ANALYSIS OF INTEREST RATES, HEDGING AND NON-INTEREST INCOME ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS LISTED AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION AND APPROVAL

This thesis is my original work and has not been presented for an award of a degree or diploma in any other University or Institution of Higher learning.

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ABSTRACT

Kenya Banking system manifest in a controlled and fragmented financial system attributed to differences in regulations governing banking and non-banking financial intermediaries. However, inadequate autonomy and weak supervisory capacities has led to the number of non - performing loans increasing overtime from 22% to 27.3% of the total loans. It is not clear the extent to which this trend was linked to interest rates, hedging, non-interest income and financial performance of commercial banks. Further, past studies findings have produced mixed results where some indicated positive significant relationship between non-interest income and financial performance while other studies showed insignificant relationship. The purpose of this study was to assess the effects of interest rate, hedging, non-interest income and financial Performance of commercial banks listed at the Nairobi Securities Exchange. The study specific objectives were: to establish the effect of Central Bank Rate (CBR) on the relationship between bank commissions on loans income and financial performance of commercial banks ;to find out the effect of interbank rates on the relationship between transactions account income and financial performance of commercial banks ;to establish the effect of Repo rates on the relationship between investment income and financial performance of commercial banks ; and determine the effect of hedging on the relationship between interest rates, non -interest income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The data was collected in November 2023. The study was directed by the loanable fund theory, liquidity preference theory and the time preference theory. The conceptual framework directed the relationship between the variables as conceptualized in this study. The study adopted a cross-sectional survey research design with panel data analysis approach. The study unit of analysis was the Commercial Banks listed in Nairobi Securities Exchange. According to the NSE Report (2019), a total of 11 commercial banks are listed. The study adopted a census where all the banks were considered. Secondary data which was collected from both individual banks financial statements and the Central Bank's database using a data collection guide. Correlation analysis and regression analysis was used to explain the relationship between interest rate, non-interest income and financial performance of listed commercial banks at 95% confidence level. Findings include: results reveal that CBK rates and hedging when optimized the financial performance of commercial banks improves significantly ($R = .734^a$, R^2=.539, adjusted R^2= .533, p= 0.000<.05); a strong and positive association existed between the Interbank Rate-Hedging, Transaction Account Income and financial Performance ($R = .849^a$, R^2=.720, adjusted R^2=. 717, F = 215.252, p= 0.000<.05); a strong and positive association existed between repo rate-hedging, investment income and financial performance of commercial banks ($R = .776^a$, R^2=.602, adjusted R^2=.600, F = 99.639, p= 0.000<.05). Further a strong and positive association existed between interest rates, hedging, non-interest income and financial performance of commercial banks. Therefore, variation in financial performance of banks can be explained up to 89.8% by interest rates, hedging, non-interest income interaction. These variables can be relied up 88.9% in the precise prediction of financial performance of commercial banks listed at NSE ($R = .947^a$, $R^2 = 0.898$, adjusted $R^2 = 0.889$, p .000< .05, F = 109.734). The study recommends that commercial banks should maximize use of interest rates, non-interest incomes and hedging to maximize their financial performance. The findings of this study are of value to various parties which include: the government and other policy makers and regulators, the management of commercial banks and other financial institutions, investors and the existing literature.

DEDICATION

I dedicate this research thesis to my family Winnie Lazaro, Awuor Sheila, Sue Lazaro, Wenwa Apiyo, Eng. James Kiche, Ann Arogo and John Steve Adhu not forgetting may Late Dad John Adhu and my Late Mum Susana Onyango and My step Mother who brought me up Eunice Ogolla Adhu. The team created a favourable environment for the advancement I have had in my studies upto this level. I will forever be grateful to them.

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ABBREVIATIONS AND ACRONYMS

CBK- Central Bank of Kenya

CBR- Central Bank Rates

EGARCH- Exponential Generalized Autoregressive Conditional Heteroskedasticity

Repo- Repurchase agreement

MPC- monetary policy committee

OECD - Organization for Economic Co-operation and Development

TB- Treasury Bill

ROA -Return on Assets

VAR- value at risk

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The banking sector is an integral part of the economy and is one of its major drivers. The banking sector is among the sectors under the financial services that is expected to contribute greatly to the realization of Kenya`s Vision 2030 (Republic of Kenya, 2007). An efficient banking sector contributes positively to economic development by promoting capital accumulation through supply of credit. The sector mobilizes and allocates savings, supports trade, helps in diversification and hedging of risk, and contributes to overall economic growth of a country through provision of credit to the private sector (Levin, 1997). For this sector to continue providing these services, it must be stable and be able to make profits from their operations. Besides, the commercial banks are the major transmitters of monetary policies implemented by the Central Bank in the economy (Siddiqui and Shoaib, 2011). With these roles, analyzing the determinants of their profitability is essential and important to the growth of this sector and stability of the economy.

Commercial banks ease transactions carried out by economic agents by providing finance to spur economic growth and development (Horvath, Seidler, & Weill, 2014). Banks perform valuable activities as they enhance the flow of funds between surplus and deficit units and facilitate payments and settlement systems supporting the smooth transfer of goods and services (Diamond & Rajan, 2001). In addition, banks ensure productive investment of capital to stimulate economic growth and development of new industries, thereby increasing employment and facilitating

economic growth. Thus, banks should hold more liquid assets to help indemnify themselves from potential liquidity problems. (Basel Committee on Banking Supervision, 2013)

Shareholders do not decide the hedging policy adopted by the firm, but managers do. On this basis shareholders choose managerial compensation contracts that maximize the value of the firm. Optimal hedging policies are derived under the assumption of that Managers maximize their expected lifetime utility and that their income from the form is an increasing function of the changes in the value of the firm. Hedging holds that there exist no loss in generality if it is assumed that trading takes place in investments of instantaneous maturity and interest rates parity holds; the managers are indifferent between investments whose returns are perfectly correlated with changes in exchange rate(Jansen and Meckling,2020).

In any economy, banks act as intermediaries in that they serve as means through which people keep money when they are not spending or investing it and also enables those who don't have money available to them at the time but want to spend or invest to borrow loans (Kanagaretnam, Lobo & Mathieu, 2003). Thus, banks make their money out of the difference between the rates at which they pay the depositors and the rate they charge borrowers which is also referred to as interest rate spread. In a free market without government intervention on interest rates, the rates are determined by market forces, such as demand and supply (Oduor, 2016). But in an economy where the government sets policies to control the rates such as in the USA, Germany and France and lately Kenya, the rates are determined by the law. Governments use different policies in their move to eliminate high interest rate volatility: for instance, putting a ceiling on the rates, changing the Central Bank Rates (CBK), setting the interbank and Repurchase agreement (Repo) rates. The government chooses the approaches depending on its monetary policy, variants of inflation economy and the stage of the economy in relation to the global economy.

In recent years, the global banking business has experienced substantial shifts in technology, the competitive landscape, client demands, and governmental fiscal policies. These are the causes for the continual evolution of nontraditional goods and services. Since then, in addition to income from traditional activities such as loan activities, non-traditional businesses such as service fees, commissions, and trading securities have provided commercial banks with non-interest income. Numerous studies have examined the relationship between non-interest revenue and the performance of commercial banks to determine whether this type of income diversification aids in the growth of commercial banks. Numerous studies have examined how non-interest income affects the profitability of commercial banks. The association between non-interest revenue and the performance of banks has not, however, been established with consistency in prior studies. Theoretically, raising the non-interest income ratio through income diversification has produced more consistent operational income for banks, hence enhancing their performance (Chiorazzo et al. 2008; Nguyen et al. 2018). Both Meslier et al. (2014) and Pennathur et al. (2012) imply that increasing non-interest income results in improved bank performance, particularly for large banks. Recent empirical studies, however, do not fully support this viewpoint, such as Jaffar et al. (2014), Lee et al. (2014), Maudos (2017), Senyo et al. (2015), Sun et al. (2017), and Williams (2016), who all contend that non-interest income increases commercial banks' exposure to risk. In addition, these studies demonstrate that non-interest activities make it challenging for banks to raise their revenues.

The increasing importance of non-interest income (NII), particularly in recent years, has stimulated research on the factors which have underpinned its performance (DeYoung and Rice, 2004). International evidence has shown that bank characteristics as well as environmental factors such as deregulation, globalization, and investment in technology and developments in

the financial architecture have played a significant part in explaining trends in NII. Study by Caribbean, Craigwell and Maxwell (2005) showed that ATM technology and bank-specific characteristics were the main factors influencing the performance in non-interest income of banks. Where the bank-specific features including the composition of the loan portfolio as well as the degree of personal service offered by the banking institution influence the performance.

In a country's economy, the rate of interest play a very crucial role especially in determining the trend with which the funds are channeled (Johnson, 2005). With the recognition of the importance of interest rates in an economy, various governments have been reluctant to allow market forces of supply and demand to determine the rate of interest in their economies and as such they have used various mechanisms to control and manipulate the prevailing rates either directly or indirectly (Emeka et. al, 2015). The governments opt to use policies and approaches such as setting the rate ceiling, using guided regulations, using Repo, manipulating the CBRs and sometime deregulations and financial liberalization. The choices made by governments on interest rate policies and approaches are mainly dependent on the country's monetary policy, variants of inflation economy and the stage of the economy in relation to the global economy (Gale, 2008).

