlling for unobserved heterogeneity where the heterogeneity is correlated with predictor variables and is constant over time. The model assumed no other omitted factors affects the model. Random effects model is true when unobserved heterogeneity of individual bank specific effects is uncorrelated with the predictor variables. Random effects may be used on assumption that the difference cross groups influence dependent variable. To choose which model carries the most efficient estimators, the study carried out a Hausman specification test with the following null and alternate hypothesis.

H_0 :Regressors and individual heterogeinity are strictly exogeneous

H_1 :Regressors and individual heterogeinity are strictly endogeneous

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter comprised of data analysis, interpretation and discussion where the results were presented in tables and charts. The analyzed data was arranged under themes as reflected on the research objectives.

4.2 Response Rate

The number of questionnaires that were administered was 364 and a total of 306 questionnaires were properly filled and returned. Some of the respondents returned the questionnaires half-filled while others refused to return them completely despite a lot of follow up. The response rate result is shown in Table 4.1.

Table 4.1: Response Rate

Response	Frequency	Percent
Returned	306	84.06%
Unreturned	58	15.04%
Total	364	100%

The response rate was 84.06% as shown on Table 4.1. This represented an overall success according to Mugenda and Mugenda (2003) and Kothari (2004) who established that a response rate of above 50% is adequate for a descriptive study. Cooper and Schindler (2014) also argued that a response rate exceeding 30% of the total sample size provides enough data that can be used to generalize the characteristics of a study problem as expressed by the opinions of few respondents in the target population. Based on these assertions the response rate of 84.06% was adequate for the study and therefore considered good to provide information for analysis and deriving of conclusions.

4.3 Reliability Analysis

The reliability of an instrument refers to its ability to produce consistent and stable measurements. Bryman (2008) explains that reliability can be seen from two sides: reliability (the extent of accuracy) and unreliability (the extent of inaccuracy). The most common reliability coefficient is Cronbach's alpha which estimates internal consistency by determining how all items on a test relate to all other items and to the total test of internal coherence of data. The reliability is expressed as a coefficient between 0 and 1.00. The higher the coefficient, the more reliable is the test.

Table 4.2: Test of Reliability

Variables	No. of items	Reliability	Comments
		Cronbach's alpha	
Credit Risk	5	0.701	Accepted
Market Risk	5	0.710	Accepted
Liquidity Risk	5	0.700	Accepted
Capital Risk	5	0.896	Accepted
Bank size	5	0.859	Accepted
Stock Returns	5	0.871	Accepted

Reliability of this instrument was evaluated through Cronbach Alpha which measures the internal consistency. Cronbach Alpha value is widely used to verify the reliability of the construct. A Cronbach alpha of 0.7 and above indicates the presence of internal consistency and therefore the data is reliable for use in the study. Internal consistency means that the questions or items included for a construct belong to that construct (Babbie & Mouton, 2010). All the variables had an acceptable Cronbach alpha above 0.7 as shown in table 4.2 above.

4.4 Demographic Characteristics

This section consists of information that describes basic characteristics such, age of the respondent, level of education, job position, department, returns and performance

4.4.1 Age of the Respondents

The research sought to determine the age distributions of the management cadre serving in the banking industry. This was to establish the capacity of the financial institution to build institutional memory by incorporating the youth and the aged managers, a criterion suitable for a sustainable risk management culture. A good proportion of the aged in the management of banks indicated reliable stewardship for investor confidence. The percentage of the youth in the management is an indication of excellent governance in talent recognition on reward and remuneration. The age distribution shows that banking industry is an equal opportunity employer contributing to realization of the vision 2030 in building capacity and offering employment for youth (CBK, 2016). The table 4.3 below gives the summary of the respondents' age bracket.

Table 4.3: Age of the Respondents

Age	Frequency	Percent (%)
18-29 years	37	12.1
30-39 years	104	34
40-49 years	86	28.1
50-59 years	67	21.9
60 and over years	12	3.9

Majority of the respondents, 34% were on age bracket of 30-39 years. 28.1% were on age bracket of 40-49 years; 21.9% were on age bracket of 50-59 years; 12.1% were on age bracket of 18-29 years while 3.9% were above 60 years. This implies that majority of the employees in the banking sector were middle aged. According to the Population Situation Analysis Report for Kenya (2014), population growth for

persons aged 24-34 years increased from about 12% in 1999 to nearly 15% in the year 2009. Therefore, the finding of this study reflects the current trend of the Kenya population indices.

4.4.2 Education Level of the Respondents

An educated human resource is a key competency in offering competitive advantage in an organization. Education level supplement's the experience a bank manager holds in undertaking critical managerial decisions which includes optimizing risk return trade off to maximize stock returns. Figure 4.1 below gives the summary of the respondents' education level.

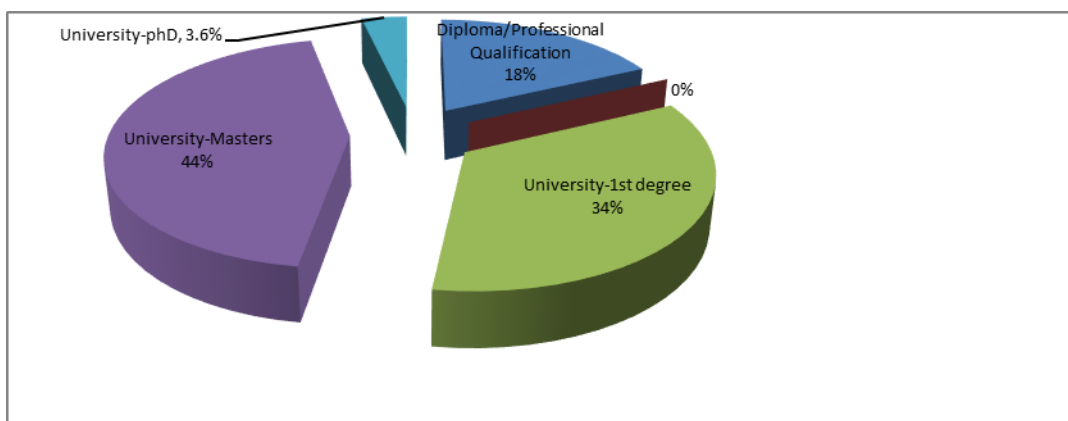


Figure 4.1: Level of Education

Results in Figure 4.1 shows majority of the respondents were master's degree education level at 44%; 38% of the respondents had first degree education level; 18% of the respondents held Diplomas and Professional qualifications while only 3.6% of the respondent had their highest level of education being PhD. This finding implies that the employees in the banks are competent. The findings also imply that the respondents could read the questionnaire on their own which conforms to the informed responses received. This finding is consistent with that of Adegroye, Oladejo and Moruf (2012) who found out that firm performance is positively related to employee's academic qualification.

4.4.3 Position of the Respondents

The study enquired the position of respondents to establish the seniority of the respondents in management of financial institutions. The study considered managers and other senior employee's as custodians of financial risk capable of defining the risk appetite of banks and therefore better placed to understand how factors of financial risk relates to stock returns. The distribution of seniority in the respondents helped the study on how different levels of decision making perceived the influence of financial risk on stock return. Position distribution also helped the study on the effectiveness of delegation process. High level management is appropriate due to experience and capacity to make policy decisions in the organization. However, the middle level management is equally important since they furnish top level with information on the operationalization of financial risks exposed to the banks

Table 4.4: Positions of the Respondents

Position	Frequency	Percent
Director	16	5.2
General Manager	51	16.7
Head of Department	125	40.8
Manager	114	37.3

The results in Table 4.4 show that 40.8% of the respondents were the heads of Departments, 37.3% were the managers, and 16.7% were the general managers while 5.2% were the directors. Further, the respondents were asked to indicate their respective departments to establish how the respondent's line of service is related to financial risk. The departments as indicated by all respondents are well conversant with the determinants of financial risk and stock return.

Table 4.5: Department

Department	Frequency	Percent (%)
Credit department	63	20.6
Operations department	13	4.2
Treasury department	75	24.5
Finance department	53	17.3
Risk department	102	33.3

Table 4.5 above shows that 33.3% of the respondents being the majority were from risk department, 24.5% were from treasury department, 20.6% were from credit department, 17.3% were from finance department while 4.2% of the respondents were from operations department.

4.4.4 Stock Returns and Bank Performance

To confirm the extent of agreement on the research problem with regards to increased volatilities of stock returns in the banking industry. The respondents were asked to indicate if the stock returns of their banks had experienced a decline in the last five years.

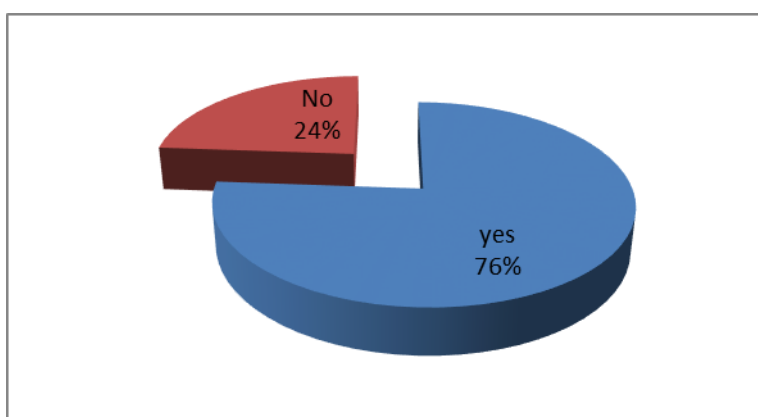


Figure 4.2: Stock Returns

Figure 4.3 above shows that 76% of the respondents indicated that the stock returns of their banks had experienced a decline in the last five years while 24% of the

respondents indicated that the stock returns of their banks have not experienced a decline in the last five years. This finding is consistent with that of Forbes (2016) who found out that the net returns for pension firms from 2012 to 2015 reduced by 6.6%. In 2014/2015 dividends at NSE reduced with 18 listed firms issuing profit warnings compared to 11 and 8 companies in 2014 and 2013 respectively. Further, the respondents were requested to rate the average stock performance of their banks for the last five years.

Table 4.6: Average Stock Performance

Performance	Frequency	Percent (%)
Very low.	79	25.8
Low	134	43.8
Moderate	71	23.2
High	22	7.2
Very high	-	-

Results in Table 4.6 shows that 43.8% of the respondents rated the average stock performance of their banks as low, 25.8% rated the stock performance as very low, 23.2% rated it as moderate, 7.2% of the respondent's rate stock performance of their bank as High while none of the respondent rated average stock performance of their bank as very high. These observations are evidenced by adverse market trends on stock returns at the NSE. The regulation on interest capping is also significant due to its effect on credit risk and profitability of banks. In Kenya depreciation of the Kenya shilling against the US dollar increased from 88 to 105, 91-day Treasury bill increased from 8.29% to 14.61% in 2014/2015, while NPLs increased from 103 to 124.7 billion. In 2015/2016, CBK placed 3 under receivership (CBK, 2016). These justifications form the basis for the dismal performance of the banking stocks in Kenya.

4.5 Descriptive Statistics

Descriptive statistics were performed per objective; influence of credit risk on stock return of commercial banks listed in NSE, influence of market risk on stock returns of commercial banks listed in NSE, influence of liquidity risk on stock return of commercial banks listed in NSE, influence of capital risk on stock return of commercial banks listed in NSE and lastly the moderating effect of bank size on the influence of financial risk on stock return at NSE.

4.5.1 Credit Risk

The first objective of the study was to examine the influence of credit risk on stock returns of commercial banks listed in NSE. Using a five-point likert scale, the study sought to know respondents' level of agreement on various statements relating to influence of credit risk of commercial banks listed in NSE. The responses were presented in Table 4.7 below.

Table 4.7: Credit Risk

Statement	Very low.	Low	Moderate	High	Very high	Mean	Std. Dev
Lack of clear structure and responsibilities of credit risk committees	0.0%	6.2%	26.8%	40.8%	26.2%	3.87	0.87
Increasing level of non-performing loans	4.2%	16.3%	50.7%	18.6%	10.2%	3.13	0.95
Increasing level of loan loss provisions	5.9%	21.3%	19.3%	27.2%	26.3%	3.47	1.25
Lack of policies and procedures on insider lending	0.4%	18.3%	28.4%	36.9%	16.0%	3.50	0.98
High level of non-performing loans is unsecured	2.5%	11.8%	27.5%	30.4%	27.8%	3.69	1.08
Average						3.53	1.03

Results in table 4.7 revealed that 67% (40.8%+26.2%) being majority of the respondents indicated that lack of clear structure and responsibilities of credit risk committees increases credit risk to a high extent. 28.8%(18.6%+10.2%) of the respondents indicated that increasing the level of non-performing loans increases credit risk to a high extent. The results also revealed that 53.5% (27.2%+26.3%) of the respondents indicated that increasing level of loan loss provisions increases credit risk of their bank to a high extent. 52.9.7% (36.9%+16%) disclosed that lack of policies and procedures on insider lending leads to an increase in credit risk to a high extent.

Lastly, the results show that 58.2% (30.4%+27.8%) of the respondents asserted that the increasing level of non-performing loans being unsecured increases credit risk. Using a five-point likert scale, the overall mean of the responses was 3.53 which reveals that majority of the respondents indicated that the stated actions increases credit risk to high extent. Additionally, the standard deviation of 1.03 indicated that the responses were varied.

4.5.2 Market Risk

The second objective of the study was to examine the influence of market risk on stock returns of commercial banks listed in NSE. Using a five-point likert scale, the study sought to know respondents' level of agreement on various statements relating to influence of market risk of commercial banks listed in NSE. The responses were presented in Table 4.8 below.

Table 4.8: Market Risk

	Very low.	Low	Moderate	High	Very high	Mean	Std. Dev
Over 20% of deposit base in many occasions is in foreign currencies	5%	0.7%	32.2%	34.2%	27.9%	3.79	1.02
Over 20% of loans are mostly funded by borrowed funds.	9.8%	11.4%	37.9%	31.7%	9.2%	3.19	1.08
Over 20% consolidated bank profit is from subsidiaries operating outside the country.	3.6%	19.2%	28.5%	32.4%	16.3%	3.39	1.08
The bank lack expertise to hedge the depreciation of KSH against the USD on asset and liability exposures	10.1%	27.1%	34.0%	16.7%	12.1%	2.93	1.09
Failure to conduct Stress test and therefore effects of market risk on the balance sheet are rarely detected.	6.5%	35.3%	25.2%	20.9%	12.1%	2.97	1.15
Average						3.25	1.09

Results in table 4.8 revealed that 62.1% (27.9% + 34.2%) of the respondents indicated that over 20% of deposit base in many occasions is in foreign currencies which increases market risk to a high extent. 40.9% (31.7%+9.2%) of the respondents specified that mostly over 20% of loans are mostly funded by borrowed funds, which increases market risk to a high extent where as 37.9% remained moderate. The results also revealed that 48.7% (32.4%+16.3%) of the respondents indicated that over 20% consolidated bank profit is from subsidiaries operating outside the country which increases market risk of their bank to a high extent while 28.5% remained modest. 28.8% (16.7%+12.1%) of the respondents disclosed that where the bank lack expertise to hedge the depreciation of KSH against the USD on asset and liability exposures, it leads to an increase in market risk to a high extent, where as 34% were

uncertain whether lack of expertise to hedge of price fluctuations on USD against Ksh increased market risk for their bank.

Lastly, the result shows that 33% (20.9%+12.1%) of the respondents indicated that failure to conduct Stress test on the effects of market risk on the balance sheet increases in market risk to a high extent while 41.8% indicated that failure conduct stress tests increases market risk for their banks to low extent. Using a five-point likert scale, the overall mean of the responses was 3.25 which reveals that majority of the respondents were moderate that the stated actions increases market risk for their bank. Additionally, the standard deviation of 1.09 indicated that the responses were varied.

4.5.3 Liquidity Risk

The third objective of the study was to examine the influence of liquidity risk on stock returns of commercial banks listed in NSE. Using a five-point likert scale, the study sought to know respondents' level of agreement on various statements relating to influence of liquidity risk of commercial banks listed in NSE. The responses were presented in Table 4.9 below.

Table 4.9: Liquidity Risk

Statement	Very low.	Low	Moderate	High	Very high	Mean	Std. Dev.
Failure by Asset and Liability Committee to coordinate, plan and communicate on balance sheet liquidity items.	5.2%	22.2%	32.0%	27.1%	13.5%	3.12	1.09
Loans to deposit ratio mostly exceeds 60%	5.2%	19.5%	34.3%	33.3%	7.7%	3.17	0.99
Failure to keep liquid assets to match cash flow requirements	12.1%	24.3%	40.0%	15.1%	8.5%	3.84	1.09
Lack of time frame to review liquidity limits and positions in line with risk tolerance.	4.6%	5.6%	18.6%	44.1%	27.1%	3.88	1.03
The proportion of liquid assets to total deposits decrease mostly to less than 20%	9.5%	19.9%	29.1%	27.8%	13.7%	3.16	1.18
Average						3.43	1.08

Results in table 4.9 revealed that 40.6%(27.1%+ 13.5%) of the respondents indicated that failure by Asset and Liability Committee to coordinate, plan and communicate on balance sheet liquidity items leads to an increase in liquidity risk to a high extent. 41% (33.7%+7.3%) of the respondents specified that Loans to deposit ratio mostly exceeds 60%, increasing liquidity risk to a high extent. The results also revealed that 23.6% (15.1%+8.5%) of the respondents indicated that failure to keep liquid assets to match with cash flow requirements increases liquidity risk of their bank to a high extent. 71.2% (44.1%+27.1%) of the respondents disclosed that failure to review liquidity limits and positions in line with risk tolerance increases in liquidity risk to a high extent.

Lastly, 41.5% (27.8%+13.7%) of the respondents indicated that when the proportion of liquid assets to total deposits decrease mostly to less than 20%, This leads to an increase in liquidity risk to a high extent. Using a five-point likert scale, the overall mean of the responses was 3.43 which reveals that majority of the respondents indicated that the stated actions increases liquidity risk to high extent. The standard deviation of 1.08 indicated that the responses were varied.

4.5.4 Capital Risk

The fourth objective of the study was to examine the influence of capital risk on stock returns of commercial banks listed in NSE. Using a five-point likert scale, the study sought to know respondents' level of agreement on various statements relating to influence of capital risk of commercial banks listed in NSE. The responses were presented in Table 4.10 below.