In Kenya, it is the monetary policy committee (MPC) of the Central Bank of Kenya that makes decisions concerning interest rates. Since August 2005, Central Bank Rate (CBR) has been the official interest rate after it replaced the 91-day Treasury Bill (TB) rate. The policy to cap interest rate in Kenya was established in August 2016 to protect the consumers from unfair interest rates that had risen to as high as 23 percent (Kiema, 2016). This issue has been at the center of discussions recently in political, economic and even social phenomenon, with some people for instance politicians and businessmen advocating for policy to cap interest while the

banking fraternity suggesting that the high rates are over time be corrected by the market itself (Theuri, 2015). Other authors even suggest that the interest rate capping policy in Kenya is expected to slow down the performance of commercial banks which will make them lay off some staffs to cut costs (Kubwa, 2016). Risk management gained more focus after the 2007/2008 global financial crisis in which banks, stock markets and large financial institutions collapsed which triggered the governments to recognize the impact of ineffective risk management in their financial systems and this led to enactment of risk control mechanisms. This resulted to the introduction of BASEL Norms by the Bank of International Settlements Committee. These norms focus on operational, credit and liquidity aspects which help banks to quantify their risks and apply their risk management practices (Vaidyula & Kavala, 2013). In the aftermath of the crisis, banks had not fully appreciated the importance of liquidity risk management and the implications of such risk for the banks and the financial systems. Thus, policy makers recommended banks to hold more liquid assets than in the past, to help self-insure against potential funding difficulties. This led to an international desire for common measures and standards for liquidity risk (Basel Committee on Banking Supervision, 2013).

Different scholars define interest rates differently for instance; Ibimodo (2005) defines it as the cost of borrowing credit or the return by lenders for parting in liquidity. Keynes defines interest rates as the compensation for parting with liquidity for a given period but not hoarding. However, this definition is criticized for giving lending rate more attention. Interest rate is also the rate at which production gap is zero while inflation is constant (Bernhardsen, 2008). Interest rate is also the yield on equity (Adebiyi, 2002). The loanable funds theory on the other hand define the interest rate as the price paid for credit which just like other prices in the market, is determined by the forces of supply and demand but in this case the supply and demand of

loanable funds (Ohlin, 1937). Examples of interest rate are, lending rate, discount rate and saving rate (Adebiyi, 2002) as cited by Makinde (2016). According to Corb (2012), the major reason for controlling the interest rates charged on financial instruments in Kenya is centered on the need to control economic patterns by the Central Bank of Kenya (CBK) through the interest rates which have a great effect on the economic performance.

Interest rate policy is a major monetary policy instrument which plays a crucial role in financial resource mobilization for economic growth and development (Ojima & Emerenini, 2015). There are a number of interest rate policies that governments can use to control interest rates in an economy for the instance the use of interest rate capping policy, using the central bank rate policy or the Repo rates policy or through the interbank rates policy. The interest rate capping policy involves setting a ceiling on the country's interest rates by the authority to reduce the chances that financial institutions will earn unfair profits (Mbegue, 2013). According to the World Bank report (2015), by 2014, 74 countries had capped their interest rates among them the USA, Germany and France. Flexible interest rate policies on the other hand are found to bring problems such as interest rate volatilities that are more than acceptable (CBN 2006). A study by Enyioko (2012) on the impact of interest rate policy adopted on the performance by Nigerian deposit taking banks had established that the interest rate policy adopted in Nigeria has had no impact on the overall performances of banks but had slightly affected the growth of the Nigerian economy.

Al-Tamimi (2008) study on the Basel II Accord found that banks are aware of the benefits, impact and challenges associated with the implementation of the accord. This accord is associated with adequate application of Risk management practices in the banking sector to make them sound in their liquidity to avoid financial distress and financial crisis at large in this

sector. Prudent liquidity risk management includes maintaining sufficient cash and marketable securities, and the availability of funding from an adequate amount of committed credit facilities (CBK report, 2016).). In banking theory and practice, there are no commonly accepted indicators measuring the liquidity of banks (Mehmed, 2014). However, deposits, cash reserves, non-performing loans and bank size can be used as liquidity indicators. This liquidity indicators are measures that banks use to mitigate risks, risk measurement metrics oscillates around the volume of deposits, volume of cash reserves and level of default rate of bank loans to customers. Hedging techniques helps to maintain banks performance by minimizing financial loses. The modeling of interest rates is anchored on the focus to maintain banks performance through control of its loan portfolios to customers both the household and firms that are either deficit units or surplus units in need of capital for investment.

In Kenya, the changes in the banking industry came with the introduction of new interest policies in 2003 by the NARC government (Nduati, 2013). The policies involved a reduction of the rates on the loans given to the banks by the government. Although the top tier banks were subjected to crises, small banks and other micro finance institution enjoyed a good business environment and expanded. The policy was the government's move to expand the small banks and micro finance institutions and enhance their performance (Ndung`u, 2000). More recently in August 2016, the government implemented the interest rate capping policy which set the rates at 4% above the base rate and of 70% of the base rate to be paid to savers. This was a move aimed to reduce the high interest rates of up to 23% that were being enjoyed by banks and other financial institutions.

The Kenya's banking industry was liberalized in the late 1995 with the CBK as the regulator having the authority to formulate and oversee implementation of policies that govern the industry. The banking industry is governed by policies and regulations that include; the Central

bank of Kenya Act, the banking Act and the companies Act among other guidelines that the Central Bank of Kenya (CBK) issued (Mwende, 2015). The industry comprises of 48 institutions of which 44 are commercial banks and the remaining 3 are mortgage finance companies (CBK Annual Reports, 2015). Out of the 48 institutions 35 are locally owned and out of the 44 commercial banks 31 are domestically owned and 13 are foreign owned (CBK Annual Reports, 2015). Kenya Bankers Association (KBA) is a body that was set up to lobby for local banking industry and also act as a platform to address issues affecting the sector (Mwende, 2015).

A review of the banking industry in Kenyan leaves many questions about the credibility of the industry's corporate governance structures and overall soundness (MacPherson, 2014). There has been turbulence since 2015 that saw three mid-sized banks placed under receivership including Dubai Bank, Imperial Bank and the most recent case of Chase Bank. This suggests a possible existence of challenges in the banking sector which others attribute to weak supervision, questionable governance practices and widespread fraudulent activities in the sector (MacPherson, 2014). The CBK has however been quick to express optimism just to reassure confidence in the public through describing the events as isolated and not contagious while declaring to the public that the country's banking sector is not suffering from efficiency problems (MacPherson, 2014). The literature has not established whether the financial challenges in the banking industry have resulted from the changes in interest rates policy or not which brings a gap in knowledge.

The Kenyan government realized that banks were not able to regulate themselves despite the fact that the Monetary Policy Committee was in place then it became necessary to cap the rates at 4% above the CBR not only to protect the consumers but also for the development of the country. This has been faced with strong resistance from parties such as Kenya Bankers Association. The

commercial banks have since used various means to cope with the new rates in the Kenyan business environment. These include, lending to less risky borrowers such as the government, cutting back expenses, laying off workers (Kamulegeya, 2016), embracing new technology, outsource some services if it is cheaper, optimizing the performance and utilization of staff, increasing the cost of loans and commissions and innovating.

The move for interest rate policy changes has brought out different reactions. This has seen support by politicians and businessmen and also a strong opposing force from different participants in the economy for instance the CBK and a very hostile response from the banks especially the Kenya Bankers Association (Oduor, 2016). Some researchers such as Jelilov and Maiga (2015) have come out to suggest that this policy change will help enhance economic performance through increasing economic activities, while other researchers such as Theuri (2015) suggests that although the policy changes is done with a noble objective, the country may end up with very adverse effects on the economy. Kubwa (2016) opines that with the enacted policy in place, it is expected that more banks will continue to perform activities such as staff layoffs to reduce their costs.

Asset liability management of commercial banks is pro foundation for product innovation, diversification and efficiency of the institutions (Hempell, 2002). The stability of commercial banks as whole in the economy depend on proper asset liability management structures. Better asset liability management have the tendency to absorb risks and shocks that commercial banks can face. Moreover, asset liability management is the prerequisite condition for the efficiency and growth of commercial banks. Asset liability management in commercial banks is determined by the ability of the banks to retain capital, absorb loan losses, support future growth of assets and provide return to investors. The largest source of income to the bank is interest income from

lending activity less interest paid on deposits and debt. For a bank to attain the same objectives then it has to ensure proper asset liability management, including liquidity risk management, interest rate risk management and credit risk management (Francis, 2007).

Hou and Dickinson (2007), non-performing loans are those loans that are not earning income and full payment of principal and interest is no longer anticipated, Principal or interest is ninety days or more delinquent or the maturity date has passed and payment in full has not been made. Non-performing loans are also described as loans in arrears for at least ninety days (Guy, 2011). Therefore in this study, non- performing loans are loans that are ninety or more days delinquent in payments of interest or principal (Bexley & Nenninger, 2012). Non-performing loans are closely associated with banking crises (Waweru & Kalami, 2009). Moreover, non-performing loans were considered one of the main causes of the 2007-2009 global financial crisis which damaged the USA economy and economies of many countries (Adebola, Yusoff, & Dahalan, 2011). Therefore, there is need to devise mechanisms to control the non-performing loan levels to avert the possibility of a breakdown in the financial system. Among the mechanisms to control non-performing loans is the modeling of interest rates and as a hedging strategy. But it is unclear how interest rate modeling moderates the relationship between Non interest income items and financial performance of the banks.

The techniques of managing assets and liabilities together came into being as a strategic response for commercial banks to high inflationary pressure, volatility in interest rates and severe recessionary trends which marked the global economy in the 1970's and 1980's (Lich, 2000). According to Schepper, Goovaerts and Decamps (2009), Asset Liability Management concept has gained importance in Africa continent in the wake of the ongoing financial sector reforms, particularly relating to interest rate risk, liquidity risk and credit risk management deregulation.

Financial distress has afflicted numerous commercial banks, many of which have been closed down by the regulatory authorities or have been restructured under their supervision. The recent rise in non-performing loans is widely spread across commercial banks in Kenya and is evident in both public and private owned banks. The upward trend of non-performing loans started immediately with the outbreak of the financial crisis in 2008, but the sharp increase occurred two years later. In 2010 the non-performing loan rate increased from 18.5% to 20.5%. The rate also increased to 22.5% in 2012 and 25.7% in 2013. The upward trend reflects in part the consequences of heightened unemployment in Kenya which, together with depreciated currency and tight financial conditions, weakened the borrowers' repayment capacity.

According to Briys and Varenne, (2010) Lehman Brothers which was the fourth-largest investment bank in the United States and was considered one of Wall Street's biggest dealers in fixed-interest trading and heavily invested in securities linked to the US sub-prime mortgage market collapsed. In Nigeria, the problem of asset liability management has been observed as far back as 1930s. According to Kargi (2011) between 1930 and 1958, over 21 bank failures were recorded in the Nigerian banking sector. The banking failures during that era may have been caused by in appropriate techniques on asset liability management. This was further recorded in the 1990s and in the early parts of the 2000s. The non-interest income creates revenue ensuring profitability of banks in the event of a default on interest rate income. Noninterest income from services and penalty charges, asset sales and leasing of property are not affected by economic and financial market cycles; neither are they controlled by interest rate laws and regulations. Noninterest income is among the significant factors influencing bank profitability, (Oniang'o, 2015).

In the past banks have been earning noninterest incomes through providing traditional banking services such as checking accounts, trust, investment in government bonds and cash management. Recently, they have been earning noninterest income from new sources which can be highly traced to securitization of the mortgages, credit cards, agency banking, mobile and internet banking, insurance underwriting, and mutual funds investment. According to Ng'endo (2012), the advancement towards noninterest income investments by commercial banks has resulted in increased competition in financial market integration, technological advancement, and improved regulations in the banking industry.

Bank deposits provide a natural hedge to banks against liquidity risk as they come handy in assisting the bank to meet unexpected cash demands from depositors and lenders (Gatev and Strahan, 2003). According to Kazi (2012), deposit mobilization in the banking sector, is intended to encourage customers to deposit more cash with the bank to empower the bank to lend more loans and generate additional revenue in terms of interest and dividends to the shareholders. The main business for banks is accepting deposits and granting of loans. The more they lend, the more profitable they become. Banks do not have a lot of their own money to give as loans, they depend on customers deposits to generate funds for granting loans to other customers. Commercial banks that have a large asset size are able to expand their operations geographically to regions where competition is not very high or to regions where the market is largely untapped. Such a move would increase the customer base of the bank in a significant manner and this would also lead to increased customer deposits (Goddard, Molyneux & Wilson, 2004). The hedging strategies adopted by most banks increase of customer deposits is considered of importance for it can be used to generate more liquid assets to the bank; but it is unclear on the

extent to which this component of hedging moderates the relationship between interest rate models, non-interest income and financial performance of banks.

Commercial banks in Kenya have lost the ability to determine the interest rates they levy on loans and other intermediation services hence losing the ability to determine the interest income. In August 2016 there was a change in the interest rate regime through a parliamentary legislation that involved capping the interest rates at 4% above the CBR (currently at 10%) and of 7 % of the CBR to be paid to savers, banking (Amendment) Act, 2016. The effect of the banking (Amendment) Act, 2016 has seen several banks issue profit warning followed by a drop in their profitability. The reduction of the interest spread has seen significant reduction in the interest income, (Anyanzwa, 2017). Ng'endo (2012), Mboya (2012), and Gichure (2015) looked into the relationship between non-interest income, earnings volatility and financial performance of banks in Kenya and concluded that noninterest income results in earnings volatility because of the required expansion in fixed costs. They also noted that there are few benefits if any to be expected from income diversification from traditional banking to fee-based revenue despite growing importance of non-interest income. Murithi (2013) and Oniang'o (2015), reviewed the effects of revenue diversification into non-interest income on financial performance of banks in Kenya and found out that noninterest income affects performance of commercial banks to a great extent because revenue diversification is associated with greater returns and greater earnings volatility.

These studies indicate the topic of noninterest income and how it affects performance of banks is not conclusive and has produced mixed results. Divergent conclusions from different scholars suggest that the subject is a contemporary issue more so to a developing economy like Kenya.

These studies have all added to the knowledge gap in the area but have not been exhaustive. Most of these studies have been generalizations on the subject or have been undertaken together with other variables. Unlike them this study sought to break noninterest income into its specific sources and determine to what extent each source influenced performance. Secondly, when these studies were undertaken banks had not totally delved into income diversification because they had interest income as a fall back. Many of the new noninterest income sources like insurance underwriting, income from agency banking, mobile banking, online banking and investment advisory had not taken root in most banks. Presently most banks have embraced these fees-based incomes from these new sources and their cumulative impact on performance has been inadequately determined. Thirdly when these studies were done, the law capping interest rates in August 20016 had not come into effect. The law has had a significant impact on performance of banks because it has limited commercial banks' ability to charge interest income. As such banks have diversified significantly in order to stabilize profitability and earnings volatility.

Weakness in Kenya Banking system is becoming apparent and is manifesting in the relative controlled and fragmented financial system in Kenya. This can be attributed to differences in regulations governing banking and non-banking financial intermediaries, lack of autonomy and weak supervisory capacities carried out by the central banks surveillance in enforcing banking regulations. The number of Non -Performing Loans is increasing overtime from 22% to 27.3% of the Total Loans. This can be attributed to non-compliance by the banks as per the Central Bank of Kenya regulations. Further, the level of credit risk is increasing overtime; moreover, it is observed that 20% of banks have collapsed including Charter House Bank, Trust Bank in the early 2000's and 10% of banks in Kenya merged an example is CFC Stanbic and the trend is still increasing.

The financial health of the banking industry is an important prerequisite for economic stability and growth. As a consequence, the assessment of banks financial conditions is a fundamental goal for many stakeholders. The cost of bank failure is colossal and hence ailing banks require quick action by supervisory authority to salvage them before they collapse (Cheserek, 2007). There are various causes of financial distress but Brownbridge (1998) attributed financial distress to insider lending, lending to high risk borrowers, macroeconomic instability, liquidity support and prudential regulation unlike Babalola (2009) who attributes bank distress to a chain of causation from non-panic related, observable, exogenous adverse changes in the economic conditions of banks, to intrinsic weakening of bank condition, ultimately leading to bank failure. Managerial incompetence is the most common reason for a company's distress and possible failure according to Aasen (2011) but the ultimate cause of failure is often simply running out of cash and other liquid funds.

Financial performance is used to track and review a firm's progress against its strategic plan and goals. According to DeYoung and Rice (2004), most commercial banks earn substantial amounts of non-interest income by charging their customers fees in exchange for a variety of financial services. Many of these financial services are traditional banking services, transaction services like checking and cash management, safe-keeping services like insured deposit accounts and safety deposit boxes, investment services like trust accounts and long-run certificates of deposit (CDs), and insurance services like annuity 4 contracts. In other traditional areas of banking such as consumer lending and retail payments the widespread application of new financial processes and pricing methods is generating increased amounts of fee income for many banks.

DeYoung and Rice (2004) noted that in recent years, banking companies have taken advantage of deregulation to generate substantial amounts of non-interest income from nontraditional

activities like investment banking, securities brokerage, insurance agency and underwriting, and mutual fund sales. However, the interest margin banks earn by intermediating between depositors and borrowers continues to be the primary source of profits for most commercial banks. Profit is the ultimate goal of commercial banks but they also have other social and economic goals. There are various ways to measure the profitability of a bank but according to Ongore and Kusa (2013), profitability of commercial banks is measured using three major ratios. The first ratio is the return on equity ratio which is the amount that banks earn compared to the total amount of shareholders equity invested. A high ROE is favorable for a bank as it shows its ability to generate cash internally. According to Khrawish (2011), it reflects how effectively a bank is using shareholders' funds. The second ratio is the return on asset ratio which is the ratio of income to its total asset and measures the ability of the bank to generate income by utilizing the assets at its disposal. A high ROA shows the bank is efficient in using its resources. The third ratio is the net interest margin ratio which measures the interest income generated by banks and the amount of interest paid out to their lenders. The higher the Non Interest Margin the higher the bank's profitability. However it could also mean riskier lending practices associated with substantial loan loss provisions (Khrawish, 2011).

Commercial banks` performance in Kenya over the last decade has not been impressive. Several reforms have been implemented in the financial sector since 1990s aiming at increasing performance, stability, productivity, financial access and efficiency. However, bank profitability on average has been erratic. In the period 2008- 2020, increases in Profits before Tax (PBT) has been below 20% on average terms. In the year 2022 PBT of the Kenyan commercial banks increased by 16.6% as compared to the year 2021 when PBT increased by 20.6%. This trend is not impressive given that a lot of reforms have been done to enhance performance of the banking

sector. Also there has been a lot of changes in technology and several financial innovations have been developed in Kenya`s financial sector. All these changes have reorganized the banking sector in terms of management, interactions with clients and relationships with other institutions. All these developments affect banks` performance and their total cost of operations.