Table 4.10: Capital Risk

Statement	Very low.	Low	Moderate	High	Very high	Mean	Std. Dev.
Failure to match capital adequacy with bank risk appetite.	41.2%	28.8%	24.8%	4.6%	0.60%	1.95	0.95
Decreasing ratio of shareholders' funds to total assets	45.1%	33.0%	19.0%	1.60%	1.3%	1.81	0.889
Decreasing ratio of core capital to weighted assets	49.7%	27.1%	19.6%	3.3%	0.3%	1.77	0.897
Non-compliance to CBK prudential guidelines on capital adequacy	40.8%	35.6%	20.3%	2.3%	1.0%	1.87	0.881
Failure to provide for risk capital to cater for unforeseen probable losses.	36.9%	28.1%	31.4%	2.3%	1.3%	2.03	0.946
Average						1.87	0.913

Results in table 4.10 show that 70.0% (41.2%+ 28.8%) of the respondents indicated that failure to match capital adequacy with bank risk appetite lead to an increase in capital risk to a very low extent.78.1% (45.1%+33.0%) of the respondents specified that the decreasing ratio of shareholders' funds to total assets, increases capital risk to a low extent. The results also revealed that 76.8% (49.7%+27.1%)of the respondents indicated that decreasing ratio of core capital to weighted assets, increases capital risk of their bank to a low extent. 76.4% (40.8%+35.6%)of the respondents disclosed that Non-compliance to CBK prudential guidelines on capital adequacy leads to an increase in capital risk to a low extent.

Lastly, 65.0% (36.9%+28.1%) of the respondents indicated that failure to provide for risk capital to cater for unforeseen probable losses leads to an increase in capital risk to a lower extent. Using a five-point likert scale, the overall mean of the responses was 1.87 which reveals that majority of the respondents indicated that the stated actions increases capital risk to low extent. Additionally, the standard deviation of 0.913 indicated that the responses were varied.

4.5.5 Bank Size

The fifth objective of the study was to examine the moderating effect of bank size on the influence of financial risk on stock returns of commercial banks listed in NSE. Using a five-point likert scale, the study sought to know respondents' level of agreement on various statements relating to the influence bank size of a commercial bank listed in NSE. The responses were presented in Table 4.11 below.

Table 4.11: Bank Size

Indicators	Very		Moderate	Low	Very		Std. Dev
	high	High			low	Mean	
Asset base	38.2%	35.6%	26.2%	0.0%	0.0%	1.88	0.795
Capital size market	24.8%	34.3%	40.9%	0.0%	0.0%	2.16	0.796
capitalization	36.6%	44.8%	18.6%	0.0%	0.0%	1.82	0.722
Revenue size	34.0%	38.9%	27.1%	0.0%	0.0%	1.93	0.780
Customer base	32.0%	39.9%	28.1%	0.0%	0.0%	1.96	0.776
Average						1.95	0.774

Results in table 4.11 revealed 73.8% (38.2%+ 35.6%) of the respondents indicated that asset base determine the magnitude of bank size to a high extent. 59.1% (24.8%+34.3%) of the respondents specified that capital size determine the magnitude of bank size to a high extent. The results also revealed that 81.4% (36.6%+44.8%) of the respondents indicated that market capitalization determine the magnitude of bank size to a high extent. 72.9% (34.0%+38.9%) of the respondents disclosed that revenue size determines the magnitude of bank size to a high extent.

Lastly, 71.9 % (32.0% + 39.9%) of the respondents indicated that customer base determines the magnitude of bank size to a high extent. Using a five-point scale likert mean, the overall mean of the responses was 1.95 which reveals that majority of the respondents indicated that the stated bank size indicators determine the magnitude of

bank size of listed commercial banks to high extent. Additionally, the standard deviation indicated that the responses were varied with a 0.774 variation.

4.5.6 Stock Returns

The study assessed the stock returns of commercial banks listed in NSE. Using a five-point likert scale, the study sought to know respondents' level of agreement on various statements relating to stock returns of commercial banks listed in NSE. The responses were presented in Table 4.12 below.

Table 4.12: Stock Returns

Statement	Very		Moderate	Low	Very		Std. Dev
	high	High			low	Mean	
Earnings per share	41.5%	34.3%	24.2%	0.0%	0.0%	1.83	0.793
Dividend per share	28.8%	36.3%	35.0%	0.0%	0.0%	2.06	0.797
Capital gains	36.6%	41.2%	22.2%	0.0%	0.0%	1.86	0.755
Economic growth rate	35.6%	38.2%	26.1%	0.0%	0.0%	1.91	0.781
Retained Earnings and Reserves	35.2%	35.3%	29.7%	0.0%	0.0%	1.95	0.804
Average						1.92	0.786

Results in table 4.12 revealed that 75.8.1% (41.5%+ 34.3%) of the respondents indicated that increase in earnings per share increases stock returns to a high extent. 65.1% (28.8%+36.3%) of the respondents specified that an increase in dividend per share increases stock returns to a high extent. The results also revealed that 77.8% (36.6%+41.2%) of the respondent indicated that capital gains increase stock returns to a high extent. 73.8% (35.6%+38.2%) of the respondent disclosed that increase in economic growth rate increases stock returns to a high extent.

Lastly, 70.5% (35.2%+35.3%) of the respondents indicated that retained earnings and reserves increases stock returns to a high extent. Using a five-point likert scale, the overall mean of the responses was 1.92 which reveals that majority of the respondents indicated increase in the stated indicators increase stock returns to a high extent. Additionally, the standard deviation of 0.786 indicates that the responses were varied.

4.6 OLS Model Diagnostics Tests

The study employed OLS model to analyze primary data on the influence of financial risk on stock returns. However, OLS model as a method of estimation requires several assumptions to be met to obtain efficient estimators. Below is estimation of model assumptions.

4.6.1 Linearity and Outliers

OLS demands that the relationship between the predictor and the response variable must be linear. Violation of this assumption implies that the model will impose a linear trend on a data relationship that is not linear. To identify non-linearity the study used excel linear plots as shown in figure 4.3. The relationship between dependent variable of stock returns is generally linear with variables of financial risk depicting negative relationship against stock returns. However, banks size depicts a positive relationship. From the linear plot, the study established few isolated outliers.

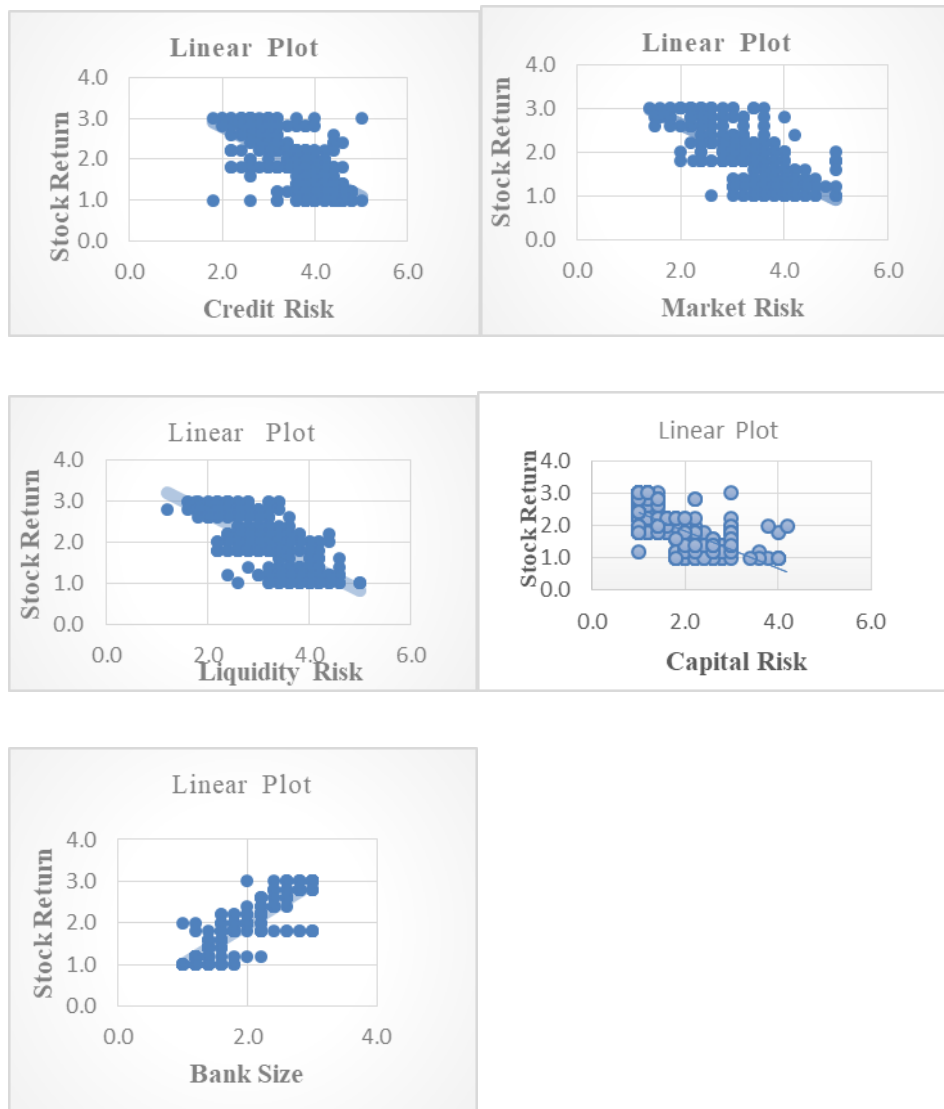


Figure 4.3: Linear Plots

To eliminate few outliers established, the study used studentised residuals to identify the data points that exceeded +2 or -2. The study then winsorised the data above or below 98th percentile for each applicable data set. This approach was successfully in the study of Frank and Goyal (2007).

4.6.2 Multi-collinearity and Correlation Analysis

Correlation analysis shows the relationship that exists between the variables. The study conducted correlation analysis to establish the association between independent variables and stock returns. The results are presented in table 4.13.

Table 4.13: Correlation Matrix

		Credit Risk	Market Risk	Liquidity Risk	Capital Risk	Bank Size	Stock Return
Credit Risk	Correlation	1.00					
	Sig. (2-tailed)	.					
Market Risk	Correlation	0.520**	1.00				
	Sig. (2-tailed)	.000	.				
Liquidity Risk	Correlation	0.536**	0.792**	1.00			
	Sig. (2-tailed)	.000	.000	.			
Capital Risk	Correlation	0.464**	0.513**	0.529**	1.00		
	Sig. (2-tailed)	.000	.000	.000	.		
Bank Size	Correlation	-.623**	-0.668**	-0.703**	-0.583**	1.00	
	Sig. (2-tailed)	.000	.000	.000	.000	.	
Stock Return	Correlation	-.627**	-0.682**	-0.712**	-0.649**	0.887**	1.00
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.
**	Correlation is significant at the 0.01 level (2-tailed).						

Results in table 4.13 showed that credit risk and stock returns are negatively and significantly related ($r=-.627$, $p=0.000$). Market risk and stock return are negatively and significantly associated ($r=-0.682$, $p=0.000$). Liquidity risk and stock return are negatively and significantly associated ($r=-0.712$, $p=0.000$). Capital risk and stock return are negatively and significantly associated ($r=-0.649$, $p=0.000$). Further, results in table 4.13 showed that Bank size and stock return are positively and significantly associated ($r=0.887$, $p=0.000$). The results indicate there is no multicollinearity amongst the variables.

4.6.3 Homoscedasticity

OLS method assumes that for model to hold efficient estimators, residuals must have constant variance. To establish non-constant variance the study conducted Breusch-Pagan-Godfrey test of heteroskedasticity with results on the overall model shown on table 4.14. The test null hypothesis of constant variance was confirmed true with a p-value of 0.2701 hence the model is appropriate.

Table 4.14: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.2936	Prob. F	0.2725
Obs*R-squared	5.1716	Prob. Chi-Square	0.2701
Scaled explained SS	6.4449	Prob. Chi-Square	0.1683

4.6.4 Omitted Variable Bias

The assumptions of OLS model spell out that the error term is independent of the other predictor variables in the model with mean zero and constant variance. If the error term is depended with other variables therefore our model is inconsistent with omitted variable bias. The study used Ramsey reset test of omitted variable bias in OLS primary model but employed fixed and random model to correct for endogeneity bias in subsequent panel data analysis. Table 4.15 shows study results for on Ramsey reset test which tested for null hypothesis that the overall model was void of omitted variable bias. The output results are as shown below,

Table 4.15: Ramsey RESET Test

	Value	Df	P-value
t-statistic	1.0584	300	0.2907
F-statistic	1.1203	(1, 300)	0.2907
Likelihood ratio	1.1405	1	0.2855

The test results show a p-value of 0.2907 which indicate that that the model is consistent and does not require more variables thus there was no omitted variable bias.

4.6.5 Normality

OLS regression model requires that the error terms of the model are normally distributed. However, violation of normality assumption does not contribute to model inconsistency but it helps in estimation of significant p-values necessary for

hypothesis testing. The study estimated normality assumptions of the residuals using Jarque Bera test with null hypothesis being residuals are normally distributed. The results in table 4.16 show that the skewness is revolving around zero. Skewness more than -1 and less than +1 is considered appropriate. The results indicate kurtosis of all the variables revolve around 3 apart from bank size and stock return which indicate moderate kurtosis of 1.8. These boundaries of sktest are described by D'Agostino, Belanger, and D'Agostino (1990). The study established normal distribution on the residuals.

Table 4.16: Normality, Skewness, and Kurtosis.

Parameter	Credit Risk	Market Risk	Liquidity Risk	Capital Risk	Bank Size	Stock return
Skewness	-0.305	0.031	-0.140	0.654	0.165	0.188
Kurtosis	2.300	2.691	2.612	2.677	1.835	1.884
JB	10.996	1.262	2.922	23.139	18.690	17.690
Prob	0.004	0.532	0.232	0.000	0.000	0.000
Obs	306	306	306	306	306	306

The results in table 4.16 on Jarque-Bera test indicates some evidence of non-normality; the most noticeable being capital risk, bank size and stock return. Nonetheless, Brook (2014) indicated the with large samples of more than 200, evidence of non-normality is inconsequential since the central limit theorem enable residuals to asymptotically follow appropriate distributions.

4.7 GLS Model Diagnostics Tests

The study employed GLS model to analyze secondary data using annual data for ten years from 2006 to 2015 to analyze the aggregate influence of financial risk on stock returns to back up the findings from primary data. Findings form secondary data are factual and not subject to human bias. The study upheld findings of secondary data on any inconsistency between primary data and secondary data findings. However,

financial data is subject to non-constant variance, correlated errors and spatial or temporal patterns which lead to possible non-normality and non-stationarity. These conditions violate assumptions of OLS justifying use of GLS model to obtain more efficient estimators. GLS regression extends OLS estimation of the normal linear model by providing for possibly unequal error variances and correlations between different errors (Hansen, 2007).

4.7.1 Descriptive Statistics

Table 4.17 provides the summary of descriptive statistics of the sample showing mean, standard deviation, skewness, kurtosis of the study variables. The results show that a 10 years' investment in the banking stocks based on average listed bank performance obtained an average stock return of 6.3% with a deviation of 35.2%. This is evidence that banking stock has been highly volatile. The banking industry average credit risk measured by ratio of non-performing loans to gross loans (npg) averaged 6.4% slightly below 7% being the industry threshold of maximum allowable credit risk with a deviation of 3.1%. Credit risk measured by ratio of loan loss provisions on gross loans (llg) averaged 5.4% with deviation of 4.2%. This indicated a relatively high credit risk for the listed banks in Kenya. Market risk based on the rate of change of exchange rate (fx) and interest rate (ir) during the ten-year period averaged 3% and 5.6% with deviation of 9.3% and 8.4% respectively.

Market risk returned the highest deviation compared to other independent variables indicating the impact of systemic risk on overall bank financial risk was high. On liquidity risk, banks held the mean ratio of loans to deposit (ldr) at 74% with a deviation of 4.4% while the liquid asset to total asset (laa) averaged 40.5% with a deviation of 3.4%. The liquidity risk ratio on loan to deposit is higher than the industry benchmark of 60%. This shows higher appetite for lending indicating the fragility of banking industry on credit risk and liquidity risk. However, the ratio of liquid asset at 40.5% indicates a favorable balance for funding liquidity. Capital risk measured by the ratio of core capital to risk weighted assets (cwa) was held at an average 14.8% which is remarkably higher than 8% regulatory bench mark while the ratio shareholder funds to total asset (eta) averaged 14.5%. The deviation of capital

ratios for the period were both held at 1% respectively confirming solid capital base held by listed banks. Bank size average 14.382 billion measured in log of asset size (zs) with a deviation of 0.536 billion indicating that over the ten years listed banks have grown exponentially in deposit base. This is good reason to ascertain the impact of emerging financial risk on stock returns for listed banks which are clustered as large banks by banking survey (2015).

Table 4.17: Descriptive Statistics

Descriptive	Rt	NPG	LLG	FR	IR	LDR	LAA	CWA	ETA	ZS
Mean	0.063	0.064	0.054	0.030	0.056	0.740	0.405	0.148	0.145	14.382
Median	0.157	0.060	0.038	0.025	0.078	0.744	0.421	0.149	0.144	14.451
Max	0.493	0.141	0.167	0.207	2.083	0.833	0.440	0.162	0.160	15.106
Min	-0.596	0.037	0.029	-0.093	-1.096	0.687	0.336	0.131	0.128	13.481
Std. Dev.	0.352	0.031	0.042	0.093	0.838	0.044	0.034	0.010	0.010	0.536
Skewness	-0.615	1.630	2.185	0.421	1.230	0.716	-0.952	-0.378	-0.060	-0.284
Kurtosis	2.223	5.070	6.510	2.466	4.802	3.000	2.566	2.113	1.842	1.937
JB	0.881	6.213	13.087	0.414	3.873	0.854	1.587	0.566	0.565	0.605
Prob.	0.644	0.045	0.001	0.813	0.144	0.652	0.452	0.753	0.754	0.739
Observations	10	10	10	10	10	10	10	10	10	10

4.7.2 Normality Test

Table 4.17 shows normality test results conducted using Jarque Bera test. The test obtained a p-value of above 5% level of significance for all variables apart from credit risk measured by ratio of non-performing loans to gross loans (npg) and market risk measured by the rate of change of interest rates. The violation of normality by some variables was expected. This omission was addressed by the used of GLS method of regression.

4.7.3 Stationarity Test

To test for stationarity, the study used Phillip's Perron test statistic. Results in table 4.18 shows stationarity test for all the variables of study. The decision criteria for stationarity were based at the point where the t-statistic was higher than the critical values at 1%, 5% and 10% levels of significance in absolute values. The results in table 4.18 indicate stock return, components of credit and market risk were found

stationary. However, bank size, components of liquidity risk and capital risk found non-stationary at intercept level. This observation was expected by the study and forms the basis for the use of generalized least square model.