The methods of inferring the results of previous studies, the p-value of the coefficient in the models are frequently employed in prior studies to draw conclusions regarding the research hypotheses, in this model's utilization of p-values to test a hypothesis have been criticized for decades (Wasserstein and Lazar 2016). This argument is based on the fact that the p-value is a conditional probability that reflects the likelihood that the data occurs if the null hypothesis is found to be true. In other words, the p-value does not provide any information on the probability that the hypothesis would occur. In this study, a number of hypothetical inference approach based on descriptive statistics with superior p-value analysis are adopted demonstrate the probability that the null hypothesis will be true. Although there have been numerous studies on the impact of non-interest income on banks' performance, these studies do not indicate a non-interest income threshold. Therefore, in this study, employs a threshold regression model for panel data which is suggested by Hansen (1999), to identify the thresholds and determine how non-interest income interaction with interest rates and moderated by hedging of risks do influences the performance of commercial banks.

1.2 Statement of the Problem

Previous studies indicate various changes in the interest rates and policies ranging from capping of the interest rates at 4% in 2016 above the base rate and of 70% of the base rate to be paid to savers. The Central Bank of Kenya has overtime persisted on 10% in a move to promote private sector lending and control the government's move to cap the commercial bank rates. The effect

of changes in interest rate and their affect both the short run and long run lending or borrowing in the Commercial banks Sector; this consequently affect the financial performance of commercial banks. Further, Emeka et al. (2015) study established that deregulating interest rates had positive and significant effect on the return on assets (ROA). Makinde (2016) study found that interest rates are negatively related to deposits by commercial banks. Ngure (2014) study established that changes in interest rates affected bank's performance. Moreover, the weaknesses in Banking system is becoming apparent and manifested in a controlled and fragmented financial system particularly in Kenya. The number of Non -Performing Loans in most commercial banks is increasing overtime from 22% to 27.3% of the Total Loans. It is not clear the extent to which this can be attributed to interest rates, hedging and non among commercial banks. Further, the level of credit risk is increasing overtime; as it is observed that 20% of banks have collapsed and 10% of banks in Kenya have been merged for stability and the trend is still increasing as observed in the case of Chase Bank put on receivership and finally bought out. Majority of past studies on interest rates, interest rate policies, non-interest income and financial performance of commercial banks have not exhaustively and conclusively indicated their relationship. From the literature, it is evident that inadequate autonomy and weak supervisory capacities has led to the number of non -performing loans increasing overtime from 22% to 27.3% of the total loans. From the findings, It is not clear the extent to which this trend was linked to interest rates, hedging, non-interest income and financial performance of commercial banks. Further, past studies findings have produced mixed results where some indicated positive significant relationship between non-interest income and financial performance while other studies showed insignificant relationship. All these inadequacies and gaps formed the basis of the main objective of this study which was to assess the effects of interest rate, hedging, non-interest income and financial Performance of

commercial banks listed at the Nairobi Securities Exchange. It is therefore on this basis that this study focused on the analysis of interest rate, non-interest income hedging and financial performance of commercial banks particularly those listed in NSE.

1.3 Objectives of the Study

1.3.1 Main Objective

The main objective of the study was to analyze the influence of interest rates, non- interest income and hedging on the financial performance of commercial banks listed at the Nairobi Securities Exchange.

1.3.1 Specific Objectives

The study specific objectives were;

i. To establish the influence of Central Bank Rate (CBR) and bank commissions on loans as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange.

ii. To establish the influence of interbank rates and transactions account as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange.

iii. To establish the influence of Repo rates and investment income as a non-interest on financial performance of commercial banks listed at the Nairobi Securities Exchange.

iv. To establish the moderating role of hedging on the relationship between interest rates and non -interest income on the financial performance of commercial banks listed at the Nairobi Securities Exchange.

1.4 Research Hypotheses

The following Null Hypotheses were used in the Study**;**

H01. There is no significant influence of Central Bank Rate (CBR) and bank commissions on loans as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange.

H02. There is no significant influence of interbank rates and transactions account as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange.

H03. There is no significant the influence of Repo rates and investment income as a non-interest on financial performance of commercial banks listed at the Nairobi Securities Exchange

H04. There is no significant moderating role of hedging on the relationship between interest rates and non -interest income on the financial performance of commercial banks listed at the Nairobi Securities Exchange

1.5 Significance of the Study

The findings of this study are of value to various parties which include: the government and other policy makers and regulators, the management of commercial banks and other financial institutions, investors and the existing literature. This study findings are further value to the government and other regulators and policy makers through enlightening them on the effect the interest rate policies they make have on the performance of commercial banks thus help them make policies and related models that promote a healthy business environment for commercial banks which in turn enhance the country's economic development. To the management of commercial banks and other financial institutions, this study sheds more light on the effect the interest rate used by the banks on their financial performance thus help them put in place measures that enhances their financial performance. To the investors, the study findings add more information on the effect of interest rate and financial performance of commercial banks for making informed investment decisions. Finally, this study adds information to the future development of this area of knowledge by adding to the existing knowledge, particularly for

studies on the effect of interest rate policies on the performance of commercial banks listed at the Nairobi Securities Exchange.

1.6 Scope of the Study

This study focus was on the effect of interest rate, non-interest income, hedging and financial performance of commercial banks listed at the Nairobi Securities Exchange. This study focused on commercial banks listed at the Nairobi Securities Exchange in Kenya. The study focused on three interest rates that are commonly used in Kenya. These are: the Central Bank Rate (CBR), Interbank Rates and use of Repo rate. The data was collected for the period between 2000 and 2021.

1.7 Justification of the Study

The choice of interest rate, hedging and non-interest income on financial Performance of commercial banks listed at the Nairobi Securities Exchange was motivated by the fact that this service sector is very important to the economy; it makes a substantial contribution to the Gross Domestic Product and National Income. The existing literature reveal mixed results on the effect size of interest rate policies and non-interest income on financial performance of commercial banks; further scanty research has been done on the joint effect of interest rate policies relationship with non-interest income and financial Performance of commercial banks. The improvements in the sector's portfolio mix promote foreign exchange and contribute towards achieving the government objectives like provision of employment opportunities. This study adds knowledge to existing knowledge on interest rate, non-interest income and financial Performance of commercial banks.

1.8 Limitations of the Study

The study was limited by the type of data used due to some commercial banks not listed at the NSE across the study period hence data was collected from the year 2000 to 2021. The limited to adoption robust analysis techniques which helped in the analysis of panel data collected from the commercial banks listed at NSE.

1.9 Assumption of the Study

The assumption of the study was that all the data collected was accurate because the source is reputable financial institutions that follow prudential guidelines.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical framework, the empirical literature and the conceptual framework with regard to the study variables. The concepts and models guiding the study variables descriptions and measurement are discussed.

2.2 Theoretical Framework

Interest rate theories have been put forward by scholars to explain the volatility of interest rate and how the rates affect various institutions in an economy. This study's theoretical review was based on four theories which include; the loanable fund theory, liquidity preference theory, modern portfolio theory and the time preference theory.

2.2.1 Loanable Fund Theory

The Loanable Funds theory was developed by Knut Wicksell (1898) and suggests that it is the supply and demand for loanable funds that determines the level of interest rates. This plays an important role in the investment and saving processes which causes variations in the rates of interest (Wicksell, 1898; Robertson, 1934; Ohlin, 1937). This theory is an improvement of the classical theory of interest rates. The theory is of the opinion that the supply of loanable funds emanate from dishoarding, bank credits and savings while the demand of loanable funds come from three major sources that include; common household consumers, businessmen and the government who demand the funds for consumption, hoarding and investment purposes (Robertson, 1934). This theory is preferred to classical theory because it also considers both real and monetary factors which help acknowledge the role of bank credits as a component of money supply.

This theory further suggests that effective interest rates will be the price which equates the supply of loanable funds to the demand (Ngugi, 2001). It is at equilibrium level where the demand of loanable funds equals supply, where the people and institutions that saves and invests are the happiest. The fluctuations in the interest rates results from changes in the demand or supply for loans or credit funds available for lending. The Loanable fund theory suggests that at equilibrium, borrowers and savers should be well compensated and that the spread in the rates should not be very wide because some parties will feel exploited. According to Emmanuelle (2003), the government should structure the interest rates in a way that every participant will feel contented.

This theory is criticized by Keynes on the account that it is based on an unrealistic assumption of full employment. The theory is also criticized on the grounds that it is indeterminate in that it assumes saving and income are independent but in reality saving depends on income (Hansen, 1941). The theory is also impracticable in the sense that it assumes that saving, hoarding and investment are related to interest rates but in real sense investments are affected by other factors other than the interest rate for instance the marginal efficiency of capital which is ignored by the this theory (Economic Discussion, 2016). This theory is however relevant to this study in that it recognizes money as a determinant of interest rates which in turn determines the performance of commercial banks.

2.2.2 Liquidity Preference Theory

The Liquidity Preference theory originated from the work of John Maynard Keynes (1936). This theory is based on investment, money and employment. Liquidity Preference theory suggests that the interest rates levels in a country is determined by the supply and demand of money. In this theory, interest rates are viewed as a reward for parting with liquidity. The theory is of the

opinion that supply of money is generally determined by monetary authorities while the demand is a function of income and interest rate. The theory suggests that people demand for money for three motives that are transactionary, precautionary and speculative motives. Transactionary and precautionary motives are said to be dependent on the persons income level. Speculative motive on the other hand is dependent on the interest rate (Keynes, 1936) as cited by Emeka et al. (2015).