Table 4.18: Stationary PP Test

Variable	Level	Exogeneous	PP t-Statistic	Critical Values 1%, 5% 10%	P-Value
Stock Returns (Rt)	Level	intercept	-5.1844	-4.42, -3.25, -2.7	0.004
Ratio of Non-performing loans (npg)	Level	intercept	-4.8075	-4.42, -3.25, -2.7	0.006
Ratio of loan loss provisions (llg)	Level	intercept	-14.5306	-4.42, -3.25, -2.7	0.000
Rate of change of interest rates (ir)	Level	intercept	-12.6164	-4.42, -3.25, -2.7	0.000
Rate of change of foreign exchange (fx)	Level	intercept	-5.7753	-4.42, -3.25, -2.7	0.002
Ratio of loans to deposits (ldr)	Level	intercept	0.4994	-2.84, -1.99, -1.6	0.802
Ratio of liquid assets to total assets(laa)	Level	Intercept	-0.3169	-2.84, -1.99, -1.6	0.542
Ratio of core capital to risk weighted assets (cwa)	Level	Intercept	-0.2088	-2.84, -1.99, -1.6	0.583
Ratio of shareholders' funds to total assets (eta)	Level	Intercept	-1.7523	-2.84, -1.99, -1.6	0.969
Bank Size (zs)	Level	intercept	-2.8385	-4.42, -3.25, -2.7	0.095

4.7.4 Multi Collinearity Test

Pearson correlation test was done to confirm the degree of multi-collinearity amongst the variables. The correlation of financial risk on stock returns was classified in dimension of credit risk, market risk, liquidity risk, capital risk and bank size as shown in Table 4.19.

The results on table 4.19 indicate credit risk ratios are lowly positively related to stock returns. The ratio of non-performing loans to gross loan held a correlation coefficient of 0.09 while the ratio of loan loss provision to gross loans held a correlation coefficient of 0.185. Market risk parameters defined by the rate of change

of foreign exchange on Ksh against USD and rate of change of 91-day treasury bill indicated a negative correlation with coefficients of -.498 and -.746 respectively. Correlation results of liquidity risk and stock returns indicates that the ratio of loans to deposit is negatively correlated to stock returns while the ratio liquid asset to total asset is positively correlated with correlation coefficients of -.224 and .657 respectively. Capital risk ratios of core capital to weighted assets and shareholders' funds to total assets are positively correlated to stock returns with correlations coefficients of .081 and .107 indicating that stock bank stock returns increase as banks enhance their capital base. The results show banks with huge asset are riskier with a negative correlation of asset base to stock returns. The correlation coefficient is lowly negative at -.09. The highest positive correlation is .657 while the highest negative correlation was -.746 implying absence of multi-collinearity among selected variables.

Table 4.19: Variables Correlations Matrix

Parameter	Rt	Npg	llg	ir	fx	ldr	laa	cwa	eta	zs
Rt	1									
npg	.099	1								
llg	.185	.957**	1							
ir	-.746*	-.084	-.030	1						
fx	-.498	-.353	-.452	.167	1					
ldr	-.224	.050	-.041	.268	.171	1				
laa	.657*	-.036	-.010	-.579	-.442	.185	1			
cwa	.081	-.365	-.266	-.083	.024	-.021	.454	1		
eta	.107	-.731*	-.759*	-.049	.193	.426	.362	.243	1	
zs	-.090	-.717*	-.793**	-.002	.423	.535	.343	.233	.887**	1
	10	10	10	10	10	10	10	10	10	10

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

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

4.7.5 Homoscedasticity and Serial Correlation Test

GLS model assumes violation of OLS model for serial correlation and non-constant variance. To establish non-constant variance the study conducted Breusch-Pagan-Godfrey test of heteroskedasticity with results on the overall model shown on table 4.20. The test null hypothesis of constant variance was confirmed true with a p-value of 0.7128 hence the model is appropriate.

Table 4.20: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.5433	Prob. F	0.7128
Obs*R-squared	3.0297	Prob. Chi-Square	0.5529
Scaled explained SS	0.9819	Prob. Chi-Square	0.9125
Durbin Watson (DW)	2.8		

Serial correlation test was done using Ljung box Q-statistic, where all the p-values were established less than 5% level of significance indicating presence of serial correlation. Serial correlation was also done using Durbin Watson test where value 2.8 was established which is greater than two indicating lack of independence of the residuals. The inconsistent characteristics of financial data series were dealt with using GLS model.

4.8 Secondary Data: GARCH (1, 1) Model Diagnostics Tests.

To establish the influence of financial risk on stock returns of commercial banks listed in NSE the study used GARCH (1,1) model which helps to model stock return volatility. The model requires huge data and therefore was based on monthly time series data of stock returns and financial risk (rate of exchange rate on Ksh against USD) for ten years from 2006 to 2015. GARCH (1,1) modeling required for confirmation of ARCH effects, stationarity and volatility clustering as a pre-condition for volatility to persist and evolve over time. Before modelling the study undertook the descriptive statistics and diagnostics test necessary for GARCH (1,1) modelling.

4.8.1 Descriptive Results

Table 4.21 below enumerates the summary statistics for monthly data on bank stock returns and financial risk. The mean for the bank stock returns and financial risk was established to be non-different from zero averaging -0.0015% and 0.003% for stock returns (Rt) and financial risk (fr) respectively. This indicated that volatility of stock returns reverts around zero mean. The time series stock returns and financial risk are negatively skewed by -0.8290 and -0.4238 respectively. This is an indication that variables are highly systemic. The descriptive statistic shows excess kurtosis of 4.89 and 6.55 for stock returns and financial risk respectively. This result confirms that the underlying distribution of stock returns and financial risk are heavily leptokurtic. Kenyan banks stocks were found to be volatile with banking sector having stock return deviation of 0.0509 compared to the mean of -0.0015. Financial risk depicted a less volatile environment with a deviation of 0.0238 compared to a mean of 0.003. Jarque-Bera statistic was positive and statistically significant which means we rejected normality at 1% level of significance with a p-value of 0.000. Correlation test indicates there exist negative relationship between financial risk and bank stock returns with a correlation coefficient of -0.29.

Table 4.21: Descriptive Statistics for Stock returns and financial risk

Descriptive	Rt	FR
Mean	-0.002	0.003
Median	0.005	0.003
Maximum	0.128	0.073
Minimum	-0.197	-0.084
Std. Dev.	0.051	0.024
Skewness	-0.829	-0.424
Kurtosis	4.886	6.550
Jarque-Bera	29.171	61.610
Probability	0.000	0.000
Correlation with Rt	1.000	-0.298
Observations	111	111

4.8.2 Volatility Clustering

Clustering volatility is a condition necessary for volatility modeling. It implies that for a time series, the period of low volatility is followed by periods of low volatility for a long time and period of high volatility are followed by period of high volatility for a long period. Figure 4.4 show a plot of residuals for bank stock returns and financial risk. The plot shows from 2006 to mid of 2011 periods of high volatility were followed by periods of high volatility. Similarly, from mid-2011 to 2015 periods of low volatility are followed by another period of low volatility for another long period. This means that in this model clustering volatility exist and therefore fit to run a GARCH model.

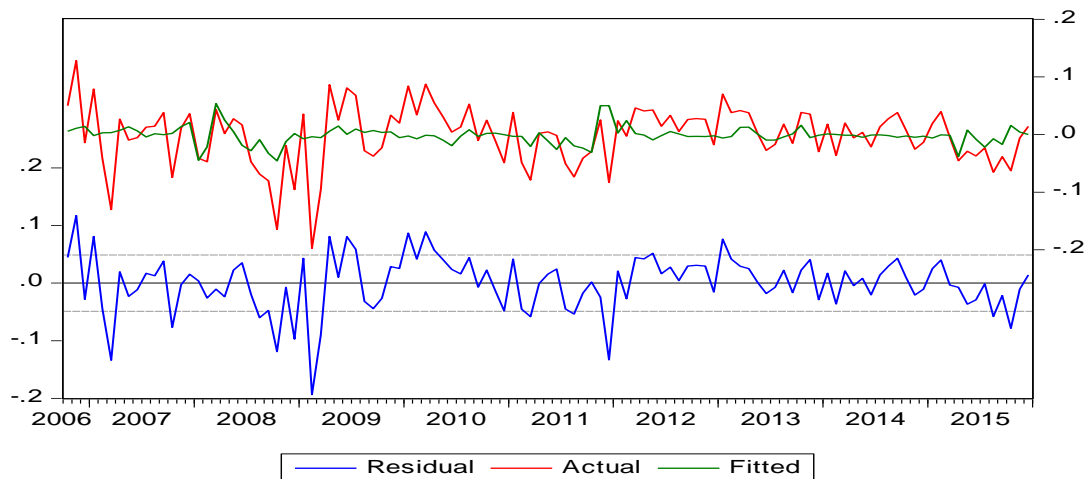


Figure 4.4: Plot of stock returns and financial risk residuals

4.8.3 Stationarity Test for GARCH Modeling

The study tested for stationarity using Phillips Perron test. Table 4.22 indicate the test result which show that changes in monthly returns on Kenya listed banks stock index and financial risk measured by monthly rate of change of USD to Ksh revolved around the mean over time. The result on table 4.21 indicates monthly stock returns and financial risk variable are stationary with higher t-statistics to critical values. Presence of stationarity lays a good ground for analysis of influence of financial risk on stock returns using GARCH model.

Table 4.22: Stationarity test for GARCH (1, 1)

Variable	Level	Exogeneous	PP t-Statistic	Critical Values			P-Value
				1%	5%	10%	
Stock Returns (Rt)	Level	intercept	-8.0886	-3.49	-2.88	-2.58	0.000
Financial Risk	Level	intercept	-7.5835	-3.49	-2.88	-2.58	0.000

4.8.4 Serial Correlation

Asteriou and Hall (2011) indicated that the computed Durbin Watson statistics should range from 0 to 4 where value of 2 shall indicate absence of serial correlation. The study also stated that values of Durbin Watson closer to 2 will indicate observation is likely to be free of serial correlation. The GARCH estimation model depicted Durbin Watson value of 1.56 which indicates adequate measure to conclude absence of serial correlation in the model.

4.8.5 ARCH Effects Test

Before estimating the influence of financial risk and the stock volatility (residual term) on bank stock returns, the study tested the presence of ARCH effects which is as a pre-requisite condition for GARCH volatility modeling. The null hypothesis signifies there is no Arch effect for the model while alternative hypothesis implies that there exist Arch effects. According to the results on table 4.23, an ARCH effects test of lag 1 established presence of arch disturbance with a p-value of 0.0234. The presence of Arch effects in the residuals indicates robustness of the GARCH model in estimating the influence of conditional variance on stock returns.

Table 4.23: Heteroskedasticity Test: ARCH Effects

F-statistic	2.218358	Prob. F (10,90)	0.0234
Obs*R-squared	19.97210	Prob. Chi-Square (10)	0.0295

4.9 Regression Analysis and Hypothesis Testing

4.9.1 Influence of Credit Risk on Stock Returns

The first objective of the study was to examine the influence of credit risk on stock returns of commercial banks listed in NSE. The study employed OLS linear model to analyze perceptions of industry players, GLS regression model was used to analyze secondary data on aggregate influence of credit risk on stock returns of listed banks. Fixed and random effects model was used to examine short run effects, long run effects and heterogeneity effects of individual banks upon which credit risk influences stock returns. Analysis of the models and discussions are described below.

OLS model

The study used OLS model to analyze primary data on influence of credit risk on stock returns. The results in table 4.24 presents the model fitness used in the regression. The model indicates $R^2 = 0.3925$ which show that there exists relative explanatory power of credit risk on stock returns. This implies that 39.2% variation in stock returns is explained by the model $SMV = \alpha_0 - \beta_1 CR$. $R = 0.6265$ indicates the model exhibit a strong linear relationship between credit risk and stock returns. Adjusted R^2 is a modified version of R^2 adjusted for irrelevant predictors. The model shows adjusted $R^2 = 0.3905$ which is slightly lower than R^2 . Adjusted R^2 explains the precise explanatory threshold of independent variable on dependent variable. Adjusted R^2 signify that 39.05% of the variation in stock returns is explained by the credit risk. This means there is a relative influence of credit risk on stock returns of listed banks at NSE. These findings are consistent with the study of Kang & Kang (2009) which indicated that credit risk bears a formidable relationship with stock returns.

Table 4.24: Model Fitness

Indicator	Coefficient
R	0.6265
R Square	0.3925
Adjusted R Square	0.3905
Std. Error of the Estimate	0.4982

a. Predictors: (Constant), Credit Risk

Table 4.25 shows the results of ANOVA test which imply that credit risk has a significant effect on stock returns of commercial banks listed in NSE. This is indicated by F statistic of 196.436 and a p-value of 0.000 which is less than 5% level of significance. These results are depicted by the regression model $SMV = \alpha_0 - \beta_1 CR$. Overall the study rejects null hypothesis that;

H₀₁: Credit risk does not influence stock returns of commercial banks listed in NSE.

Table 4.25: ANOVA of Credit Risk and Stock Returns

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	48.761	1.000	48.761	196.436	0.000
Residual	75.461	304.000	0.248		
Total	124.222	305.000			

a. Predictors: (Constant), Credit Risk

b. Dependent Variable: Stock Return

Table 4.26 provides the results on the regression coefficient of credit risk. The results indicate that credit risk is statistically significant to stock returns with a negative beta coefficient of 0.575. Further, the results imply that credit risk is good predictor of stock returns. The finding of beta = -0.627 and p-value =0.000 concluded credit risk has a negative and significant influence on stock returns of commercial banks listed in NSE. This means that a unitary increase in credit risk will lead to a decrease in stock return by 62.7%. The model summary is as illustrated below;

SMV =3.951- 0.627CR

Table 4.26: Regression of Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.951	0.148		26.750	0.000
Credit Risk	-.575	0.041	-0.627	-14.016	0.000

a. Dependent Variable: Stock Return

GLS model

Using GLS model, the study analyzed the ratio of non-performing loans to gross loans (npg) and the ratio of loan loss reserve as independent variable against stock returns (R_{it}). Table 4.27 shows the regression results based on the correlation structure of ARMA (4, 3). The regression results on the influence of credit risk measured by the ratio of non-performing loans on stock returns was found to be positively significance with a p-value of 0.0179 lower than $\alpha = 0.05$. The regression results on the influence of credit risk measured by the ratio of loan loss provisions on stock returns was found to be negatively significance with a p-value of 0.0297 lower than $\alpha = 0.05$. The significant relationship of credit risk on stock returns conforms to risk-return relationship under stable economic environment, according to Modern Portfolio Theory. This finding corresponds to the study of Kang & Kang (2009). However, investors are seen to prefer banks with less loans provisions. The null hypothesis is therefore rejected that;

H₀₁: Credit risk does not influence the stock returns of commercial banks listed in Nairobi Securities Exchange.

Table 4.27: Regressing NPG, LLG on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Ratio of Non-performing loans (npg)	7.5227	2.5351	2.9674	0.0179
Ratio of loan loss provisions (llg)	-7.9318	3.0053	-2.6393	0.0297

Table 4.27 provides regression coefficients result on credit risk. The results indicate that the ratio on non-performing loans to gross loan risk significantly influences stock returns with a positive beta coefficient of 7.5227. The ratio of loan loss reserves influences stock returns with a negative beta coefficient of 7.9318. This means that all factors held constant a unitary increase in ratio of non-performing loans will lead to an increase in stock returns by 7.5227 while a unitary increase in loan loss provisions will lead to a decrease in stock returns by 7.9318. This findings are summarized by the model below;

$$R_{it} = 0 + 7.5227 \text{ NPG} - 7.9318 \text{ LLG}$$

Fixed and Random Effect Model

Table 4.28 shows a comparative regression analysis on fixed and random effects to establish the impact of bank individual effects under which credit risk influences stock returns. Despite the comparative and mixed findings on long run FE and RE the study employs Hausman test to discriminate the models and establish the model with most efficient estimators.

Hausman test reveals a p-value of 0.528 which indicates we accept the null hypothesis that unobserved individual bank effects are uncorrelated with predictor variables of credit risk hence denoting that the long run random effect model is desirable for interpretation. The analysis on long run random effects specification indicates components of credit risk are negatively related to stock returns. The

findings on long run random effects shows R-square of 0.027 which indicated components of credit risk assuming bank individual fixed effects are uncorrelated with the disturbance term jointly determine 2.7% change in stock returns. Long run random effects shows an F statistic of 1.2 with a p-value 0.29 implying that in the long run components of credit risk are jointly insignificant in influencing stock returns.

Table 4.28: Influence of Credit Risk on Stock Returns

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	0.0970 (0.003)	0.0966 (0.422)	0.1145 (0.001)	0.0761 (0.020)
R _{it-1}			-0.1569 (0.1885)	0.7378 (0.000)
Ratio of non-performing loans (npg)	-0.434 (0.520)	-0.461 (0.499)	-0.332 (0.640)	-1.054 (0.129)
Ration of loan loss provisions (llg)	-0.107 (0.850)	-0.073 (0.898)	-0.177 (0.762)	0.372 (0.505)
Observations	90	90	90	90
R-Squared	0.777	0.027	0.783	0.735
Hausman Test		0.528		0.000
F statistic	24.764	1.229	20.194	28.272
P-value	0.000	0.298	0.000	0.000
Durbin-Watson	2.467	2.233	2.051	2.859

Table 4.28 also shows the results on short run specification. Hausman test on short run FE and RE reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with predictor variables of credit risk hence the fixed effect model is desirable for interpretation in the short run.

The results under dynamic short run fixed effects indicate non-performing loans and loan provisions negatively influence stock returns. The findings on short run fixed effects shows R -square of 0.78 which indicates that components of credit risk jointly determine 78% change in stock returns. Joint effect on short run fixed effects show

an F statistic of 20.19 with a p-value of 0.000. This result indicates that considering individual bank effects are fixed, components of credit risk are jointly significant in influencing stock returns in the short run.

Discussion of Findings

The results from OLS model indicated credit risk negatively and significantly influences stock returns of commercial banks listed in NSE. Individual construct tested indicate that for majority of the banks, lack of clear structure and responsibilities of credit risk committees, lack of policies and procedure on insider lending and high level of non-performing loans being unsecured are the main cause of increasing credit risk in their banks (Jansen, 2012).

GLS regression result indicates that credit risk measured by the ratio of non-performing loans to gross loans is positively and significantly influences stock returns. Interest on loans forms the main income for banks in Kenya which informs the need for increased diversified lending to varied sectors of the economy witnessed in the Kenya banking industry. It is this diversified lending that has progressively increased credit risk to Kenyan banks. However, banks have always levied higher risk premiums to risky borrowers contributing to high returns experienced on banking stocks. The results are in line with the study of Alshatti (2015) which found credit risk positively related to stock returns.

GLS regression results on the influence of credit risk measured by the ratio of loan loss provisions to gross loans has negative significant influence on stock returns. Loan provisions form the capital set aside to settle losses arising from non-performing loans. The analysis of the findings indicates that increase in loan provision is a signaling effect that management is anticipating losses on assets. It is this expectation that adversely affect the demand on the banking stocks hence reducing the capital gains. Similarly, increase in loan provisions reduces overall profits due to listed banks in Kenya thus affecting the ratio of dividends due for distribution. The results are in line with the study of Hatfield and Lancaster (2000) who asserted that loan provisions are negatively significant on abnormal stock

returns was before the event date. Mehri (2015) established that risk capital bears a negative correlation to stock returns.

The results on fixed and random effect model testing individual bank effect under which credit risk influences stock returns indicates credit risk is insignificant in influencing stock returns in the long run under random effect model. However, non-performing loans and loan provision are jointly significant on influencing stock returns in the short run under fixed effects. These findings imply that after controlling for endogeneity bias of unobserved individual bank effect on the influence of credit risk on stock returns investors considers credit risk as valuable component in making stock investment decisions in the short run. The findings of three model analysis signify conformity of study with theoretical framework. It also shows and that stakeholder in the banking industry pay attention to both industry and individual bank risk and how it affects stock returns.

The results met the expectation of the study and conform to the basics of MPT Theory that risk is imperative for investors in banking stocks to yield returns. However, investors risk tolerance is not always equal to manager's risk appetite which leads to principal-agent conflict. Managers should learn to balance risk to optimize shareholder returns. Excessive risk eventually decreases returns on investments. Overall indication is that credit risk influences stock returns of commercial banks listed in NSE. This conforms to the study of (Naser et al., 2011; Mehri, 2015; Kang & Kang, 2009). Positive association was related the study of Alshatti (2015) who found credit risk positively related to stock returns. Negative association is related to the study of Naser et al. (2011) which established credit risk is negatively related to stock returns. Investors consider credit as a critical aspect in their investment decisions

4.9.2 Influence of Market Risk on Stock Returns

The second objective of the study was to establish the influence of market risk on stock returns of commercial banks listed in NSE. The study employed OLS linear model to analyze perceptions of industry players, GLS regression model was used to analyzed secondary data on aggregate influence of market risk on stock returns of

listed banks and Fixed and random effects model was used to examine short run effects, long run effects and heterogeneity effects of individual banks upon which market risk influences stock returns. Analysis of the models and discussions are described below.

OLS model

The study used OLS model to analyze primary data on the influence of market risk on stock returns. The results in table 4.29 presents model fitness used in the regression. The model indicates $R^2=0.465$. This shows that there exists relative explanatory power of market risk on stock returns. This implies that 46.5% variation in stock returns is explained by the model $SMV = \alpha_0 - \beta_1 MR$. $R = 0.682$ indicates the model exhibit a strong linear relationship between market risk and stock returns. Adjusted R^2 is a modified version of R^2 adjusted to eliminate impact of irrelevant predictors. The model shows adjusted $R^2 = 0.463$ is slightly lower than un adjusted R^2 ; indicating a precise explanatory power of independent variable on dependent variable. Adjusted R^2 signify that 46.3% of the variation in stock returns is explained by the market risk. This means there is a relative influence of market risk on stock returns of listed banks in NSE in Kenya. These findings are consistent with the study of Hyde (2007) which indicated that market risk influences stock returns.

Table 4.29: Model Fitness

Indicator	Coefficient
R	0.682
R Square	0.465
Adjusted R Square	0.463
Std. Error of the Estimate	0.468

a. Predictors: (Constant), Market Risk

Table 4.30 shows the results of ANOVA test which signify that overall market risk has a significant effect on stock returns of commercial banks listed in NSE. This is indicated by F statistic of 264.104 and a p-value of 0.000 which is less than 5% level of significance. These results are depicted by the regression model $SMV = \alpha_0 - \beta_1 MR$. Overall the study rejects null hypothesis that;

H₀₂: Market risk does not influence stock returns of commercial banks listed in NSE.

Table 4.30: ANOVA of Market Risk and Stock Returns

	Sum of Squares	df	Mean Square	F	Sig.
Regression	57.749	1.000	57.749	264.104	0.000
Residual	66.473	304.000	0.219		
Total	124.222	305.000			

a. Predictors: (Constant), Market Risk

b. Dependent Variable: Stock Return

Table 4.31 provides the results on the regression coefficient of market risk. The results indicate that market risk significantly influences stock returns with a negative beta coefficient of 0.682. Further, the results imply that market risk is a good predictor of stock returns. The result also indicate market risk has a negative and significant influence on stock returns of commercial banks listed in NSE ($B = -0.682$, $p = 0.000$). This means that a unitary increase in market risk leads to a decrease in stock return by 68.2%. The model summarizes these findings below;

$$SMV = 3.787 - 0.580MR$$

Table 4.31: Regression of Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.787	0.118		32.103	0.000
Market Risk	-.580	0.035	-0.682	-16.251	0.000

a. Dependent Variable: Stock return

GLS model

The study regressed the rate of change of exchanges rate on KES against US (fx) and the rate of change of interest rates on 91-day treasury bills as independent variables against stock returns (R_{it}). Table 4.32 shows GLS regression results based on the correlation structure of ARMA (1, 1). The regression results on the influence of market risk measured by rate of change of interest rate on stock returns was found to be negatively significant with a p-value of 0.0219 which is lower than 5% level of significance. The regression results on the influence of market risk measured by rate of change of exchange rate on stock returns was found to be negatively insignificant with a p-value of 0.1265 which is higher than 5% level of significance. The finding on interest rate risk is in accordance to the theory of Modern Portfolio Theory, the studies of Syed and Anwar (2012) and Hooy et al. (2004). They indicated that excessive risk is negatively related to stock returns. The null hypothesis is therefore rejected that;

H₀₂: Market risk does not influence the stock returns of commercial banks listed in Nairobi Securities Exchange.

Table 4.32: Regressing FX, IR on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Intercept	0.127	0.039	3.260	0.014
Rate of change of interest rates (ir)	-0.285	0.097	-2.933	0.022
Rate of change of exchange rate (fx)	-1.428	0.824	-1.734	0.127

Table 4.32 provides regression coefficients result on market risk. The results indicate that the rate of change of interest rates on 91-day T-bills (ir) influences stock returns (R_{it}) with a negative beta coefficient of 0.2847. The results also indicate that the rate of change of exchanges rate on KES against US (fx) insignificantly influences stock returns (R_{it}) with a negative beta coefficient of 1.4279. This means that all factors held constant a unitary increase in rate of change of interest rates will lead to decrease in stock returns by 0.2847 while a unitary increase in the rate of change of exchange rate will lead to a decrease in stock returns by 1.4279. The constant signifies the risk-free premium; that at zero risk, investors in listed bank will still enjoy stock returns 0.127 times. This is findings are summarized by the model below;

$$R_{it} = 0.127 - 0.2847IR - 1.4279FX$$

Fixed and Random Effect Model

Table 4.33 shows a comparative regression analysis on fixed and random effects to establish the impact of bank individual effects upon which market risk influences stock returns. Despite the comparative and mixed findings on long run FE and RE the study employs Hausman test to discriminate the models and establish the model with most efficient estimators.

Hausman test reveals a p-value of 0.06 which indicates that we accept the null hypothesis that unobserved individual bank effects are uncorrelated with components of market risk denoting that the long run random effect model is desirable for interpretation. The analysis on long run random effects specification indicates interest rates and exchange rate are negatively related to stock returns. The findings show R-square of 0.13 which indicated components of market risk assuming bank individual fixed effects are uncorrelated with the disturbance term jointly determine 13% change in stock returns. Long run random effects shows an F statistic of 6.78 with a p-value 0.000 indicating that components of market risk are individually and jointly significant in influencing stock returns.

Table 4.33: Influence of Market Risk on Stock Returns

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	0.1735 (0.2339)	0.1276 (0.0799)	0.1922 (0.2027)	0.0870 (0.0011)
R _{it-1}			-0.1943 (0.1038)	0.4121 (0.0000)
% change in interest rate (ir)	0.199 (0.3574)	-0.2223 (0.0076)	-0.2453 (0.2755)	-0.1740 (0.0000)
% change in exchange rate (fx)	-3.9915 (0.3905)	-1.6381 (0.0373)	-3.9576 (0.4093)	-0.9100 (0.0019)
Observations	90	90	90	90
R-Squared	0.7747	0.1348	0.7827	0.6064
Hausman Test		0.0555		0.0000
F statistic	24.378	6.776	20.114	39.025
P-value	0.0000	0.0018	0.0000	0.0000
Durbin-Watson	2.1547	2.2238	2.1458	2.1458

Table 4.33 also shows the results on short run specification. Hausman test on short run FE and RE reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with predictor variables of market risk hence the fixed effect model is desirable for interpretation in the short run.

The results also indicate that interest rates and exchange rate are negatively related to stock returns in the short run. The findings on the short run fixed effects model show R-square of 0.78 which indicates that components of market risk jointly determine 78% change in stock returns. Joint effect on short run fixed effects show an F statistic of 20.11 with a p-value of 0.000 indicating that variables of market risk are jointly significant in influencing stock returns.

Discussion of Findings

The results from OLS model indicates market risk negatively and significantly influences stock returns of commercial banks listed in NSE. Individual construct tested indicated that for majority of the banks, the fact that over 20% of deposit base in many occasions is in foreign currency is the main cause of increasing market risk. Respondents asserted that holding over 20% of loan portfolio funded by borrowed funds and having over 20% of profit comes from subsidiaries operating outside Kenya held a slight impact in increasing market risk in banks. Majority of respondents agreed lack of experts to hedge foreign currency exposure and failure to conduct stress test on market risk lowly affects market risk in banks (Sukcharoensin, 2013).

GLS regression results shows market risk measured by rate of change in exchange rates on Kes/Usd is insignificantly negative on stock returns. The results are related to the study of Ryan and Andrew (2004) which held foreign exchange is insignificant in influencing stock returns. However, the direction of influence is related to the study of Mouna and Anis (2015) which established exchange rate positively or negatively related to stock returns depending with the period and hedging capacity of the bank. These findings are also related to the study of Sukcharoensin (2013) which established that in the long run, banks hedge exchange rate exposures and therefore exchange rate does not influence stock returns. An increase in the rate of change of kes/usd indicates that Kenya shilling is losing at the expense of USD. This phenomenon is advantageous to net exporters and disadvantageous to net importers. Kenya imports most of its major commodities such as oils, machinery, and major inputs. Devaluation of the shillings therefore results to a slower economic growth

which adversely affects banks transactional income and the economy appetite for credit. The resultant effect is reduced returns on investments.

GLS regression results indicate that market risk measured by rate of change of interest rates on 91 day-T bills is significantly negative in influencing stock returns. The results are related to the study of Syed and Anwar (2012) which held interest is negatively significant on stock returns. However, the findings are contra to the study findings of Wycliffe and Muriu (2014) who established interest rates are insignificant in determining stock returns alongside macro-economic variables. Short term interest rates on government securities are used by the government to regulate amount of liquidity in the economy. Higher rates attract investment in government securities depriving banks cheap fund to lend. Consequently, investment in government securities deprives the stock market necessary market liquidity to stir the prices of stocks upwards. Analysis of GLS regressions signify that stakeholders in the banking industry pay attention aggregate industry impact of market risk and how it affects bank stock returns.

The results on fixed and random effect model controlling for omitted variable bias under which market risk influences stock returns indicates market risk is negatively significant on stock returns in the long run under random effect model. Similarly, components of market risk are jointly negatively significant on stock returns in the short run under fixed effects. These findings imply that after controlling for endogeneity bias of unobserved individual bank effect on the influence of market risk on stock returns investors considers market risk as valuable component in making stock investment decisions both in the long run and in the short run. The findings also indicate components of market risk are systemic and therefore affects individual banks both in the long run and short run.

The overall results met the expectation of the study and conform to the basics of Modern Portfolio Theory that excessive risk decreases return on investments. The findings also describe APT theory that a series beta risk factors built form macroeconomic influence stock returns. This is an advancement from CAPM that contended only beta risk factor embedded on the asset affects stock returns. These

findings conform to the study of Hyde (2007), Sukcharoensin (2013), Mouna and Anis (2015), Syed& Anwar (2012). Mouna and Anis (2015) established exchange rate positively or negatively related to stock returns depending with the period and hedging capacity of the bank. This is contrary to the studies Ryan and Andrew (2004) that held foreign exchange insignificant to stock returns in the long run. Overall indication is that market risk influences stock returns of commercial banks listed in NSE.

4.9.3 Influence of Liquidity Risk on Stock Returns

The third objective of the study was to analyze the influence of liquidity risk on stock returns of commercial banks listed in NSE. The study employed OLS linear model to analyze perceptions of industry players, GLS regression model was used to analyzed secondary data on aggregate influence of liquidity risk on stock returns on listed banks. Fixed and random effects model was used to examine the short run effects, long run effects and heterogeneity effects of individual banks upon which liquidity risk influences stock returns. Analysis of the models and discussions are described below.

OLS model

The study used OLS model to analyze primary data on the influence of liquidity risk on stock returns. The results presented in table 4.34 presents model fitness used in the regression. The model indicates $R^2 = 0.507$. This shows that there exists a strong explanatory power of liquidity risk on stock returns. This implies that 50.7% variation in stock returns is explained by the model $SMV = \alpha_0 - \beta_1 LR$. $R = 0.712$ indicates the model exhibit a strong linear relationship between liquidity risk and stock returns. Adjusted R^2 is a modified version of R^2 adjusted to eliminate impact of irrelevant predictors. The model shows adjusted $R^2 = 0.505$ is slightly lower than the R^2 indicating a 50.5% precise explanatory power of independent variable on

dependent variable. Adjusted R^2 signify that 50.5% of the variation in stock returns is explained by the liquidity risk. This means there is a strong influence of liquidity risk on stock returns of listed banks in NSE in Kenya. These findings are consistent with the study of Akram (2014) which indicated that liquidity risk relates with stock returns.

Table 4.34: Model Fitness

Indicator	Coefficient
R	0.712
R Square	0.507
Adjusted R Square	0.505
Std. Error of the Estimate	0.449

a. Predictors: (Constant), Liquidity Risk

Table 4.35 shows the results of ANOVA test which signify that overall liquidity risk has a significant influence on stock returns of commercial banks listed in NSE. This is evidenced by the F statistic of 312.328 and a p-value of 0.000 which is less than 5% level of significance. These results are summarized by the regression model $SMV = \alpha_0 - \beta_1 LR$. Overall, the study rejects null hypothesis that;

H₀₃: Liquidity risk does not influence stock returns of commercial banks listed in NSE.

Table 4.35: ANOVA of Liquidity Risk and Stock Returns

	Sum of Squares	df	Mean Square	F	Sig.
Regression	62.950	1.000	62.950	312.328	0.000
Residual	61.272	304.000	0.202		
Total	124.222	305.000			

a. Predictors: (Constant), Liquidity Risk

b. Dependent Variable: Stock Return

Table 4.36 provides the results on the regression coefficients of liquidity risk. The results indicate that liquidity risk negatively and significantly influences stock returns with a negative beta coefficient of 0.712 and a p=000. Further, the results imply that liquidity risk is a good predictor of stock returns. This means that a unitary increase in liquidity risk leads to a decrease in stock return by 71.2%. This is findings are summarized by the model below;

$$SMV = 3.965 - 0.712LR$$

Table 4.36: Regression of Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.965	0.119		33.446	0.000
Liquidity Risk	-.631	0.036	-0.712	-17.673	0.000

a. Dependent Variable: Stock Return

GLS model

The study regressed the ratio of loans to deposit (ldr) and the ratio of liquid assets to total assets (laa) as independent variable against stock returns (R_{it}). Table 4.37 shows GLS regression results with correlation structure of ARMA (1, 1). The regression result on the influence of liquidity risk measured by loans to deposit ratio on stock returns was found to be negatively significant with a p-value of 0.01 which is lower than 5% level of significance. The regression result on the influence of liquidity risk measured by the ratio of liquid assets to total assets on stock returns was found to be positively significant with a p-value of 0.009 which is lower than 5% level of significance. These findings implied that there exists a significant relationship between liquidity risk and stock returns of commercial banks listed in NSE. This conforms to MPT theory that foregoing, liquidity must be compensated with a risk premium. The finding also conforms to Fontaine et al. (2013) that low returns are

associated with illiquidity and high volatility. The null hypothesis is therefore rejected that;

H₀₁: liquidity risk does not influence stock returns of commercial banks listed in NSE.

Table 4.37: Regressing LDR, LAA on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Ratio of loans to deposits (ldr)	-3.908	1.1671	-3.3489	0.010
Ratio of liquid assets to total assets (laa)	7.305	2.1308	3.4283	0.009

Table 4.37 provides regression coefficients result on liquidity risk. The results indicate that the ratio of loans to deposits significantly influences stock returns (R_{it}) with a negative beta coefficient of 3.904. The results also indicate the ratio of liquid assets to total assets significantly influences stock returns (R_{it}) with a positive beta coefficient of 7.305. This means that all factors held constant a unitary increase in loans to deposit ratio will lead to decrease in stock returns by 3.9084 times while a unitary increase in the ratio of liquid assets will lead to an increase in stock returns by 7.305 times. This is findings are summarized by the model below;

$$R_{it} = 0 - 3.9084LDR + 7.305LAA$$

Fixed and Random Effect Model

Table 4.38 shows a comparative regression analysis on fixed and random effects to establish the impact of bank individual effects under which liquidity risk influences stock returns. Despite the comparative and mixed findings on long run FE and RE the study employs Hausman test to discriminate the models and establish the model with most efficient estimators.

Hausman test reveals a p-value of 0.035 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with components of market risk hence at the long run, fixed effect model is desirable for interpretation. The analysis on long run specification indicates loans to deposit ratio is negatively related to stock returns while liquid asset positively related to stock returns. The findings on long run fixed effects show R-square of 0.77 which indicate that components of liquidity risk jointly determine 77% change in stock returns. Analysis of long run fixed effects shows an F statistic of 24.0 with a p-value of 0.000. This finding indicates that components of liquidity risk are jointly significant in influencing stock returns.

Table 4.38: Influence of Liquidity Risk on Stock Returns

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	0.1148 (0.4947)	0.2003 (0.2590)	0.0887 (0.6217)	-0.1110 (0.5052)
R_{it-1}			-0.1979 (0.1017)	0.7171 (0.000)
Loans to deposits ratio (ldr)	-0.0312 (0.8219)	-0.0501 (0.6565)	-0.0742 (0.6080)	-0.0197 (0.8872)
Liquid assets to total assets (laa)	0.1870 (0.5148)	0.1825 (0.5285)	0.1463 (0.6415)	0.3917 (0.1812)
Observations	90	90	90	90
R-Squared	0.7717	0.0055	0.7785	0.5192
Hausman Test		0.0350		0.0000
F statistic	23.964	0.241	19.628	27.358
P-value	0.0000	0.7868	0.0000	0.0000
Durbin-Watson	2.5201	2.2511	2.0911	2.9526

Table 4.38 also shows the results on short run specification. Hausman test on short run FE and RE reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with predictor variables of market risk hence the fixed effect model is desirable for interpretation in the short run.