Liquidity preference theory is criticized on the grounds that just like the Classical and Neoclassical, the liquidity preference theory is indeterminate. The theory is also criticized on the grounds that it only applies to developed countries where the money market is organized and money is widely in circulation. The theory also ignores the supply side of money and also fails to bring out clearly the idea of hoarding. Liquidity preference theory is also criticized on the account that it ignores the time element by failing to draw a difference between dissimilar degrees of liquidity thus ignoring the complexity system of rates of interest depending on the difference in the liquidity degree (Kumar, 2016). This theory is relevant to this study in that it suggests that the supply of money is generally determined by interest rate policies such as CBR policies and interbank rates while the demand is determined by liquidity preference and is a function of income and interest rate.

2.2.3 Time Preference Theory

The time preference theory was developed by Irving Fisher (1930). This theory tries to explain the trend in the interest rates through demand for accelerated satisfaction. This theory views interest rates as reward for waiting or making a choice to shelve consumption to a future date. According to the Time Preference theory, people generally prefer to spend or consume now over future consumption thus to convince them to postpone their consumption or expenditure requires

an incentive of an interest rate that is attractive enough and worth the sacrifice for the current satisfaction (Fisher, 1930). According to this theory, the more the time to defer consumption, the more the discount given to the returns receivable or cost that is payable to the future (Fredrick, 2002).

According to Fisher, time preference is determined by two principles that are; the willingness and investment opportunity principles. The willingness principle is a function of income while the investment opportunity principle is a function of the opportunity cost of profitable investments (for instance, the interest rate). Just like the Keynes theory, Fishers theory is dependent on income and the availability of investments that are profitable. The Time Preference theory is however criticized on the grounds that it is narrow and indeterminate. The theory is also criticized on the account that although it reorganizes the existence of interest rates, it does not provide methodological procedure for determining the rates. This theory is relevant to this study in that it encourages policy makers to make policies that will encourage a saving culture which will in turn encourage economic growth.

2.2.4 Hedging Theory

According to Lessard (1990) the most compelling arguments for hedging lie in ensuring the firm's ability to meet two critical sets of cash flow commitments: the exercise prices of their operating options reflected in their growth opportunities (for example, the R&D or promotion budgets) and secondly, their dividends. Liquidity models pick up this argument and identify the need to align the demand of funds with the internal supply of funds as the major objective of hedging. In this way, the need to raise costly external finance and the resulting underinvestment and asset substitution problem can be mitigated. Internal shareholders (owner-managers) manage the firm; these internal shareholders are passive, that is, they do not buy issued shares.

Therefore, they maximize the intrinsic value of the existing shares. At time t=0, the firm starts with two purely equity financed portfolios (assets in place). Portfolio 1 matures at t=1 and yields a random payoff x1 . Portfolio 2, on the other hand, yields the random payoff x2 at t=2. The randomness of the payoff from portfolio 1 results from the exposure of the whole portfolio to the financial price S_t . Portfolio 2 is independent of S_t. At t=0, the company can choose a hedging strategy to reduce the riskiness of the cash flows x_1 . The motive to reduce the risk of portfolio 1 results from the fact that the firm knows at t=0, that at t=1 it will have the opportunity to invest the amount I, which offers a certain payoff at t=2 of V^I_2 (I). This investment yields a positive NPV and can be funded out of the internal cash flow x_1, or funds can be raised externally. At t=2, the firm can be liquidated.

The Jensen and Meckling model (1976) assumes that the expected utility of the internal shareholder depends on (i) the market value of the firm, (ii) money wages, which are assumed to be fixed, and (iii) on-the job perquisites, which are inseparable from the firm. If the firm would be completely financed by the owner-manager, he would fully bear the cost of additional perquisite consumption in the form of a reduction in the value of the firm. Once the owner-manager raises external equity capital, he continues to enjoy the full benefit of additional perquisite consumption, while he bears only his proportional ownership fraction of the associated reduction in the value of the firm's stock. Rational outsiders make unbiased estimates of the costs associated with the increased perk consumption, and they pass these costs back to the owner-manager in full, in the form of a reduction in the price they are willing to pay for the securities he initially desires to sell. Jensen and Meckling show that whenever x1 is not sufficient to finance the optimal investment volume in t=1, I * , utility maximizing owner-managers will choose an investment volume I ' , which is below the optimal investment volume. Adler (1982)

argues that in the absence of imperfections such as transaction costs and interest rate risks, the value of the forward contract would be zero at the instant at which it is initiated." Companies could be said to destroy value by entering into forward contracts, that is, forward rate will equate the spot rate according to expectation hypothesis theory, but the company incurred cost (i.e., bid-ask spreads) to achieve the result, which would have been achieved by a do-nothing strategy. In addition, the Capital Asset Pricing Model (CAPM) tends to reinforce the previous views and that if exchange rate risk and interest rate risk are envisaged to be unsystematic they can be diversified away by investors in the process of contracting their portfolios. The critical assumption that underlies this view is that capital markets are perfect. That implies, inter alia, there are no taxes; that there is perfect symmetry of information between management and investors and that volatility reduction strategy are costless. When these assumptions do not hold, or are relaxed, the conclusion is not warranted. If firms are exposed to interest risks in an imperfect environment, however, these exposures can impose costs on the corporation. For example, market imperfections can create an environment in which exposure to volatile interest rates and exchange rates is costly. Hedging helps to reduce these costs.

2.2.5 Modern Portfolio Theory

The ultimate objective of portfolio analysis is to determine the portfolio which provides the investor with the most suitable combination of risk and return (Markowitz, 1959). The investors when seeking high expected returns generally wish to avoid risk (James, H.L and Mary, T.H, 1973).a correct portfolio selection should take into account both the expected returns and risk and reflect the specific needs and wants of the given investor. The investor will analyse the risk of using particular source of seed money to finance the investment (capital structure issues on

debt capital or equity capital when financing such investments). The study attempts to answer problems related to what information is worth for an investment decision. For example the investigation of jointly binary and jointly Gaussian horse race market showed that the initial efficiency. The investor who invests in the stock market X when there is a rate constraint on the side information V; The doubling function Δ(R) is the maximum increase in the doubling rate when V is described to the investor at rate R (Hirschfeld, 1935).

2.2.6 Capital Asset Pricing Model Theory

The Capital Asset Pricing Model (CAPM) of William Sharpe (1964) and John Lintner (1965) marks the birth of asset pricing theory resulting in a Nobel Prize for Sharpe in 1990. CAPM is widely used in applications, such as estimating the cost of capital for firms and evaluating the performance of managed portfolios. The attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk (Hickman et al., 2002). The capital asset pricing model (CAPM) is the most widely used measure of risk, beta, and alpha; it implies that the market portfolio is mean variance efficient and is thereby used to advocate for passive investment. Many academic studies empirically reject the CAPM. The authors illustrate through a reverse optimization method that the CAPM is consistent with the empirically observed return parameters and the market proxy portfolio weights (Brealey et al., 2011).

2.3 Empirical Literature

2.3.1 Non- Interest Income and Performance of Banks

The consequences of non-interest income for the financial performance of commercial banks are not well understood as presented by Abreu and Mendes (2000). An increase in noninterest income improves earnings but an increase in non-interest income seldom occurs without concomitant changes in interest income, variable inputs, fixed inputs, and or financing structure

(Smith and Wood, 2003). As non-interest income trended up, it was generally believed that shifting banks' income away from intermediation-based activities in which bank income was subject to credit risk and interest rate risk, and toward fee-based financial products and services, would reduce banks' income volatility (Stiroh, 2004a). Moreover, it was conventionally believed that expansion into new fee-based products and services reduced earnings volatility via diversification effects. But recent empirical studies indicate that neither of these beliefs holds on average (Guru et al., 2002). DeYoung and Roland (2001) suggests why noninterest income may increase the volatility of bank earnings. Most bank loans are relationship based and as a result have high switching costs, while most fee-based activities are not relationship based (Barry and Laurie, 2010). Most fee-based activities require banks to hold little or no fixed assets, so unlike interest- based activities like portfolio lending, fee-based activities like trust services, mutual fund sales, and cash management require little or no regulatory capital. Thus, fee-based activities likely employ greater financial leverage than lending activities (Abreu and Mendes, 2000). Stiroh (2004a) finds that increased focus on noninterest activities at U.S. commercial banks is associated with declines in risk-adjusted performance.

Stiroh (2004b) study finds potential diversification benefits within broad lines of banking business. Staikouras and Wood (2004) study investigated the diversification effects of non-interest income at banks in 15 different European countries. The study concluded that non-interest income is more volatile than interest income over time; they find negative correlations between these two income streams, which lead them to conclude in contrast to the U.S. studies that non-interest income tends to stabilize bank earning (Molyneux and Thurston, 1992). Structural and regulatory differences explained why these findings for European banks are

different from the findings for U.S banks. Fee-based services are relatively new to many U.S. banks and thousands of small community banks lack the size and expertise to engage in many of these activities (DeYoung and William, 2003).