The results indicate loans to deposit ratio is negatively related to stock returns while liquid asset positively relate to stock returns. The findings on short run fixed effects show R-square of 0.78 which indicates that components of liquidity risk jointly determine 78% change in stock returns. Joint effect on short run fixed effects show an F statistic of 19.6 with a p-value of 0.000 indicating that components of liquidity risk are jointly significant in influencing stock returns in the short run.

Discussion of Findings

The results from OLS model indicates that liquidity risk negatively and significantly influences stock returns of commercial banks listed in NSE. Individual construct tested indicate that for majority of the banks, failure to keep liquid asset to match cash flow requirement and inability to regularly review liquidity limits and positions in line with risk tolerance as the main cause of increasing liquidity risk in their banks. This finding support statutory management of 3 banks by CBK in the year 2015/2016. Respondent asserted that failure by asset and liability committee to plan and disclose on off balance sheet items, loans to deposit ratio exceeding 60% and liquid assets to total asset decreasing below 20% are sources of increasing liquidity risk in banks.

GLS regression results established that liquidity risk measured by ratio of loans to deposits is negatively significant in influencing stock returns. The results conform to the expectation of the study. The results are related to the study of Akram (2014) that held liquidity risk holds a negative relationship with stock returns. Abzari, et al. (2013) determined effects of illiquidity on capital gains. The study held illiquidity characteristic is a crucial factor for capital gains growth and established that illiquidity inhibits a negative relationship with capital gains.

GLS regression results shows that the ratio of liquid assets to total assets is positively significant on stock returns. The results conform to the expectation of the study signifying that adequate liquidity promotes stock returns. The results are related to the study of Fontaine et al. (2013) that held funding liquidity promoted by adequate liquidity levels in banks diffuse positive shocks on stock returns. The study held illiquidity characteristic is a crucial factor for capital gains growth and established that illiquidity inhibits a negative relationship with capital gains. The study confirms that listed banks in Kenya control funding liquidity which drives market liquidity and consequently market liquidity drives stock returns. This relates to the findings according to Dick-Nielson et al. (2013). Analysis of GLS regressions signify that aggregate liquidity risk in the banking industry in Kenya is a predictor of stock returns at NSE.

The results on fixed and random effect model controlling for omitted variable bias upon which liquidity risk influences stock returns indicates liquidity risk is insignificant on stock returns in the long run under random effect model. Similarly, components of liquidity risk are jointly significant against stock returns in the short run under fixed effects. These findings imply that after controlling for endogeneity bias of unobserved individual bank effect on the influence of liquidity risk on stock returns, liquidity risk remains a valuable component in making stock investment decisions in the short run.

The results met the expectation of the study and conformed to the relevance of APT and MPT theory in the study. The significance influence of liquidity risk on stock returns conformed to the study of Aga et al. (2013), Dick-Nielsen, et al. (2013), and Cheng and Nasir (2010). Abzari et al. (2013) and Akram (2014) established liquidity risk have a negative influence on stock returns. Janssen (2012) held a contrary view and held that liquidity risk was positively related to stock returns. Mehri (2015), Purnamasari et al. (2012) and Haque and Wani (2015) established liquidity risk was not significant to stock returns. Overall indication of study from the analysis is that liquidity risk influences stock returns of commercial banks listed in NSE.

4.9.4 Influence of Capital Risk on Stock Returns

The fourth objective of the study was to assess the influence of capital risk on stock returns of commercial banks listed in NSE. The study employed OLS linear model to analyze perceptions of industry players, GLS regression model was used to analyze secondary data on aggregate influence of capital risk on stock returns on listed banks. Fixed and random effects model was used to examine short run effects, long run effects and heterogeneity effects of individual banks upon which capital risk influences stock returns. Analysis of the models and discussions are described below.

OLS model

The study used OLS model to analyze primary data on the influence of capital risk on stock returns. The results in table 4.39 presents the model fitness used in the regression. The model fitness table indicates $R^2 = 0.422$. This shows that there exists a relative explanatory power of capital risk on stock returns. This implies that 42.2% variation in stock returns is explained by the model $SMV = \alpha_0 - \beta_1 CAR$. $R = 0.649$ indicates that the model exhibit a linear relationship between capital risk and stock returns. Adjusted R^2 is a modified version of R^2 adjusted to eliminate impact of irrelevant predictors. The model shows adjusted R^2 of 0.420 which is slightly lower than the R^2 indicating 42% precise explanatory power of independent variable on dependent variable. Adjusted R^2 signify that 42% of the variation in stock returns is explained by the capital risk. This means there exist an influence of capital risk on stock returns of listed banks in NSE in Kenya. These findings are consistent with the study of Mehri (2015) which indicated that capital risk influences stock returns.

Table 4.39: Model Fitness

Indicator	Coefficient
R	0.649
R Square	0.422
Adjusted R Square	0.420
Std. Error of the Estimate	0.486

a. Predictors: (Constant), Capital Risk

The ANOVA test in table 4.40 indicates that capital risk has a significant effect on stock returns of commercial banks listed in NSE. This is depicted by the F statistic of 221.796 and a p-value of 0.000 which is less than 5% level of significance. These results are represented by the regression model $SMV = \alpha_0 - \beta_1 CAR$. Overall, the study rejects null hypothesis that;

H₀₄: Capital risk does not influence stock returns of commercial banks listed in NSE.

Table 4.40: ANOVA of Capital Risk and Stock Returns

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	52.401	1	52.401	221.796	0.000
Residual	71.822	304	0.236		
Total	124.222	305			

a. Predictors: (Constant), Capital Risk

b. Dependent Variable: Stock Returns

Table 4.41 provides the results on the regression coefficients of capital risk. The results indicate that capital risk significantly influences stock returns with a negative beta coefficient of 0.649. Further, the results imply that capital risk is a good predictor of stock returns. The result also indicate capital risk has a negative and significant influence on stock returns of commercial banks listed in NSE (B= -0.649, p=0.000). This means that a unitary increase in capital risk will lead to a decrease in stock return by 64.9%. This is findings are summarized by the model below;

$$SMV = 2.939 - 0.649CAR$$

Table 4.41: Regression of Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.939	0.074		39.783	0.000
Capital Risk	-.540	0.036	-0.649	-14.893	0.000

a). Dependent variable: Stock Return

GLS model

The study regressed the ratio of core capital to risk weighted asset (cwa) and the ratio of shareholders' funds to total asset (eta) as independent variable against stock returns (R_{it}). Table 4.42 show the regression results from GLS based on a correlation structure of ARMA (2, 2). The results on the influence of core capital to risk weighted asset on stock returns was found to be negatively significant with a p-value of 0.0058 which is less than 5% significance level. This finding indicates that an increase in regulated capital reduces ability of the banks to diversify thus contributing to low returns to investors. This conforms to maxims of trade off theory of capital structure and value of the firm.

The results on the influence of shareholder's funds ratio on stock returns was found to be positively significant with a p-value of 0.0001 which is less than 5% significance level. This finding is in accordance expectation of Modigliani and Miller theory on capital relevance that the value of levered firm is higher than the value of unlevered firm. Investors perceive that since shareholder funds is a capital reserve classified as supplementary capital to be utilized by the firm when opportunities arise to boost investor stock return. The regression results indicated that there exists a significant influence of capital risk on stock returns of listed banks at NSE. The null hypothesis is therefore rejected that;

H₀₄: capital risk does not influence the stock returns of commercial banks listed in NSE.

Table 4.42: Regressing CWA, ETA on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Intercept	-0.7246	0.2061	-3.5151	0.0098
Ratio of core capital to risk weighted assets (cwa)	-6.8992	1.762	-3.9154	0.0058
Ratio of shareholders' funds to total assets (eta)	12.5306	0.9627	13.0158	0.0001

Table 4.42 also provides regression coefficients result on capital risk. The results indicate that the ratio of core capital to risk weighted asset significantly influences stock returns (R_{it}) with a negative beta coefficient of 6.8992 while shareholders' funds influences stock returns (R_{it}) with a positive beta coefficient of 12.5306. This means that all factors held constant a unitary increase in core capital ratio will lead to decrease in stock returns by 6.8992 while a unitary increase in shareholder funds will lead to an increase in stock returns by 12.5306. Assuming zero capital risk, stock returns reduces by 0.7246 times. This is findings are summarized by the model below;

$$R_{it} = -0.7246 - 6.8992CWA + 12.5306LAA$$

Fixed and Random Effect Model

Table 4.43 shows a comparative regression analysis on fixed and random effects to establish the impact of bank individual effects under which capital risk influences stock returns. Despite the comparative and mixed findings on long run FE and RE the study employs Hausman test to discriminate the models and establish the model with most efficient estimators.

Hausman test reveals a p-value of 0.9735 which indicates that we accept the null hypothesis that unobserved individual bank effects are uncorrelated with components of capital risk hence at the long run, random effect model is desirable for interpretation. The analysis on long run specification indicates ratio of core capital to risk weighted assets is negatively related to stock returns while shareholder funds

ratio is positively related to stock returns. Results on the long run random effects shows R-square of 0.0364 which indicates that components of capital risk assuming bank individual fixed effects are uncorrelated with the disturbance term jointly determine 3.6 % change in stock returns. Random effects show an F statistic of 1.6 with a p-value 0.199 indicating that components of capital risk are jointly insignificant in influencing stock returns in the long run.

Table 4.43: Influence of Capital Risk on Stock Returns

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	0.0374 (0.7013)	0.0366 (0.8167)	0.0254 (0.8062)	0.0980 (0.3330)
R_{it-1}			-0.1767 (0.1424)	0.7332 (0.0000)
Core capital ratio (cwa)	-0.5368 (0.1594)	-0.5375 (0.1583)	-0.3428 (0.4130)	-0.9479 (0.0220)
Shareholders' funds ratio (eta)	0.7160 (0.2145)	0.7223 (0.2097)	0.7394 (0.2193)	0.4559 (0.4300)
Observations	90	90	90	90
R-Squared	0.7791	0.0364	0.7832	0.5315
Hausman test		0.9735		0.000
F statistic	25.004	1.642	20.166	28.743
P-value	0.000	0.1996	0.0000	0.0000
Durbin Watson	2.2372	2.2534	2.0755	2.7820

Table 4.43 also shows the results on short run FE and RE specification. Hausman test on short run FE and RE reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with predictor variables of capital risk hence the fixed effect model is desirable for interpretation in the short run.

The results indicate ratio of core capital to risk weighted assets is negatively related to stock returns while shareholder funds ratio is positively related to stock returns. The results on short run fixed effects show R-square of 0.78 which indicates that components of capital risk jointly determine 78% change in stock returns. Joint effect on short run fixed effects show an F statistic of 20.2 with a p-value of 0.000. This result indicates that components of capital risk are jointly significant in influencing stock returns in the short run.

Discussion of Findings

The result from linear regression model on primary data indicates that capital risk negatively and significantly influences stock returns of commercial banks listed in NSE. Individual construct tested indicate that for majority of the banks, failure to match capital adequacy with risk appetite, decreasing ratio of shareholders' funds to total assets, decreasing ratio of core capital to weighted assets, non-compliance to prudential guidelines on capital adequacy and failure to provide risk capital for contingencies to a very low extent contribute to increasing capital risk in their banks. These findings show resilience in capital adequacy for listed banks in Kenya. This is supported by proposal by the CBK to the government of Kenya not to review upwards banks statutory capital from 1 billion to 5 billion to allow for financial inclusion indicating bank capital threshold in Kenya is adequate (CBK, 2015).

GLS regression results indicate that capital risk measured by ratio of core capital to total risk weighted negatively and significantly influences stock returns. Adequate capital enable banks of all sizes to diversify risk which boost return on investment and increase survival chances during financial crisis and volatile market environment (Berger & Brouwman, 2011). Core capital forms part the regulated capital. In Kenya, the amount to a minimum threshold of absolute regulatory capital is of 1 billion. The finding in this study shows that any excesses above this limit signify that funds are being locked at the expense of diversifying investment opportunities. Excessive tied up capital is therefore perceived as detrimental to the growth of stock returns. These results findings are expected and conform to the study of Mehri (2015) that

established that inadequacy and consequently excessive capital bears a negative correlation to stock returns.

GLS regression results indicate that capital risk measured by ratio of shareholder's funds to total assets positively and significantly influences stock returns. This signifies capital adequacy promote growth and diversification which boost stock returns (Archaya et al., 2010). Investors perceive shareholders' funds as supplementary capital freely floating and partially tied for the bank management to utilize in exploiting investment opportunities. Any increase in equity capital forms part of untied capital available for risky profitable ventures.

The results on fixed and random effect model controlling for omitted variable bias upon which capital risk influences stock returns indicates capital risk is insignificant on stock returns in the long run under random effect model. However, components of capital risk are jointly significant on stock returns in the short run under fixed effects. These findings imply that after controlling for endogeneity bias of unobserved individual bank effect on the influence of capital risk on stock returns, capital adequacy remains a valuable component in making stock investment decisions in the short run. Analysis of OLS and GLS regressions signify that capital adequacy in the banking industry in Kenya is a predictor of stock returns at NSE.

The results met the expectation of the study and conformed to Modigliani and Miller theory of capital relevance. The significance of influence of capital risk on stock returns is related to the study of Purnamasari et al. (2012), Mehri (2015), Acharya et al. (2010), Wakid et al. (2013). Positive association was found related to the studies of Acharya et al. (2010) and Wakid et al. (2013). Negative relationship conformed to the study of Mehri (2015) that established that capital risk/excessive capital bears a negative correlation to stock returns. Anas and Mohamoud (2013) established that the relationship between financial leverage and stock returns held a negligible effect.

4.9.5 Influence of Financial Risk on Stock Returns

The overall objective of study was to investigate the influence of financial risk on stock returns of listed banks at NSE. The study employed OLS linear regression models which analyzed the perceptions of industry players, GLS regression model which analyzed secondary data on aggregate influence of financial risk on stock returns on listed banks at NSE, Fixed and random effects model which examined the short run effects, long run effects and heterogeneity effects of individual banks upon which financial risk influences stock returns and GARCH (1,1) model which analyzed stock return volatility upon which financial risk influences stock returns. Analysis of the models and discussions are described below.

OLS model

The study used OLS model to analyze primary data on the influence of financial risk on stock returns. The results in table 4.44 presents the model fitness used in the regression. The results indicate $R^2 = 0.668$ and $R = 0.817$ pointing out a strong relationship between independent variables of credit risk, market risk, liquidity risk, capital risk against the dependent variable of stock returns. R^2 indicate that the explanatory power of the model is 0.668. This signifies that about 66.8% of the variation in stock returns is explained by the study model below;

$$SMV = \alpha_0 - \beta_1 CR - \beta_2 MR - \beta_3 LR - \beta_4 CAR$$

Adjusted R^2 is a modified version of R^2 that has been adjusted for irrelevant predictors. An adjusted R^2 of 0.664 which is slightly lower than R^2 value depict a precise explanatory power of financial risks on stock returns. The Adjusted R^2 shows that 66.4% is the precise change in stock returns explained by credit risk, market risk, liquidity risk and capital risk while 33.6% is not explained by the model. Overall, this model reflects that joint effect of credit risk, market risk, liquidity risk and capital risk strongly influences stock returns of commercial banks listed in NSE.

Table 4.44: Model Fitness

Indicator	Coefficient
R	0.817
R Square	0.668
Adjusted R Square	0.664
Std. Error of the Estimate	0.370

- a. Predictors: (Constant), Credit Risk, Market Risk, Liquidity Risk, Capital Risk,

The ANOVA test in table 4.45 indicates that overall, financial risk has a significant influence on stock returns of commercial banks listed in NSE. This is depicted by the F statistic of 151.556 and a p-value of 0.000 which is less than 5% level of significance. The study results under table 4.45 confirm the overall objective of study to investigate the influence of financial risk on stock returns of commercial banks listed in NSE.

Table 4.45: ANOVA of Financial Risk and Stock Returns

	Sum of Squares	df	Mean Square	F	Sig.
Regression	83.008	4	20.752	151.556	0.000
Residual	41.215	301	0.137		
Total	124.222	305			

- a. Predictors: (Constant), Credit Risk, Market Risk, Liquidity Risk, Capital Risk,

- b. Dependent Variable: Stock return

Table 4.46 on model summary was used by the researcher in deciding on whether to accept or reject the hypothesis. The model summary shows the relationship between dependent and independent variables. The study sought to establish the influence of financial risk (credit risk, market risk, liquidity risk and capital risk) on stock returns of commercial banks listed in NSE. The model summary shows that at zero financial risk stock returns increases by 4.48 times.

Table 4.46: Model Summary

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.480	0.120		37.205	0.000
Credit Risk	-0.225	0.038	-0.245	-5.968	0.000
Market Risk	-0.152	0.047	-0.180	-3.218	0.001
Liquidity Risk	-0.250	0.050	-0.282	-4.964	0.000
Capital Risk	-0.245	0.034	-0.294	-7.196	0.000

a. Dependent Variable: Stock Return

H₀₁: Credit risk does not influence stock returns of commercial banks listed in NSE.

The result in table 4.46 indicates credit risk has a negative and significant influence on stock returns of commercial banks listed in NSE with an unstandardized beta coefficient of -0.225 and p-value 0.000. This means that a unitary increase in credit risk will lead to a decrease in stock returns by 22.5%. The results form a basis for study conclusion to reject the null hypothesis and accept the alternative that credit risk influences stock returns of commercial banks listed in NSE.

H₀₂: Market risk does not influence stock returns of commercial banks listed in NSE.

The result in table 4.46 indicates market risk has a negative and significant influence on stock returns of commercial banks listed in NSE with an unstandardized beta coefficient of -0.152 and p-value 0.001. This means that a unitary increase in market risk will lead to a decrease in stock returns by 15.2%. This finding forms a basis for study conclusion for rejecting the null hypothesis and accepting the alternative that market risk influences stock returns of commercial banks listed in NSE.

H03: Liquidity risk does not influence stock returns of commercial banks listed in NSE.

The result in table 4.46 indicates liquidity risk has a negative and significant influence on stock returns of commercial banks listed in NSE with an unstandardized beta coefficient of -0.250 and p-value 0.000. This means that a unitary increase in liquidity risk will lead to a decrease in stock returns by 25%. This finding forms a basis for study conclusion in rejecting the null hypothesis and accepting the alternative that liquidity risk influences stock returns of commercial banks listed in NSE.

H04: Capital risk does not influence stock returns of commercial banks listed in NSE.