The figure 2.1a and 2.1b below is an illustration of Jamaican commercial banking sector which gradually expanded beyond its traditional role and sources of income to encompass more activities that generate non-interest income over time. By the close of the third quarter of 2010, aggregate non-interest income of the commercial banks had increased significantly by approximately 489.0 per cent to J$5.3 billion relative to end-March 1999 while interest income increased by roughly 110.0 per cent during the same period to total J$13.2 billion at endSeptember 2010. During this period, the performance in non-interest income has been underpinned by the increasing prominence of non-cash means of payment, such as automated Telling machines (ATMs) and pointof-sale (POS) technology, since its introduction in the sector over two decades ago

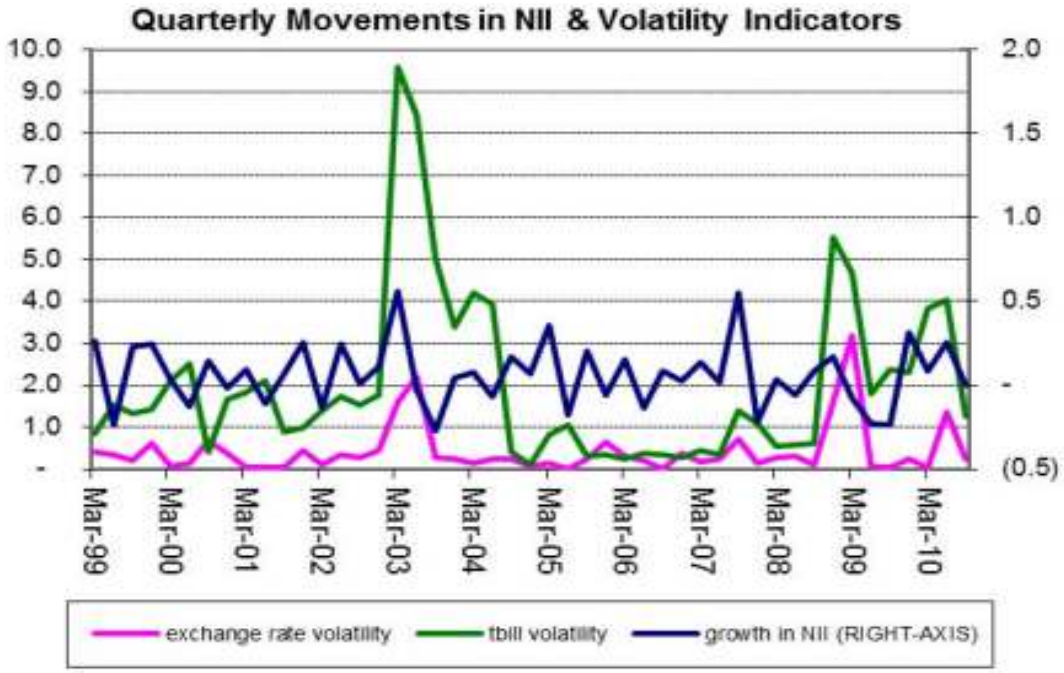

Figure 2.1a Quarterly Movements in NII and Volatility Indicators

The analysis of the data revealed that periods of strong increases in non-interest income have generally coincided with episodes of substantial macroeconomic volatility. This relationship was particularly evident during the March 2003 and December 2008 quarters when there was significant instability in the foreign exchange market. The performance in non-interest income during these periods largely reflects increased income from trading profits on securities as well as foreign exchange gains. There was a moderate falloff in non-interest income during most of 2009, which may have reflected the continued weak performance in economic activity during that year. In addition to the rise in aggregate levels of non-interest income in the commercial banking sector, various measures of the performance in non-interest income suggest that its relative importance steadily increased over the said sample period.

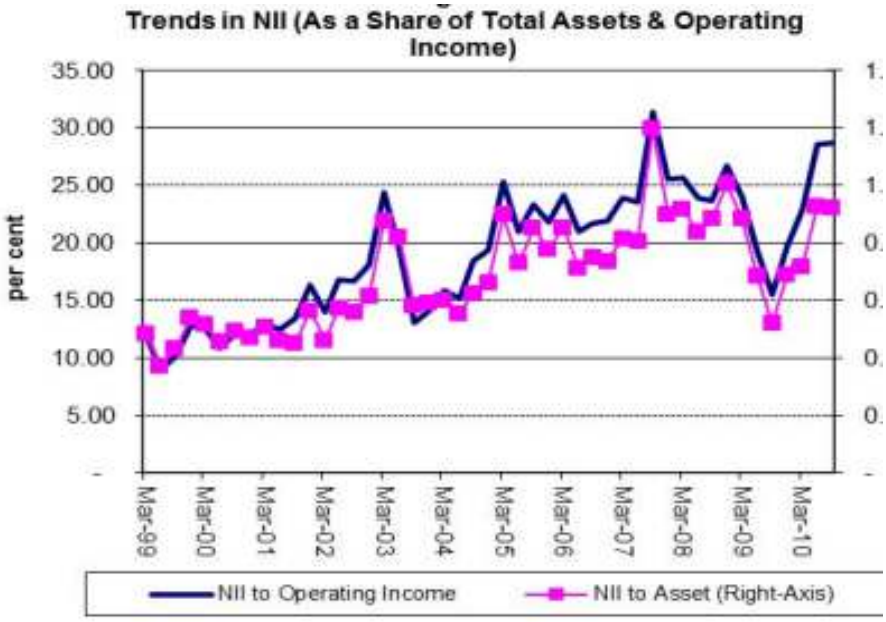

Figure 2.1b: Trends in NII

The banking sector's profit before tax increased by 20.5 percent from Ksh. 74.3 billion in December 2010 to Ksh. 89.5 billion in December 2011.The growth in profit was attributed to higher levels of revenue inflows from the growth in credit portfolio and fees on innovative

products offered by institutions (CBK, 2011). Innovation in banking industry relates to new ways of doing financial business including online banking (E-Banking), phone banking (M-Banking), Agency Banking. Non-interest income is net income derived from fee-based banking services, such as E-Banking and Agency banking (Stiroh, 2004a). Ngigi, (2012) study assessed the effect of financial innovation on the financial performance of commercial banks as the key players in the banking sector over a time span of 4 years. The study note that the financial industry in Kenya has a wide range of transformation all aimed at improving financial performance of many financial institutions (Ratan, 2008).Yet in spite of that, the study held that the relationship between financial innovation and financial performance is not always positively correlated because there are cases of negative correlation between the two being reported. Banking industry deregulation removed a whole host of restrictions that had stunted the evolution of the banking industry, constrained the efficiency of financial product markets, and extended the lives of thousands of poorly run and/or suboptimal-sized commercial banks. Advances in information and communications technology like the Internet, ATMs, new intermediation technologies and the introduction and expansion of financial instruments and markets (Stiroh, 2004a). These innovations were meant for increasing the non-interest income base to boost on profitability.

Agency banking is a type of bank partnerships with non-banks, typically retail commercial outlets, ranging from lottery kiosks, pharmacies, post offices, construction goods stores providing distribution outlets for financial services Kamau (2012). Agency banks offer normal banking services such as cash deposits and withdrawals, disbursement and repayment of loans, salary payments, pension payouts; transfer of funds and the issuing of mini bank statements, all through shared infrastructures conclude Kamau (2012). In addition, the agency network allows banks to reach new customers, who can open new accounts, perform credit and debit card

applications and cheque book requests (Timothy et al., 2006). This arrangement enables banks to tap into the various sources of Non-Interest income for increased profitability in the banking sector.

Tom (2015), studied the effect of liquidity on profitability of commercial banks in Kenya using a descriptive research design approach over a period of 5 years from 2010 to 2014. Secondary data was used and focus was on current ratio, liquidity ratio, deposits and interest rate on profitability and found out that liquidity has a positive effect on profitability of commercial banks. The study concluded that if Liquidity problems are not addressed at the earliest opportunity, depositors demands may prove difficult to meet, bank's profitability and capital would be impaired and in extreme circumstances, it may cause the collapse a bank and recommended that liquidity risk may be mitigated by maintaining sufficient cash reserves, raising deposit base and decreasing the liquidity gap. Adequate cash reserves will decrease the bank's reliance on the repo market which consequently will reduce the cost associated with overnight borrowing and insurance cost. The study did not consider the effect of foregone opportunity to invest in the market despite the need to maintain sufficient reserves. Sufficient reserves were not operationalized in the study thus being ambiguous. Raising deposit base is also associated with interest to be paid to depositors which could be costly to the bank, thus this study sought to shed light as to the level of both cash reserves and deposit base to hold considering the need to diversify the revenue to the banks.

A study conducted by Odunga and Nyangweso (2014), on credit risk, liquidity and operating efficiency for low and high market shares commercial banks in Kenya found that operating efficiency and credit risk proxy by loan loss provision to total equity ratio was significant while liquidity proxy by interbank ratio was insignificant in explaining operating efficiency. The study recommended that banks should seek on mechanisms to improve on these variables in readiness

to improve operating efficiency and remain competitive in the market. But the study failed to address in detail the effects of these variables: hedging and interest rate modeling on the relationship between noninterest income and financial performance of commercial banks in Kenya. The financial performance of commercial banks looks into the subjective measure of how commercial banks use their assets to generate revenues. This is the general measure of banks' overall financial health over a given period. This financial performance is highly affected by the decisions made to effectively utilize the assets to increase profit, (Abreu and Mendes, 2000). The decision made by commercial banks indicates how effective the management is working with a mathematical value of the operational efficiency being the quotient of the revenues from the total assets, (Saira et al., 2011). The consequences of the non-interest income on the overall financial performance of banks show that an increase in non-interest income will improve earnings. However, as Smith and Wood, (2003) noted this increase rarely occurs, and one needs to look at reasons why this may not be happening without changing the financing structure and other structural changes within the organization. This study's findings bring out the inadequacy of a no clear linkage of interest rate modeling, hedging, non-interest income and financial performance of banks which is the focus of this study.