The result in table 4.46 indicate capital risk has a negative and significant influence on stock returns of commercial banks listed in NSE (B= -0.245, p=0.000). This means that a unitary increase in capital risk will lead to a decrease in stock return by 24.5%. This builds a study conclusion of rejecting the null hypothesis and accepting the alternative that capital risk influences stock returns of commercial banks listed in NSE. The optimal resultant linear regression model of the study is therefore estimated as below;

$$\text{SMV} = 4.48 - 0.225 \text{ CR} - 0.152 \text{ MR} - 0.250 \text{ LR} - 0.245 \text{ CAR}$$

The model can be interpreted to mean that other factors held constant a marginal increase in credit risk (CR) would results to a marginal decrease of stock returns (SMV) by 0.225. The same can be said regarding market risk (MR), liquidity risk (LR) and capital risk (LR). However, it is noted that marginal negative change in one unit of capital risk (CAR) would lead to largest increase of 0.245 of stock returns.

GLS regression model

To determine the influence of financial risk on stock returns, the study through GLS model regressed predictor variables: credit risk (**npg**), market risk (**fx**), liquidity risk (**ldr**) and capital risk (**cwa**) on stock returns (**R_{it}**). Table 4.47 show results based on the GLS regression (full model). The model tested the collective influence of

financial risk on stock returns. The collective regression model established that influence of credit risk (npg), market risk (fx), liquidity risk (ldr) and capital risk (cwa) on stock returns was found negatively significant with a correlation structure of ARMA (p=2, q=2) with p-values of 0.000, 0.007, 0.026 and 0.002 respectively. The results on the p-values was lower than $\alpha = 0.05$, hence the general conclusion of study that financial risk negatively and significantly influences stock returns of commercial banks listed in NSE. This signifies that investors consider aggregate financial risk affecting banking sector as a critical component in their investment decisions.

Regression Model: Full Model

Table 4.47: Regressing NPG, FX, LDR, CWA, SZ on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Credit risk (npg)	-4.9604	0.5821	-8.5221	0.0004
Market risk (fx)	-6.1222	1.3996	-4.3742	0.0072
Liquidity risk (ldr)	-7.5343	2.4093	-3.1272	0.0260
Capital risk (cwa)	-23.7675	3.9844	-5.9652	0.0019

Table 4.47 the results of the overall GLS model show negative significant coefficients which signify that when risk is combined, it stifles a systemic effect to an optimal point where any increase in risk results into a decrease in stock returns. The model can be interpreted to mean that other factors held constant a unitary increase in credit risk (npg) would results to a marginal decrease of stock returns (R_{it}) by 4.96. The same can be said regarding market risk (fx), liquidity risk (ldr) and capital risk (cwa). The resultant model describes Arbitrage Pricing theory that expected stock returns is a function of multiple beta risk factors. The result also describes a weak form efficient market hypothesis given that investors can utilize

past information on financial risk to make investment decision on stock returns. The model can be stated as:

$$R_{it} = 0 - 4.9604NPG - 6.1222FX - 7.5343LDR - 23.7675CWA$$

Fixed and Random Effect Model

Table 4.48 shows a comparative regression analysis on fixed and random effects to establish the impact of bank individual effects under which financial risk influences stock returns. Despite the comparative and mixed findings on long run FE and RE the study employs Hausman test to discriminate the models and establish the model with most efficient estimators.

Long run Hausman test shows a p-value of 0.960 which indicates that we accept the null hypothesis that unobserved individual bank effects are uncorrelated with financial risks hence at the long run, random effect model is desirable for interpretation. The finding on long run specification indicates that under RE, credit risk, market risk, liquidity risk and capital risk are negatively related to stock returns. The findings on the long run random effects shows R-square of 0.065 which indicates that financial risks assuming bank individual fixed effects are uncorrelated with the disturbance term jointly determine 6.5 % change in stock returns. Long run random effects shows an F statistic of 1.475 with a p-value 0.217 indicating that financial risks are jointly insignificant in influencing stock returns in the long run.

Table 4.48: Influence of Financial Risk on Stock Returns

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	0.2586 (0.1998)	0.1785 (0.3371)	0.1918 (0.3680)	0.2618 (0.0542)
R_{it-1}			-0.1543 (0.2092)	0.6722 (0.0000)
Credit risk (npg)	-0.4689 (0.2187)	-0.4754 (0.2101)	-0.5378 (0.1800)	-0.6016 (0.0882)
Market risk (fx)	-4.7329 (0.3109)	-2.2137 (0.1093)	-4.4574 (0.3586)	-0.7832 (0.0076)
Liquidity risk (ldr)	0.0371 (0.7916)	-0.0361 (0.7967)	0.0960 (0.5189)	-0.0817 (0.5653)
Capital risk (cwa)	-0.3150 (0.4574)	-0.2906 (0.4893)	-0.0441 (0.9257)	-0.7355 (0.1022)
Observations	90	90	90	90
R-Squared	0.788	0.065	0.786	0.562
Hausman Test		0.960		0.000
F statistic	20.977	1.475	17.209	18.996
P-value	0.000	0.217	0.000	0.000
Durbin-Watson	2.474	2.314	2.112	2.501

Table 4.48 also shows the results on short run FE and RE specification. Hausman test on short run FE and RE reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with predictor variables of financial risk hence the fixed effect model is desirable for interpretation in the short run.

The results under short run FE indicates that credit risk, market risk, liquidity and capital risk are negatively related to stock returns. The results on short run fixed effects show R square of 0.786 which indicates that components of financial risk jointly determine 78.6% change in stock returns. Joint effect on short run fixed effects show an F statistic of 17.2 with a p-value of 0.000 indicating that components of financial risk are jointly significant in influencing stock returns in the short run.

GARCH (1, 1) regression model

This section uses GARCH (1, 1) model to analysis the influence of financial risk on stock returns alongside establishing the volatility of stock returns. Modeled volatility is the endogenous risk imbedded to an asset, in this case bank stock. GARCH (1,1) model helps the study to model endogenous and exogenous beta risk factors. GARCH (1, 1) is preferred compared to higher order GARCH models in stabilized series since it captures the greatest variability of the dependent variable over a long period of time. Simple GARCH models are preferred due to their low AIC and BIC values (Waititu et al., 2013). Based on this evidence, the study adopted simple GARCH (1, 1) for numerical stability and parsimony.

Table 4.49 results indicates $R^2 = 0.0687$. This shows that there exists a relative explanatory power of financial risk and conditional variance on stock returns. This implies that 6.87% variation in stock returns is explained by the model $R_{i,t} = u - \beta_1 FR_{i,t} + \sigma_{i,t}^2$. Adjusted $R^2 = 0.0601$ is slightly lower than the R^2 which indicates 6.01% as the precise explanatory power of endogenous and exogenous variables on dependent variable.

Table 4.49 gives the maximum likelihood estimates of the GARCH (1, 1) model showing mean and variance equations. The model variance equation represents the volatility model part of the regression which shows ARCH and the GARCH term significantly influence conditional variance of stock returns with p-values 0.0226 and 0.000 respectively. The constant, ARCH and the GARCH coefficients are all non-negative and the magnitude of ARCH parameter is smaller than the magnitude of the

GARCH parameter as expected by the study. This signifies that the effect of the last period shock ($\epsilon_{i,t-1}^2$) on stock return volatility is smaller than the effect of the previous surprise ($\sigma_{i,t-1}^2$). This finding indicate the market has a longer memory than the previous period and that volatility is more sensitive to its own lagged values than it is to new surprises in the market place. The GARCH term established model persistence with total ARCH (0.200999) and GARCH (0.714096) coefficients of 0.915095 which is closer to 1.0. This establishment is in line with the study of Predescu and Stancu (2011), Waititu et al. (2013) and Muiruri (2014). GARCH (1, 1) fitted model on variance equation can be described by the equation below:

$$\sigma_{i,t}^2=0.000192+0.200999 \epsilon_{i,t-1}^2 + 0.714096 \sigma_{i,t-1}^2$$

Table 4.49 also displays the results of the estimated mean equation on GARCH (1, 1) model which represent the effect of financial risk measured by the rate of change of exchange KSH/USD exchange rate on stock returns. The results indicate that financial risk negatively and significantly influences stock returns with a coefficient of -0.356818 and p-value of 0.0104 respectively. The results also show the influence of stock returns volatility on stock returns is supported by significance of ARCH and GARCH terms. The modeling results indicated that there existed a significant influence of financial risk being exogenous variable and conditional variance being endogenous variable on stock returns. The overall null hypothesis is therefore rejected that;

H₀₆: Financial risk does not influence stock returns of commercial banks listed in Nairobi Securities Exchange.

Table 4.49: Financial risk, Stock returns volatility and Stock Returns

Dependent Variable: R_{it}

Method: ML - ARCH- Normal distribution

Mean Equation : $R_{i,t} = u - \beta_0 FR_{it}$

Variance Equation : $\sigma_{i,t}^2 = w + \alpha_1 \epsilon_{i,t-1}^2 + \beta_1 \sigma_{i,t-1}^2$

Mean Equation				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
FR	-0.356818	0.139320	-2.561139	0.0104
u	0.002488	0.004939	0.503810	0.6144
Variance Equation				
W	0.000192	0.000164	1.174880	0.2400
$\epsilon_{i,t-1}^2$	0.200999	0.088151	2.280165	0.0226
$\sigma_{i,t-1}^2$	0.714096	0.122025	5.852058	0.0000
R-squared	0.068656	Mean dependent var		-0.001468
Adjusted R-squared	0.060112	S.D. dependent var		0.050856
S.E. of regression	0.049304	Akaike info criterion		-3.267073
Sum squared resid	0.264962	Schwarz criterion		-3.145022
Log likelihood	186.3226	Hannan-Quinn criter.		-3.217561
Durbin-Watson stat	1.561072			

The overall GARCH (1, 1) model on mean and variance equation can therefore be fitted as below:

$R_{i,t} = u + \beta_0 FR_{t-1} + \epsilon_{i,t}$ overall model before volatility modeling

$R_{it} = 0.002488 - 0.356818 FR_{it}$ modeled mean equation

$\sigma_{i,t}^2 = 0.000192 + 0.200999 \epsilon_{i,t-1}^2 + 0.714096 \sigma_{i,t-1}^2$ modeled variance equation

$$R_{i,t} = 0.002488 - 0.356818 \text{ FR}_{i,t} + (0.000192 + 0.200999 \epsilon_{i,t-1}^2 + 0.714096 \sigma_{i,t-1}^2)$$

..... overall model (Mean and Variance equation combined)

The model can be interpreted to mean that other factors held constant a marginal increase in financial risk (FR) would result to a marginal decrease of stock returns by 0.356818. Assuming a market free of financial risk and stock returns volatility, investment in bank returns in NSE will yield a risk-free return of 0.002488. However, there exist high persistence as ARCH and GARCH coefficients increase towards one ($\alpha_1 + \beta_1 < 1$) signaling a high sensitivity of stock returns to stock return volatility. Positive α_1 and β_1 coefficients imply that as risk increases, the expected return also increases. The p-value of $\epsilon_{i,t-1}^2 = 0.0226$ and $\sigma_{i,t-1}^2 = 0.000$ indicate the significance of the influence of stock return volatility on expected stock returns. This relationship of risk and returns under mean and variance equations of GARCH models aligns to both APT and MPT theories.

Discussion of Findings

The result from OLS model on primary data indicates that credit risk, market risk, liquidity risk and capital risk jointly and individually have a negative significant effect on stock returns of banks listed in NSE. Similar results are obtained from overall GLS regression model which established that credit risk, market risk, liquidity risk and capital risk are individually and jointly significant on stock returns. The results on fixed and random effect model controlling for omitted variable bias upon which financial risk influences stock returns indicates financial risk is insignificant on stock returns in the long run under random effect model. However, components of financial risk are jointly significant on stock returns in the short run under fixed effects. Findings from estimated GARCH (1, 1) model indicate financial risk influences stock returns. GARCH model also establishes that stock returns volatility is mean reverting implying that losses and gains of banking stocks revolve along the same mean over a long period of time making it possible for investors to predict returns.

The finding on high persistence value indicated by the variance equation of GARCH model is evidence that stock return volatility is a predictor of stock returns. The influence of volatility of stock returns on stock returns is evidenced by significance of ARCH and GARCH. Significant GARCH model (Mean and Variance equations combined) imply capital asset pricing model that expected return is a factor of asset risk and arbitrage pricing model that expected return is a factor of multi-beta risk factors holds for this study. It is also an indication that financial risk is contagious and cyclical where stock return endogenous (systemic) risk triggers stock returns exogenous(external) risk and vice versa. The study concludes that financial risk influences stock returns which conforms to the findings according to Mouna and Anis (2015), Wycliffe and Muriu (2014) and Sobia et al. (2015). However, Sukcharoensin (2013) found an interesting phenomenon that for large banks, the influence of financial risk is on stock returns is significant only in the short run. Large banks are expected to hedge the financial risk at the long run. This phenomenon has been proven in this study under fixed and random effect model.

The four model results indicate financial risk significantly influences stock returns. It also indicates relevance of MPT, APT and EMH theories in relation to the influence of financial risk on stock returns. Relevance of MPT theory is described by existence significant relationship between financial risk and stock returns. Relevance of APT theory is established by proof that bank stock returns in NSE are a function of a series of beta risk factors defined by factors of financial risk. Relevance of EMH theory is established by the confirmation that financial risk measured by information based on past trends influences stock returns. Evidence that stock return volatility influences stock returns demonstrate that previous information and behavior of bank stocks is useful in determining future returns. This phenomenon describes NSE as weakly efficient market. Overall findings can be compared with the following studies. Mehri (2015) established credit and capital risk influences stock returns. Cheng and Nasir (2010) found liquidity risk negatively influences stock returns while Sukcharoensin (2013) concluded interest rates and exchange rates are good predictors of stock returns.

The relationship between financial risk and stock returns can be deduced systemic global and local trends which include collapse of global commodity prices, slowed global and local economic growth rate post global financial crisis. Introduction of interest rate capping has prompted liquidity risk which is systemic and contagious to credit risk. Devalued Kenya shilling, Kenya high public debt and slowed foreign direct investments are key to increasing market risk. Quantitative easing by the federal reserve bank has escalated the reduction of Diaspora remittance to Kenya from USA (CBK, 2015). In 2015, the CBK placed 3 banks under statutory management a move that diluted investor confidence on banking stocks and constrained the funding and market liquidity which constrains demand for stocks in NSE leading to plummeting of bank stocks at NSE. The study established that increasing credit risk, market risk and liquidity risk are systemic and pro-cyclical with tendencies to have a negative systemic multiplicative effect in the economy. This tendency provokes capital risk where loan provision and other associated capital risk are required to absorb the probable losses. These observations explain the increase of financial risk indicators in Kenya and associated reduction in stock returns especially for the banking sector (Forbes, 2016).

4.9.6 Moderating effect of Bank size on the influence of financial risk on Stock Returns

The fifth objective was to investigate the moderating effect of bank size on the influence of financial risk on stock returns of listed banks at NSE. All the components of financial risk (credit risk, market risk, liquidity risk and capital risk) were merged to obtain one composite variable of financial risks (FR). The model determined the moderator/interaction term ($ZS*FR$) by multiplying the centered terms of the predictors variables of financial risk (FR) and bank size (ZS). The study started by establishing bank size and financial risk as an explanatory variable of stock returns under model one and later the effect of the interaction term between bank size and financial risk on stock returns under model two. The decision criterion was based on significance of bank size as an explanatory variable under model one and the significance of the interaction term under model two.

OLS regression model

The results in table 4.50a presents the model fitness used in the regression model one and two under table 4.50a. The model one fitness results indicate R^2 of 0.831 implying that 83.1% variation in stock returns is explained by the model $SMV = \alpha_0 + \beta_1FR + \beta_2ZS$. Overall model two indicates R^2 of 0.832 signifying that 83.2% variation in stock returns is explained by the model $SMV = \alpha_0 + \beta_1FR + \beta_2ZS - \beta_3ZS*FR$. However, R square change under model two is insignificant (0.001) indicating that additional predictor interaction term does not predict variations in stock returns.

Table 4.50a: Model Fitness Summary

Model	Change Statistics						
	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
1	.912 ^a	.831	.830	.2629	.831	746.806	.000
2	.912 ^b	.832	.830	.2632	.000	.406	.525

a. Predictors: (Constant), Financial Risk, Bank Size

b. Predictors: (Constant), Financial Risk, Bank Size, Moderator

Table 4.50b provides results on regression coefficients. Model one results indicate that financial risk and bank size are individually and jointly significant in influencing stock return with beta coefficient of -.292; p-value .000<0.05 and .692; p-value=.000<0.05 respectively. Model two results indicate that additional interaction term variable is insignificant in influencing stock returns with beta coefficient of .03 which is not significantly different from zero with a p-value of .525>0.05. Therefore, under OLS model the null hypothesis that bank size does not have a moderating effect on the influence of financial risk on stock returns of banks listed in NSE is accepted.

Table 4.50b: Regression coefficients on Moderating effect of Bank size

Model		Unstandardized		Standardized		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	1.443	.193		7.490	.000
	Bank Size	.692	.040	.677	17.255	.000
	Financial Risk	-.292	.042	-.275	-7.006	.000
2	(Constant)	1.447	.193		7.500	.000
	Bank Size	.695	.040	.679	17.230	.000
	Financial Risk	-.291	.042	-.275	-6.993	.000
	Interaction term	.030	.047	.015	.637	.525

a. Dependent Variable: Stock Return

This findings are summarized by the model below;

$$SMV = 1.443 - 0.292FR + 0.695ZS$$

The explanatory model above implies that unitary increase in bank size will lead to an increase in stock returns by 69.5% while unitary increase in financial risk will lead to a 29.2% decrease in stock returns.

$$SMV = 1.447 - 0.291FR + 0.695ZS + 0.03ZS*FR$$

The moderating model above implies that unitary increase in bank size will lead to an increase in stock returns by 69.5% while unitary increase in financial risk will lead to a 29.1% decrease in stock returns. However, the interaction term of bank size and financial risk increased stock returns by 3% but this change is insignificant under this model.

GLS regression model

Table 4.51a shows the GLS regression results with a correlation structure of ARMA (2, 2). The result show that, bank size is positively significant in influencing stock returns with p-value results of 0.0186 while financial risk is found to be negatively significant with p-value of 0.0204 at 5% level of significance.