The proportion of the non-interest income increased during the 1990s, it was expected that banks would move more from their dependence on the intermediation-based activities to fees-based financial solutions to their customers (Stiroh, 2004). Further, it was expected that banks expand into fees-based solutions and services with a goal of income diversification. On the contrary, however, this has not been the case on average as banks have not directly increased this diversification thus yielding to a possibility that non-interest income does not directly improve performance of banks, (Guru et al., 2002). The modeling of interest for various diversified

portfolios in the bank influence the level of acceptance of the financial service by the customers either as deficit units or surplus units as the banks perform their intermediary function. Interest rate is the cost of borrowing money and is considered as a form of income; if not modeled well it will lead to loss of income or exploit the customers seeking the financial product. For commercial banks, interest represents operating income, which is income from normal business operations. The core purpose of a banks' business model is to sell money, as such, its primary source of income is interest, and its primary asset is cash. In Kenya, commercial banks rely heavily on non-interest income when interest rates are low and tend to use it as a marketing tool when rates are high.

Barry and Laurie, (2010) noted that most of the interest income is directly sourced from bank loans. These loans are mostly based on relationships. This means that customers have limited switching abilities making them loyal. The effect is that most of the interest income is long term and thus commercial banks tend to have a higher affinity for this income. Bourke (1989), observed that most of the inputs for the interest income are highly variable regarding interest expense while for non-interest income; the main input is fixed costs in the form of labor cost mostly from full-time employees. With that in mind, commercial banks have been rather conservative with the uptake of the fixed costs which yield noninterest income.

The degree to which commercial banks rely on non-interest fees to make a profit is a function of the economic environment. Market interest rates are driven by benchmark rates such as the Inter Bank Rate (IBR). The IBR, or the rate at which banks lend money to one another, is determined by the rate at which the CBK reserve pays banks interest. As interbank rate decreases, commercial banks make less profit from interest income hence a need to increase non-interest income. The subject still remains a grey area as most empirical works have focused on the causes

of financial performance with little linkage to noninterest income and financial performance of banks. To realize the same or improved performance banks must lend more at the current interest rates or diversify in to noninterest income strategies. Lending above the optimal book position will portend future challenges related to credit default. The adjustment on interest rate spread has had significant effects on the overall profitability of banks in the fourth quarter (Q4) in 2018 and yet affecting the overall profitability of the banks in 2018 and 2019 as highlighted in table below:

Table 1: Highlights of Banking Sector Q1, 2019 Compared to Q1, 2018

Parameter	Q1 2018	Q1 2019	Change (Bn)	Change (%)
Net profit	28.71	23.73	**- 4.98**	**-17.35%**
Interest Income from Customer loans	82.87	69.26	**- 13.61**	**-16.42%**
Income from government securities	22.81	24.55	**1.74**	**7.63%**
Non-Interest Income	30.56	39.15	**8.59**	**28.11%**

Source: Business Daily Africa Website as Reported from Financial Reports.

Banking sector industry non-interest income grew by 28.11% in Q1 2019 whereas interest income fell by 16.42% in the same Q1. The trend goes on as banks became more and more cautious with unsecured lending. For banks to maintain stability in profitability diversification in noninterest income is the way forward. Industry Return on Equity (ROE) has fallen from 18.2% in June 2018 to 13.6% in March 2019 (CBK reports, 2019). “These numbers falling reflect the lower levels of profits in some of these institutions. All the listed commercial banks have reported a reduction in profitability for Q1 2019. For instance, Equity bank, National Bank, ABSA Bank, Co-operative Bank, KCB and Standard Chartered Bank have announced a reduction in Q1 2019net profitability by 7.25%, 42.23%, 11.5%, 10.8%, 1% and 7.02%

respectively on the account of interest rate cap. The same banks have reported a significant increase in noninterest income for Q1 2019 compared to the same period in 2018.

Banks should maintain a minimum cash balance to shield them from unforeseen shocks and avoid liquidity problems (Jenkinson, 2008). To mitigate liquidity risk, a bank may have to increase its cash reserves despite the fact that it might be a costly option (Holmstrom & Tirole, 2000). Therefore, banks hold minimum cash balance to shield themselves against liquidity problems and provide funds to depositors when needed so as to improve its reputation and win their trust (Arif & Anees 2012).The liquidity of an asset should be based on its capacity to easily get converted to cash instead of its trading book classification or its accounting treatment (Committee of European Banking Supervisors (CEBS, 2008); further it emphasizes that a bank should uphold a liquidity buffer, comprising of cash and liquid assets. This buffer provides a cushion to withstand the liquidity stress in a "survival period". The sentiments for diversification into non funded income are well captured by Equity bank's Chief Executive Officer Dr. James Mwangi during an August 2019 half year investor briefing: "The bank is operating in a challenging banking environment. The banking industry is facing a perfect storm. You have to place a bet where the probability of winning is higher. We are now moving from fixed cost structures to variable cost structures which are not capital intensive. I believe payment and transaction processing will be the biggest source of income for the bank."

Noninterest income is revenue that is derived by commercial banks from areas that are outside their lending operations or any other income to the banks that is derived from other activities other than their core business of taking deposits and extending loans to their customers at interest. This income can also be referred to as fees income as most of it is charged on customers in the form of fees (Ng'endo, 2012).

Non-interest income is a bank income derived primarily from fees including deposit and transaction fees, insufficient funds fees, annual fees, monthly account service charges, inactivity fees, check and deposit fees and credit card charges (including late fees and over-the-limit fees). Noninterest income can be anything from asset sales to fees from penalties related to overdrafts or withdrawals. Some commercial banks rely heavily on fees from automated teller machines, mobile banking, and general transaction fees. Noninterest income is particularly important in business banking relationships. Banks generally charge businesses and companies more for non-interest transactions.

Ritter Silber and Udell (1996), noted that noninterest income has grown in its popularity as commercial banks are moving from the traditional functions of just taking deposits and lending out money. Tight regulations and competition on the interest rates have been some of the key factors that have significantly reduced interest income over time leading commercial banks into diversification of income. These sources of revenue have become more important in recent times as banks shift from traditional interest income to non-traditional sources of revenue, known as noninterest or fees income. The income has since then become a competitive edge and of significant influence on the profitability and performance of the commercial banks.

According to Thygerson (1995), noninterest income is generated as a result of three functions of intermediation namely origination, services and portfolio management. Origination sources refer to processing fees such as loans, credit cards, and accounts applications. Services fees refers to all fees charged by the bank for the services that they offer their customers such as account maintenance fees, safe custody, letters of credit and all other services they offer. On the other hand, portfolio management has been brought about by banks shifting into the mutual funds and

investment into the money market as well as other sale and management of their financial securities.

Deposits are the lifeline of the banking business. Most operations of the bank utilize deposits. If depositors withdraw their money from the bank, it will create a liquidity trap for the bank, (Jeanne & Svensson, 2007; Kumar, 2008) forcing the bank to borrow funds from the central bank or the inter-bank market at higher costs, (Diamond & Rajan, 2001). On the contrary, a bank having enough deposits in its account will not have the above-said problems. Deposit mobilization in the banking sector, is intended to encourage customers to deposit more cash with the bank to empower the bank to lend more loans and generate additional revenue for them, (Kazi, 2012). The main business of banks is accepting deposits and granting of loans. The more they lend, the more profitable they become. Banks depend on customer's deposits to generate funds for granting loans to other customers since they do not have a lot of their own money.Therefore, to improve its profitability, it is imperative for a bank to increase deposits. Gatev and Strahan (2003) inflow of funds give a natural hedge to banks for outflows due to loan advancements. Therefore, banks use deposits to mitigate corporate risk which include: credit risk, operational risk and liquidity risk which are functional units of any sound financial system.

During the 2007 Nairobi stock and market report, commercial banks recorded a 49% decrease in interest income and this was a significant drop. A number of the banks remained profitable; which means that there was a significant growth in non-interest. This downward pressure on the interest rate margin has been the main driver towards diversification into alternative sources of revenue for banks. This has helped in the stabilization of earnings and the reduction of risk exposure from over dependence on interest income, (Thygerson, 1995). Having looked at the developments in the revenue diversification from the different commercial banks, it is evident

that the share of the interest income has been shrinking over time. Banks have thus been forced to become more creative with other sources of revenue. This means that without noninterest income, commercial banks in future may not be profitable. It is unclear on the effect size of noninterest income to the totality of bank performance. Therefore this forms the basis for this study to establish this link between non-interest income and bank performance.

2.3.2 Central Bank Rates, Commissions on Loans and Financial Performance of Banks

The central banks have a responsibility to maintain a certain level of stability within the financial system of a country. It performs this task first through establishing the lowest rate of interest that it charges on loans to banks which is known as the Central Bank Rate (CBR). The CBR acts as the base for all monetary policy operations so as to ensure clarity and certainty in the monetary policy implementation. Matemilola, Ariffin and Muhtar (2015) posit that the pass-through of the central bank rates to commercial bank lending rate is an important topic since it helps measure the effectiveness of monetary policy which is used to control inflation and also stabilize the country's economy.