Table 4.51a: Bank Size (Explanatory Variable): Regressing FR and ZS on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Financial risk(FR)	-13.3808	4.6383	-2.8848	0.0204
Bank Size(ZS)	0.2308	0.0784	2.9430	0.0186

The result in table 4.51a concludes that bank size is a good predictor of stock returns. Other factors held constant this means that a unitary increase in bank size will lead to an increase in stock returns by 0.2308 times. This is findings are summarized by the model below;

$$R_{it} = 0 - 13.3808FR + 0.2308 ZS$$

Table 4.51b shows the GLS regression results with a correlation structure of ARMA (4, 4). The study regressed a composite factor of aggregate financial risk (FR), aggregate bank size (SZ) and the interaction term (FR*SZ) against stock returns (R_{it}). The result shows the effect of the interaction term (FR*ZS) on stock returns was found to be negatively significant with a p-value of 0.0049 which is lower than 5% level of significance. These results signify that large banks are riskier to invest in compared to small banks. The regression results concluded that there exists moderating effect of bank size on the influence of financial risk on stock returns. The null hypothesis is therefore rejected that;

H₀₅: Bank size does not have a moderating effect on the influence of financial risk on stock returns of commercial banks listed in NSE.

Table 4.51b: Moderating Factor: Regressing FR, ZS, FR*ZS on R_{it}

Predictors	Dependent Variable: Stock Returns			
	Coefficient	Standard Error	t-value	p-value
Financial risk(FR)	-23.8601	1.0572	-22.5702	0.0000
Bank Size(ZS)	0.4069	0.0179	22.7467	0.0000
Interaction Term(FR*ZS)	-4.2245	1.0441	-4.046	0.0049

The model results can be interpreted as a unitary increase in interaction term between bank size and financial risk will lead to decrease in stock returns by 4.2 times. Equation below summarizes the model on moderation effect of bank size;

$$R_{it} = 0 - 23.8601 \text{ FR} + 0.4069 \text{ ZS} - 4.2245 \text{ FR*ZS}$$

Fixed and Random Effect Model

To establish the moderating effect of bank size on the influence of financial risk on stock returns factoring the short run effects, long run effects and the impact of unobserved individual bank effects; the study first established bank size as an explanatory variable on stock returns then the moderating effect was established by introducing the interaction term of bank size and financial risk on the regression.

Table 4.52a: Banks Size as an Explanatory Variable.

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	-0.4749 (0.2327)	-0.4249 (0.2966)	-0.3770 (0.3955)	-0.7155 (0.0453)
R _{it-1}			-0.1239 (0.3417)	0.7488 (0.0000)
Financial Risk (FR)	-0.2062 (0.6674)	-0.2929 (0.5391)	-0.0423 (0.9342)	-1.1235 (0.0143)
Bank Size (ZS)	0.0409 (0.1064)	0.0389 (0.1208)	0.0326 (0.2574)	0.0707 (0.0027)
Observations	90	90	90	90
R-Squared	0.7789	0.0345	0.7809	0.5668
Hausman Test		0.2333		0.000
F statistic	24.977	1.554	19.902	33.140
P-value	0.000	0.217	0.000	0.000
Durbin-Watson	2.2675	2.0142	2.0064	2.5022

Table 4.52a shows the results of bank size as an explanatory variable. At the long run, Hausman test reveals a p-value of 0.23 which indicates that we accept the null hypothesis that unobserved individual bank effects are uncorrelated with bank size hence random effect model is desirable for interpretation. The findings on random long run specification indicates bank size is positively related to stock returns with R-square of 0.0345 which indicates that bank size jointly with financial risks determine 3.5% change in stock returns. Long run random effects shows an F statistic of 1.55 with a p-value 0.22 indicating that bank size and financial risk are jointly insignificant in influencing stock returns.

At the short run, Hausman test reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with bank size hence fixed effect model is desirable for interpretation. The findings on fixed short run specification indicates bank size is positively related to stock returns with R-square of 0.7809 which indicates that bank size jointly with financial risks determine 78% change in stock returns. Short run fixed effects show an F statistic of 19.9 with a p-value 0.000 which indicated that bank size and financial risk are jointly significant in influencing stock returns.

Table 4.52b: Bank Size as a Moderator Variable

Variables	Long Run Models		Short Run Models	
	Fixed Effects	Random Effects	Dynamic Fixed Effects	Dynamic Random Effects
Constant	-0.4880 (0.2384)	-0.4208 (0.3184)	-0.4082 (0.3865)	-0.7200 (0.0502)
R_{it-1}			-0.1195 (0.3682)	0.7496 (0.0000)
Financial Risk (FR)	-0.1709 (0.7596)	-0.3037 (0.5833)	0.0213 (0.9717)	-1.1096 (0.0325)
Bank Size (ZS)	0.0412 (0.1077)	0.0388 (0.1257)	0.0337 (0.2529)	0.0708 (0.0029)
Interaction (FR*ZS)	-0.0604 (0.8998)	-0.0169 (0.9718)	-0.1078 (0.8344)	-0.0282 (0.9529)
Observations	90	90	90	90
R-Squared	0.788	0.087	0.7811	0.5668
Hausman Test		0.949		0.000
F statistic	22.608	1.024	18.112	24.529
P-value	0.000	0.386	0.000	0.000
Durbin-Watson	2.2664	2.0122	2.2664	2.4022

Table 4.52b shows the results of bank size as a moderator variable. At the long run, Hausman test reveals a p-value of 0.949 which indicates that we accept the null

hypothesis that unobserved individual bank effects are uncorrelated with interaction term of bank size and financial risk hence random effect model is desirable for interpretation. The findings on random long run specification indicates interaction term is negatively related to stock returns with R-square of 0.087 which indicates that interaction term jointly with financial risks determine 8.7 % change in stock returns which is an increase of 3.5% compared rate of change on explanatory variable model under table 4.52a. Long run random effects shows an F statistic of 1.02 with a p-value 0.39 indicating that interaction term and financial risk are jointly insignificant in influencing stock returns.

At the short run, Hausman test reveals a p-value of 0.000 which indicates that we reject the null hypothesis that unobserved individual bank effects are uncorrelated with bank size hence fixed effect model is desirable for interpretation. The findings on fixed short run specification indicates an interaction term is negatively related to stock returns with R-square of 0.7811 indicating that interaction term, bank size and financial risks jointly determine 78.11 % change in stock returns which is an increase of 0.02% compared rate of change on explanatory variable model under table 4.52a. Short run fixed effects show an F statistic of 18.11 with a p-value 0.000 which indicated that interaction term, bank size and financial risk are jointly significant in influencing stock returns.

Table 4.52c: Influence of Moderated Credit Risk, Market Risk, Liquidity Risk and Capital Risk on Stock Returns

Predictor Variables:	DV: Stock Returns			
	Coefficient	SE	t-value	p-value
Constant	-1.0473	0.3321	-3.1540	0.0253
Credit risk* Bank Size	0.6679	0.2548	2.6217	0.0470
Market risk *Bank Size	-0.5342	0.1328	-4.0212	0.0101
Liquidity risk * Bank Size	0.1428	0.0224	6.3646	0.0014
Capital risk * Bank Size	-0.2567	0.1365	-1.8808	0.1187

Table 4.52c shows the GLS regression results of moderated influence of credit risk, market risk, liquidity risk and capital risk on stock returns. The study regressed the

interaction term of credit risk and bank size against stock returns and established significant p-value of 0.0470 with a positive coefficient of 0.6679. Comparing the results with the influence of non-moderated credit risk on stock returns in table 4.47, the study establishes similarity on the level of significance. However, the direction of influence differs with non-moderated influence of credit risk on stock returns being negative.

The study found the influence of moderated market risk against stock returns is significant with p-value of 0.0014 with a coefficient of 0.1428. The study established the level of significance and the direction of influence is similar to that of unmoderated market risk on stock returns as shown in table 4.47. Table 4.51c also shows the results of moderated influence of liquidity risk on stock returns. The study established significant p-value of 0.0470 with a positive coefficient of 0.6679. Comparing the results with that of unmoderated liquidity risk on stock returns in table 4.47; the study established similarity on the level of significance. However, the direction of influence differed where non-moderated influence of liquidity risk on stock returns was found to be negative.

Table 4.52c finally shows regression of moderated influence of capital risk on stock returns. The study established insignificant p-value of 0.1187 with a coefficient of -0.2567. Comparing the results with regression of unmoderated capital risk on stock returns in table 4.47; the study established similarity in the direction of influence but found a contrast on the level of significance. The overall GLS model on the influence of moderated credit risk, market risk, liquidity risk and capital risk on stock returns can be summarized as below:

$$R_{it} = -1.0473 + 0.6679NPG*ZS - 0.5342FX*ZS + 0.1428LDR*ZS - 0.2567CWA*ZS$$

The model can be interpreted to mean that other factors held constant a unitary increase in moderated credit risk (npg.zs) would result to a marginal increase of stock returns (R_{it}) by 0.6679. The same can be said regarding moderated market risk (fx.zs), liquidity risk (ldr.zs) and capital risk (cwa.zs).

Discussion of Findings

The results of bank size as an explanatory variable from primary data, OLS model and secondary data, GLS model indicates bank size has a significant positive effect on the stock returns of commercial banks listed in NSE. The results from long run random effect indicate a positive insignificant effect while the short run fixed effects indicated significant positive influence on stock returns. Individual construct tested indicate that asset base, capital size, market capitalization, revenue size and customer base determine the magnitude of bank size for commercial banks listed in NSE. Positive relationship between bank size and stock returns aligns with significance influence of bank size on profitability (Laeven et al., 2014). Big banks maximize economies of scale and reduce their risk as they diversify their investments. It also follows that during periods of economic downtimes big banks may not be able to monitor and control the contagious effects of financial risk (Berger & Brouwman, 2011; El Mehdi, 2014 & Aga et al., 2013).

The results of bank size as a moderator from primary data, OLS model indicate bank size does not moderate the influence of financial risk on stock returns. The results from GLS model indicate that bank size has a significant negative moderating effect on the influence of financial risk on stock returns as evidenced by the p-value = 0.00049 and a coefficient of -4.2245 in table 4.50b. The results on omitted variable bias indicate that the bank size has joint significant moderating effect on the influence of financial risk on stock returns in the short run under fixed effects model. Due to inconsistency of findings on moderation effects, the study adopted GLS model and short run fixed effects models build on secondary data for interpretation. GLS model findings signify that as size of the bank increases, investment in bank stock becomes risky ventures at size of banks increase. It conforms to investment strategy that small firm's stocks have higher returns than stocks of large firms (Laeven et al., 2014).

GLS model findings on the moderated influence of credit risk on stock returns concluded that bank size has a positive moderating effect in the influence of credit risk on stock returns. This is explained by the fact that, large banks, supported by huge deposit base lend to different sectors of the economy from small and medium enterprises to corporate firms. The client portfolio ranges from secured to unsecured

loan portfolio. This finding also indicate that for large banks can afford an elaborated framework to diversified lending resulting to overall reduced credit risk and increased revenue. However, large banks have a high-risk appetite which results to market based products such a derivative credit instruments which are disastrous to banks and economy in cases of economic depression (Boot & Ratnovski, 2012). In Kenya, unsecured mobile lending is one of risky credit extensions adopted by big banks which poses a likely trigger of next financial risk menace in Kenya financial system.

The study findings established that bank size is considered to enhance negatively the influence of market risk on stock returns. The explanation towards this phenomenon can be attributed to fact that large banks serve diversified geographies and economic sectors. During time of harsh economic conditions, cyclicity, contagion, and systemic nature of market risk, render big banks vulnerable. This can be evidenced by the economic destructions due to collapse of large banks experienced during global financial crisis (Laeven, et al., 2014). In Kenya, there is need to save guard large banks as they constitute a significant portion of the blue-chip stocks trading at NSE.

The study established a positive influence of moderated liquidity risk on stock returns. This means that as large banks increase the ratio of loans to deposits, stock returns due to investors also increases. This could be attributed by the confidence investors have on wide range innovations that large banks in Kenya uses to attract funding liquidity. Contrary to the findings on moderated credit, market and liquidity risk, the study has found that bank size does not have a moderating effect on the influence of capital risk on stock returns (Claessens et al., 2011). This phenomenon can be attributed to that fact that bank capital is regulated with the minimum ratio of core capital to weighted average assets being regulated 8% according to Basel iii provisions. It follows that banks are not keen to increase this capital baseline as long as the regulatory threshold has been reached. This fact is supported by the fact that most Kenyan banks are small banks in tier 3 (Banking Survey, 2016).

Overall, bank size is established to have a negatively affect the influence of financial risk on stock returns. The advent of increase in financial innovation and deregulation has witnessed large banks engage in market based activities outside traditional lending. Although large banks benefit from economies of scale by diversification and reduced risk, it prompts bank to operate on lean capital and unstable funding (Vinals et al., 2013). Too big to fall syndrome tempts banks to higher leverage and engagement in risky market based activities. Large banks are prone to consequences of managerial empire building and bad governance. These facts make large banks more fragile business model. Failure of large banks is more disruptive and highly systemic to financial system (Laeven et al., 2014). The adverse impact of large banks on the economy in Kenya can be attributed to impact of the law on capping of lending rates. Banks profitability and trading in NSE reduced drastically after the enactment of the law occasioned by shrinking of market liquidity attributed by reduction of loans advanced by banks. This phenomenon has led to questions as what entails the optimal size of bank.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The primary purpose of this study was to investigate the influence of financial risk on stock returns of commercial banks listed in NSE. The study has been anchored around a theoretical fundamental which posits that variation in stock returns are explained by changes in financial risk. In this chapter, the study commences by summarizing the findings made earlier. It proceeds to discuss the objectives and results of the hypotheses tested in its conclusion. It uses theoretical and empirical literature to compare results of the study. The conclusions are drawn from the study results and the implications of the results drawn and used to give recommendations on implications and improvement of policy frameworks to bank managers, investors, regulators, and professionals.

5.2 Summary of Findings

The study analyzed, discussed and interpreted study findings the in previous chapter. In this section, research findings and interpretations are summarized per objectives of study.

5.2.1 The Influence of Credit Risk on Stock Returns

The results from OLS model on primary data indicate credit risk is negatively significant in influencing stock returns of commercial banks listed in NSE. GLS regression result indicate that the influence of credit risk measured by the ratio of non-performing loans to gross loans is positively significant to stock returns while the ratio of loan loss provisions to gross loans is established negatively significant against stock returns. The effect of unobserved individual bank effect upon which credit risk influences stock returns was established to be negatively insignificant in influencing stock returns at the long run. However, the ratios of non-performing loans and loan provision were established to be jointly and negatively significant in influencing stock returns at the short run.

5.2.2 The Influence of Market Risk on Stock Returns

The results from OLS model on primary data indicated market risk was negatively significant in influencing stock returns of commercial banks listed in NSE. GLS regression results showed the influence of market risk measured by rate of change in exchange rates on Kes/Usd is negatively insignificantly against stock returns while market risk measured by rate of change of interest rates is significantly negative against stock returns. The fixed and random effect controlling for omitted variable bias under which market risk influences stock returns indicates rate of change of exchange rate and rate of change of interest rates are individually and jointly negatively significant on stock returns both at the long run and in the short run.

5.2.3 The Influence of Liquidity Risk on Stock Returns

The results from OLS model on primary data indicates liquidity risk is negatively significant in influencing stock returns of commercial banks listed in NSE. GLS regression model established that aggregate liquidity risk measured by ratio of loans to deposits negatively influences stock returns while the ratio of liquid assets to total assets positively influences stock returns. The effect of controlling omitted variable bias upon which liquidity risk influences stock returns indicates liquidity risk does not influence stock returns at the long run. However, components of liquidity risk jointly influence stock returns in the short run.

5.2.4 The Influence of Capital Risk on Stock Returns

The results from OLS model on primary data indicate capital risk is negatively significant in influencing stock returns of commercial banks listed in NSE. GLS regression model established that aggregate capital risk measured by ratio of core capital to risk weighted assets negatively influences stock returns. However, capital risk measured by ratio of shareholder's funds to total assets was found to positively influence stock returns. The effect of controlling omitted variable bias upon which capital risk influences stock returns indicates capital risk does not influence stock returns at the long run. However, components of capital risk jointly influence stock returns in the short run.

5.2.5 Influence of Financial Risk on Stock Returns

Methodology of OLS model was applied on primary data collected to administer the influence of financial risk on stock returns of listed banks at NSE. The study established that credit risk, market risk, liquidity risk and capital risk individually and jointly were negatively significant in influencing stock returns. These findings aligns with the current challenging environment in the banking sector in Kenya.

GLS regression model was based on secondary data to analyse the aggregate influence of credit risk by ratio of non performing loans, market risk by rate of change of exchange rate, liquidity risk by loans to deposit ratio and capital risk by ratio of core capital to risk weighted assets on stock return of listed bank at NSE. The study established that credit risk, market risk, liquidity risk and capital risk jointly were negatively significant in influencing stock returns.

The results on fixed and random effect model controlling for omitted variable bias upon which financial risk influences stock returns indicates financial risk is insignificant on stock returns at the long run under random effect model. However, components of financial risk are jointly significant on stock returns in the short run under fixed effects.

Using GARCH approach, the study determined the influence of financial risk on stock returns. The mean equation from GARCH model indicated that financial risk negatively and significantly influence stock returns. Variance equation of GARCH model established that variability of returns hereby referred to as endogenous risk is a stock return generating process hence stock variability was found predictive of stock returns. This findings conform to the findings of OLS, GLS, fixed and random models in this study satisfying the methodical, conceptual and contextual gap that financial risk influences stock returns of banks listed in NSE.

5.2.6 The Moderating Effect of Bank Size on the Influence of Financial Risk on Stock Returns

The findings on OLS model indicate bank size has a positive but insignificant moderating effect on the influence of financial risk on stock returns. GLS model findings show that bank size negatively enhances the degree under which financial risk influence stock returns. The results on omitted variable bias indicate that the bank size has joint significant moderating effect on the influence of financial risk on stock returns in the short run. Findings on moderating effect of bank size on individual risk indicate that bank size positively affect the influence of credit risk and liquidity risk on stock returns. However, bank size was established to have a negative moderating effect on the influence of market risk on stock returns. Nonetheless, bank size was found to have no effect on the influence of capital risk on stock returns.

5.3 Conclusion

Conclusions were deduced on the influence of independent variables (credit risk, market risk, liquidity risk, and capital risk) on stock returns. Conclusion was also drawn on moderating effect of bank size on the influence of financial risk on stock returns of commercial banks listed in NSE. For consistency purposes, the study used primary and secondary data to draw conclusions where there was uniformity of findings. In few cases where there was contradiction on findings, the study adopted purely secondary data findings in to draw conclusion. Primary data is based on individuals' perceptions were as secondary data is factual. Secondary data is therefore deemed to give a more conclusive implication to theory, knowledge, and practice.

5.3.1 The Influence of Credit Risk on Stock Returns

Listed banks diversify lending to risky segments (SME, credit cards and digital loans). Although this may increase profits in the short run, it leads to high non-performing loans and subsequently high loans provisions which adversely affects dividends and demand for bank stock at NSE. In the long run, individual banks adopt effective credit risk management and hedging strategies. The levels of non-

performing loans and that of loss provisions is confirmed to determine investment decisions on banking stock at NSE.

5.3.2 The Influence of Market Risk on Stock returns

Market risk determined by the rate of change on interest rate and exchange rate indicate a negative and significant influence on stock returns. The study concluded that banking industry has been able to hedge exchange risk making its less impactful on stock returns in the long run. However, individual banks stock returns are still vulnerable to impact of exchange rate risk. As interest rate risk increases, investors change investment from equity market to bond market. This reduces demand for stocks and consequently reduction in stock prices and returns. The study concluded market risk explain variations in stock returns.

5.3.3 The Influence of Liquidity Risk on Stock Returns

As excitements on credit extensions increase loans to deposit ratio making banks suffer inadequate funding liquidity. This trigger inadequate market liquidity which adversely affect demand for bank stocks. Failure to match liquid assets with cash flow needs, failure to review liquidity limits and positions increases liquidity risk and consequently natively affects stock returns. Long run insignificant effect of liquidity risk on stock returns, indicate that individual banks adopt to effective liquidity risk hedging strategies over time. Large banks are found to increase stock returns even with minimal liquidity compared to small banks. The study concludes liquidity risk is a key consideration in investment decisions on banking stock at NSE.

5.3.4 The Influence of Capital Risk on Stock returns

Holding excessive tied up capital at the expense of diversified investments is detrimental to bank stock returns. Untied capital helps banks in risky ventures and absorbs systemic stress thus positively influences bank stock returns. Core bank capital is regulated and tied up thus any increase negatively affect stock returns. Bank size does not affect how capital adequacy affects stock returns. This can be

associated with the fact that capital is regulated in statutory ratio and absolute amount.

5.3.5 The Influence of Financial Risk on Stock returns

Overall findings on OLS model, GLS model, Fixed and random effect model for endogeneity bias and GARCH (1, 1) for stock volatility modelling; indicate that financial risk significantly influences stock returns. The direction of influence is largely negative conforming to the turbulent banking environment in Kenya. However, significance of influence is twofold. Industry influence of financial risk on stock returns is significant in the long run; implying that industry financial risk is highly systemic and therefore cannot be diversified. However, influence of individual banks financial risk on stock returns is significant in the short run. In the long run banks adapt to hedging strategies and prudent way of managing risk. There is also possibility that monetary policy measures to control risk take shape in the long run. The study conforms to MPT theory on risk- returns trade off and APT that stock return is a function of multiple beta risk factors. The study also conforms to EMH theory that NSE is weakly efficient given that bank stock returns are significantly influenced by financial risk constituted by past financial information.

5.3.6 The Moderating Effect of Bank Size on the Influence of Financial Risk on Stock Returns

The study concludes bank size bears moderating effect on the relationship between financial risk and stock returns of commercial banks listed in the NSE. The findings on moderation effect indicate that although bank size is key in enhancing bank risk appetite and diversification; during depressed economic conditions, big banks are highly affected by financial risk which adversely affect stock returns. This phenomenon is well described on the impact of big banks during financial crisis. Core bank capital is regulated and tied up. This explains the reason moderated capital risk was not significant on stock returns.

5.4 Recommendations

Following the findings and the implications of the study on the influence of financial risk on stock returns of commercial banks listed in NSE, the study gives the following recommendations.

5.4.1 Managerial Recommendations

The management of listed banks to design impeccable financial risk management strategies that check lending appetite, define optimal lending on unsecured loans and improve monitoring and control of non-performing loans; upscale prudent hedging and stress testing on systemic risks; hold adequate loan to deposit ratio and ensure liquid assets match cashflow requirements; hold adequate capital reserves and risk capital charges to boost risk diversification, venturing into new frontiers and match size to capital.

5.4.2 Policy Recommendations

The government policy making organs to increase oversight on banks and stock market. CBK to ensure banks holds recommended thresholds of financial risk such as portfolio at risk, funding liquidity, core capital and regulatory capital adequacy ratios that match bank size, formulate sustainable monetary policy to regulate and control interest and exchange rates. CMA to enforce effective corporate governance, market discipline, transparency, and disclosures.

5.4.3 Investor Recommendations

Investors to consider financial risk in their investment decision. They should consider financial discipline and disclosures by banks. They should also consider the state of the economy against the size of banks before placing their investments. Passive investors are advised to invest long term in banking stocks.

5.5 Suggestion for Further Research

This study serves as a significant pillar for further research in this field especially in Kenya. The study provides empirical evidence on strong explanatory power of statistical models on determinants of financial risk and how they affect stock returns using OLS, GLS, fixed and random and GARCH model. The study not only establishes that internal and external determinants of stock returns but also recognizes their influence is also based on time and conditions of the economy as well as the size of the institution. Despite the findings of the model used being credible for generalisation, further studies on influence of financial risk on stock returns can be explored using other models such as an Event study.

The study proposes the following directions for further research. That a comparative study can be explored in other sectors of the economy which are sensitive to financial risk such as the insurance and energy sectors. With introduction of derivative trading at NSE, subject to availability of data, influence of financial risk on stock returns where financial risk is measured by derivative instruments such as credit spreads and credit default swaps can be explored to test the relationships and relevance of asset pricing models.

Future researchers and regulators could also consider exploring a measure of optimal bank size and how it relates with systemic risk when establishing influence of financial risk on stock returns. This will help stakeholders to respond appropriately when thresholds of bank size are exceeded especially during times of financial crisis. Further research should also consider introducing different moderating variables such as market capitalization. As per the knowledge of the researcher, the study is a pioneer study in Kenya being a spatial extension of the previous research exploring influence of financial risk on bank performance. The extension covered under this study is valuable and efficient to existing literature in filling contextual, conceptual, and methodical gaps in relation to influence of financial risk on stock returns.

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APPENDICES

Appendix 1: Questionnaire

Dear Respondent,

I am currently a PhD student at JKUAT. I am undertaking a study to investigate the influence of financial risk on the stock returns of commercial banks listed in the Nairobi Securities Exchange. The purpose of this questionnaire is to collect data for academic use only. All the information provided herein shall be treated with utmost confidence. You need **not to** indicate your name or any other identification details in this questionnaire.

Kindly answer all the questions by ticking the option(s) and filling blank spaces provided.

Please indicate (Tick as appropriate).

a) Financial Institution(optional)

b) Age (Years)

18 – 29	30 -39	40 – 49	50-59	60 and Over

c) Level of education

Certificate	
Diploma	
University – 1 st Degree	
University - Post Graduate (Masters)	
University - Post Graduate (PhD)	
Others specify.....	

d) What is your current position in your bank

Director

General Manager

Head of Department

Manager

Others (Please Specify).....

e) Please tick your department?

Credit	
Operations	
Treasury	
Finance	
Risk	
Others (Please Specify)	

f) Has the stock return of your bank experienced a decline in the last five years?

Yes No

g) Kindly rate the average stock performance of your bank for the last five years. Use a scale of 1-5, where 5 = Very high 4. High 3. Moderate 2. Low 1. Very low.

	1	2	3	4	5
Stock performance					

Anything else you would like to comment on the stock returns of your bank?

.....

SECTION II: CREDIT RISK:

Objective 1: To examine the influence of credit risk on stock returns of commercial banks listed in Nairobi Securities Exchange.

Please indicate the extent to which the following indicators increase credit risk in your bank.

Indicators of Credit Risk	Very Low	Low	Moderate	High	Very High
Lack of clear structure and responsibilities of credit risk committees					
Increasing level of non-performing loans					
Increasing level of loan loss provisions					
Lack of policies and procedures on insider lending					
High level of non-performing loans is unsecured					

Anything else you would like to comment on credit risk at your bank for the last five years.

.....

.....

SECTION III: MARKET RISK

Objective 2: To establish the influence of market risk on stock returns of commercial banks listed in Nairobi Securities Exchange.

Please indicate the extent to which the following factors increase market risk in your bank.

Indicator of Market Risk	Very Low	Low	Moderate	High	Very High
Over 20% of deposit base in many occasions is in foreign currencies					
Over 20% of loans are mostly funded by borrowed funds.					
Over 20% consolidated bank profit is from subsidiaries operating outside the country.					
The bank lack expertise to hedge the depreciation of KSH against the USD on asset and liability exposures					
Failure to conduct Stress test and therefore effects of market risk on the balance sheet are rarely detected.					

Anything else you would like to comment on the market risk in bank for the previous five years.....

SECTION IV: LIQUIDITY RISK

Objective 3: To analyze the influence of liquidity risk on stock returns of commercial banks listed in Nairobi Securities Exchange.

Please indicate the extent to which the following measures increase liquidity risk in your bank.

Indicators of Liquidity Risk	Very Low	Low	Moderate	High	Very High
Failure by Asset and Liability Committee to coordinate, plan and communicate on balance sheet liquidity items.					
Loans to deposit ratio mostly exceeds 60%					
Failure to keep liquid assets to match cash flow requirements					
Lack of time frame to review liquidity limits and positions in line with risk tolerance.					
The proportion of liquid assets to total deposits decreases mostly to less than 20%					

Anything else you would like to comment on the liquidity risk of your bank for the last five years

SECTION V: CAPITAL RISK

Objective 5: To assess the influence of capital risk on stock returns of commercial banks listed in Nairobi Securities Exchange.

Please indicate the extent to which the following measures increase capital risk in your bank.

Indicators Capital Risk	Very Low	Low	Moderate	High	Very High
Failure to match capital adequacy with bank risk appetite.					
Decreasing ratio of shareholders' funds to total assets					
Decreasing ratio of core capital to weighted assets					
Non-compliance to CBK prudential guidelines on capital adequacy					
Failure to provide for risk capital to cater for unforeseen probable losses.					

Anything else you would like to comment on the capital risk of your bank for the last five years.....

SECTION VI: BANK SIZE

Objective 5: To investigate the moderating effect of bank size on the influence of financial risk on stock returns of commercial banks listed in the Nairobi Securities Exchange.

Please indicate how well the following indicators determine the magnitude of bank size in your organization.

Indicators of Bank Size	Very High	High	Moderate	Low	Very Low
Asset base					
Capital size					
market capitalization					
Revenue size					
Customer base					

Anything else you would like to comment on the strength of bank size in your organization for the last five years.....

SECTION VII: STOCK RETURNS

Please indicate the extent to which the following indicators increase stock returns in your organization? Please indicate tick accordingly

Indicators of Shareholder Value	Very High	High	Moderate	Low	Very Low
Earnings per share					
Dividend per share					
Capital gains					
Economic growth rate					
Retained Earnings and Reserves					

Anything else you would like to comment on the stock returns of your bank for the last five years.....

Thank you for your cooperation.

Appendix II: Introductory Letter

Isaac Gicang'iru Mwaurah
School of Human Resource Development
Jomo Kenyatta University of Agriculture and Technology
Nairobi.

Dear Sir/Madam,

I am a Finance Doctoral scholar in the stated university undertaking a study on the influence of financial risk on stock returns. I am glad to inform you that you have been selected to form part of the study. I kindly request you for assistance in completing the attached questionnaire which forms as a major input of my research process. The information and data will be used strictly for academic purposes only and strict confidence shall be observed on the same.

Your cooperation will go a long way in ensuring success of this study.

Thank you in advance for your time.

Yours Sincerely,

Isaac Gicang'iru Mwaurah
PhD candidate, Jomo Kenyatta University of Agriculture and Technology

Appendix III: List of Listed Banks as at 2015

No	BANK	TIER
1	Barclays Bank of Kenya Ltd Ord 0.50	I
2	CFC Stanbic of Kenya Holdings Ltd ord.5.00	I
3	Diamond Trust Bank Kenya Ltd Ord 4.00	II
4	Equity Bank Ltd Ord 0.50	I
5	Housing Finance Co.Kenya Ltd Ord 5.00	II
6	Kenya Commercial Bank Ltd Ord 1.00	I
7	National Bank of Kenya Ltd Ord 5.00	II
8	NIC Bank Ltd Ord 5.00	1
9	Standard Chartered Bank Kenya Ltd Ord 5.00	1
10	The Co-operative Bank of Kenya Ltd Ord 1.00	1
11	I & M Holdings ord 5.00	II

Appendix IV: Listed Banks Dividend and Stock Price Data

LISTED BANKS ANNUAL DIVIDEND DATA

YEAR	YEAR	EQTY	KCB	DTK	CFC	NBK	NIC	BBK	HFCK	SCBK
2005	DIV/SHARE									
2006	DIV/SHARE	2	1	1	2.5	0	0.53	4.2	0	8.5
2007	DIV/SHARE	2	1	1.3	2	0	1.05	3	0.25	10
2008	DIV/SHARE	3	1	1.4	1.2	0	1.05	2.5	0.3	10
2009	DIV/SHARE	0.4	1	1.55	0	0	0.5	4.7	0.5	12
2010	DIV/SHARE	0.8	1.25	1.6	0	0	0.5	0.5	0.7	13.5
2011	DIV/SHARE	1	1.85	1.7	0	0.4	0.5	1.5	1.2	11
2012	DIV/SHARE	1.25	1.9	1.9	0.73	0.2	1	1	1.4	12.5
2013	DIV/SHARE	1.5	2	2.1	2.15	0.33	0.75	0.7	1.75	14.5
2014	DIV/SHARE	1.8	2	2.4	5.2	0	1	1	1.5	17
2015	DIV/SHARE	2	2	2.5	5.4	0	1	1	1.3	17

LISTED BANKS STOCK PRICE DATA

YEAR	YEAR	EQTY	KCB	DTK	CFC	NBK	NIC	BBK	HFCK	SCBK
2005	DEC	130	117	40	75	34	53	285	16	143
2006	DEC	135	218	71	88	56	98	74	40	207
2007	DEC	142	27	92	128	45	104	77	40	204
2008	DEC	165	22	66	61	41	42	50	16	154
2009	DEC	14	20	69	47	38	29	44	17	156
2010	DEC	26	22	131	74	39	48	59	25	250
2011	DEC	17	16	90	40	19	24	12	13	162
2012	DEC	24	29	111	40	17	38	15	15	235
2013	DEC	33	45	193	84	27	61	18	32	301
2014	DEC	50	57	237	124	25	60	17	47	336
2015	DEC	41	40	198	85	15	42	13	22	202

Appendix V: Determined Stock Returns Data

ANNUAL LISTED BANKS STOCK RETURNS: 10 YEARS

YEAR/ BANKS	EQTY, R(i,t)	KCB, R(i,t)	DTK, R(i,t)	CFC, R(i,t)	NBK, R(i,t)	NIC, R(i,t)	BBK, R(i,t)	HFCK, R(i,t)	SCBK, R(i,t)	AV
2005										
2006	0.0524	0.6269	0.5808	0.1823	0.4990	0.6201	-1.2996	0.9163	0.4101	0.2876
2007	0.0645	0.2387	0.2748	0.3959	-0.2299	0.0695	0.0785	0.0124	0.0333	0.1042
2008	0.1681	-0.1495	-0.3057	0.0702	-0.0942	-0.1389	-0.3813	-0.9009	-0.2183	-0.2167
2009	0.4149	-0.0460	0.0596	-0.2554	-0.0770	-0.3473	-0.0162	0.0979	0.0870	-0.0092
2010	0.6616	0.1273	0.6605	0.4486	0.0328	0.5194	0.2961	0.4016	0.5242	0.4080
2011	-0.3525	-0.2260	-0.3621	-0.6215	-0.6919	-0.6880	-1.4786	-0.5727	-0.3682	-0.5957
2012	0.3697	0.6736	0.2323	0.0305	-0.0995	0.5024	0.2697	0.2671	0.4238	0.2966
2013	0.3767	0.5055	0.5640	0.7552	0.4748	0.4790	0.2197	0.7664	0.2946	0.4929
2014	0.4585	0.2653	0.2154	0.4365	-0.0670	0.0000	0.0028	0.4212	0.1594	0.2102
2015	-0.1625	-0.3054	-0.1672	-0.3216	-0.5075	-0.3331	-0.1597	-0.7127	-0.4280	-0.3442


Appendix VI: Listed Banks Aggregate Secondary Data Sheet


YEAR/ VARIABLES	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Dependent Variable										
Stock Returns – R (i, t)	0.2876	0.1042	-0.2167	-0.0092	0.4080	-0.5957	0.2966	0.4929	0.2102	-0.3442
Independent Variable										
Credit Risk										
Non-performing/Gross loans - NLG (i, t)	0.141	0.076	0.0695	0.0673	0.0527	0.0367	0.0375	0.0427	0.0465	0.0702
Loss-Provisions /Gross loans- LLG (i, t)	0.1669	0.0712	0.0568	0.0477	0.0413	0.0314	0.0293	0.0294	0.0312	0.0342
Market Risk										
% change in 91days treasury Bills - IR (i, t)	0.0212	0.1814	0.2234	-0.2307	-1.0957	2.0827	-0.7907	0.1371	-0.104	0.1340
%change in Exchange Rates-Kes/USD - FR (i, t)	-0.0813	-0.0933	0.2074	-0.0340	0.0659	0.0729	-0.0078	0.0037	0.0468	0.1221
Liquidity Risk										
Loans/Deposit Ratio - LDR (i, t)	0.7591	0.7071	0.7105	0.6872	0.692	0.7522	0.7478	0.7735	0.7401	0.833
Liquid Assets/Total Deposit - LAA (i, t)	0.4251	0.3695	0.3362	0.4176	0.4318	0.3722	0.4403	0.4255	0.4256	0.4083
Capital Risk										
Core Capital/Total Risk Weighted Assets - CWA (i, t)	0.1462	0.1307	0.1421	0.1553	0.1548	0.1563	0.1615	0.1526	0.1381	0.1433
Shareholders' funds/Total Assets - ETA (i, t)	0.128	0.1362	0.1389	0.1439	0.1376	0.1441	0.1559	0.1599	0.1568	0.1518
Moderating variable										
BankSize: Risk weighted Assets (Log) - ZS (i, t)	13.4810	13.7400	14.0052	14.1398	14.3834	14.5190	14.6620	14.8100	14.9782	15.1061

Appendix VII: Research Permit

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 Officer will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, fitting 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


National Commission for Science,
Technology and Innovation
**RESEARCH CLEARANCE
PERMIT**


Serial No. A/12726
CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MR. ISAAC GICANGIRU MWAURAH
of JOMO KENYATTA UNIVERSITY OF
AGRICULTURE & TECHNOLOGY, 0-20117
NAIVASHA, has been permitted to
conduct research in *Nairobi County*

Permit No : NACOSTI/P/17/62655/15635
Date Of Issue : 13th February, 2017
Fee Received : Ksh 2000

on the topic: **INFLUENCE OF FINANCIAL
RISK ON SHAREHOLDER MARKET VALUE
OF COMMERCIAL BANKS LISTED AT
NAIROBI SECURITIES EXCHANGE**

for the period ending:
11th February, 2018


.....
Applicant's
Signature




.....
Director General
National Commission for Science,
Technology & Innovation