Gichuki, Oduor and Kosimbei (2012) examined the optimal monetary policy instrument choices of for Kenya for the period 1994 to 2010 using the error correction model (ECM). The study found that the interest rates result in minimum losses in output compared to the reserve money instrument. The researchers also established that combining the instrument minimizes losses from equilibrium output and is better than other instruments. The study concluded that there is a need for the CBK to adopt a pure interest rate instrument policy to be able to use isolated instrument. The study also concluded that there is a need for the CBK to enact a monetary policy conditions index that would help enhance the implementation of a combination instrument policy.

According to European Central Bank (2013), there are three reasons as to why other bank lending rates do not reflect the behavior of the central bank policy rates after a crisis period. These are; First, while the lending rates by the banks to households and businesses is normally long-term the central bank rates are always short-term rates thus the difference between the central bank rates and the lending rates by banks (spread) will reflect the maturity risk premium. Second, the adjusted central bank rates do not represent the marginal cost of funds for banks even if the maturity risk premium is corrected using swap rates. Lastly, bank lending rates do not reflect the behavior of the central bank policy because banks acquire funds from various sources that include; interbank market, deposits and unsecured bonds all of which differ in nature in terms of rates which is attributed to difference in risk characteristics and maturities.

Muriuki (2013) determined the role of central bank rate on profitability of commercial banks listed at NSE in Kenya. The study used data gathered from bank's financial statements and published accounts. The researchers established that with all dependent factors constant, the profitability of the commercial banks will be 1.147. On the other hand, taking all independent variables constant, an increase in the central bank rate by a unit increases the commercial banks profitability by 0.752. The researchers then concluded that the period 2007 to 2012 saw drastic changes in the country's CBK and that the increase in CBK rates over the period 2007 - 2012 has doubled even though there were some fluctuations in the rates in the same period. From the conclusions, the study recommended that commercial banks should come up with strategies to cope with the changes in CBR and that more investments should be done on research to be able to predict such occurrences.

Kamaan (2014) determined the effect of monetary policy on economic growth in Kenya and established that one standard deviation in the monetary policy shock as shown by the CBR has a

negative and insignificant effect on the output in the first two months which then becomes positive and insignificant in the next four months. Illes, Lombardi and Mizen (2015) analyzed why bank lending rates diverge from policy rates after the financial crisis in Europe. The researchers suggested that the global finance crises have over time prompted central banks in many countries to cut short term policy rates to levels close to zero. The study established that the lending rates did not drop as much as the central banks rates would have suggested thus comparing lending rates to central bank rates is misleading. This is attributed to the fact that banks do not solely depend on central banks for all their funds, and after the crisis, the costs of funding by banks rose significantly. The study concluded that because of the divergence even with the crisis, the rates the banks charge across eleven countries in Europe remained stable.

Matemilola et al. (2015) examined the impact of monetary policy on bank lending rate in South Africa using the asymmetric error correction models and the momentum threshold autoregressive. The researchers established that bank lending rate in South Africa change with a decrease in the money market rate. The researchers found that South African commercial banks change their lending rate downward but the lending rate appears rigid upward. The study also established a positive relationship between monetary policy and the lending rates by commercial banks. The study was however based on South Africa and not Kenya.

Lending is the major trade task for commercial banks. The loan portfolio is in most cases the most important asset and the predominate income. Lending has been, and still is, the mainstay of banks' industry, and this is truer to rising economies like Kenya where capital markets have not well evolved. To a number of the transition economies, however, and Kenya specifically, lending actions is a debatable and a troublesome topic (Richard, 2006).

The best loan profile professionals have aimed their work on prudently approving loans and very carefully following bank loan proficiency. Actually these activities are core activities of the bank and are seen to revolve around loan profile administration, study involving credit worthiness concerns, (Von Stauffenberg, 2002). Standard routines have been highly dependent on excessive reliance on credit worthiness, nonaccrual or default, and keeping an eye at the negative credit score traits. Such information has been the basis for the majority of the structuring of the fees and commission relating to loans and advances. Proper profiling of the loans and advance has been the key towards profitably of the banks from this income stream.

DeYoung & Roland, (2001) noted that the replacement of the traditional lending activities with more of fee-based activities would tend to increase their income. However on their 472 commercial banks in the United States sample, this was also found to increase the earnings volatility. This means that it ends up being a double edged sword scenario that must be handled with great care.

Some of the notable fees and commissions relating to loans and advances consist of penalties, negotiation fees and application fees. The total income is highly dependent on the volumes and values of the loans and advances advanced to the customers. Von Stauffenberg (2002, noted the beauty of the loans and advances forms the main income stream for commercial banks and save for the interest income, there are still other sources that can be manipulated to the advantage of the banks and are expected to have an impact on the overall performance of the commercial banks. Several studies have focused on the interest income accrued from the loans and advances. The studies have detailed how the banks come up with the rates, how they affect their performance and several other concerns relating to interest income. It was expected with capping of interest rates this income would show a significant reduction from the previous years.

However, little is documented regarding the contribution of the commission from the loans and advances and their contribution to the non-interest income and the overall effect on the commercial bank's performance.

2.3.3 Interbank Rates, Transactions Account Income and Financial Performance

The interbank lending markets are markets which gives a platform for banks to extend loans with maturities of less than one week to one another. The maturities of the loans are mostly overnight. The loans are advanced at the interbank rate also referred to as overnight rate if the term is overnight (Michaud & Upper, 2008). The interbank rate is the interest charged on the short-term bank to bank transactions and depends on the term length or the liquidity of the market. Banks perform interbank transactions to comply with regulations such as minimum reserve requirements or to manage liquidity (Angelini et al. 2009).

Interbank markets play a crucial role in the financial sector of any economy. They help banks effectively management their liquidity. The interest rates in the three month interbank market are used as benchmarks when pricing fixed-income securities in the country's economy (Heider & Hoerowa, 2009). Normally, the interbank markets experience smooth transactions with broadly stable rates in both the unsecured segments and secured as well as in the different collateral classes. But since August 2007, the transactions in the interbank markets have all over the world become rigorously impaired (Carletti, 2008). According to Brunner Meier (2009), tensions in the interbank market to a great extent contributed to the development of the 2007-2009 crisis. Worldwide, central banks in many countries have responded to the tension that is experienced in the interbank markets by introducing support measures that would help prevent market-wide liquidity problems in individual institutions from melting into solvency problems.

The empirical literature in this area of knowledge include; Ashcraft and Bleakley (2006) examined how access to the federal funds market is affected by changes in the measures of private and public information. The study employed data from both public and private banks. The study focused on bank loan portfolio quality. The researchers established that markets react to changes in the public measures of loan portfolio quality. The researchers established that banks exploit the changes that occur in the private measure of loan portfolio quality through amassing demand in a manner that is consistent with moral hazard and also through increasing their borrowing frequency and liquidity risk in reaction to private information.

Freixas and Jorge (2008) examined the role of interbank markets in monetary policy using a model with rationing. The researcher's objective was to analyze the impact of asymmetric information in the interbank market. The study established that asymmetric information is important in the micro-foundations that transmit monetary policies. The study established that with credit market rationing, interbank market imperfections cause equilibriums. The researcher also suggested that the two main implications that result from this are: first, the equilibrium causes the magnitude effect which involves reconciliation of the irresponsive business investments to the user cost of capital with the large impact of monetary policy. Second, it causes Kashyap and Stein liquidity effect which involves banks' liquidity positions conditioning their reaction to monetary policy.

Wang, Wang and Zhang (2012) analyzed the interbank loan interest rate fluctuation characteristics and the value at risk (VAR) risk of China's commercial banks using Exponential Generalized Autoregressive Conditional Heteroskedastic (EGARCH) Model. The researchers found that fluctuation in the china's interbank lending and borrowing market rates is volatile to a large extent which indicates that the market has been to a great extent market-oriented. The study

found that the value and standard deviation of risk in the national commercial Banks and other financial institutions in China is bigger and changes dramatically. The interest rate risk value of the City commercial Banks and foreign banks was found to be smaller but the performance was stable. The rural credit cooperatives were found to have the smallest risk and the most stable performance.

Brauning and Fecht (2012) assessed the association between relationship lending and the liquidity price in the interbank market in Germany. The study used German interbank payment data. The data included panels of unsecured overnight loans from 1079 distinct borrower-lender pairs. The researchers found that banks depend on repeated exchanges with the same counterparties to trade liquidity. On the price of liquidity, the study established that before the 2007/08 financial crisis the lenders had already started charging their borrowers higher interest rates. The study also established that the borrowers paid lower rates to their relationship lenders on average compared to instant lenders during the crisis.

The study by Kamaan (2014) to determine the effect of monetary policy on economic growth in Kenya found that in the first two and a half months of the reviewed period, a one standard deviation shock of the interbank rate has a positive and significant relationship with inflation. However for the next sixth months the relationship continues to be positive but insignificant. Kelilume (2014) analyzed the effect of monetary policy rate on interest rates in Nigeria for the period 2007-2012. The study employed monthly time series data which was acquired from the Central bank of Nigerian Statistical Bulletin. The researcher established that it is only the relationship between interbank rates and monetary policy rate that shows the effectiveness of monetary policy. The study also found that the weak relationship between savings deposit rate

and the monetary policy rate is explained by the low incentives for savings. This study however, focused on economic growth and not the performance of commercial banks.

Several studies have found that fees-based income stabilizes profitability. Some of the most stable fees in a commercial bank relate to the account transaction fees and the account charges. These consist of all those charges charged by the bank for the services they offer to their customers. Saunders and Walters, (1994) found that the expansion of these banks' activities reduces risk. The main risk reduction gains arise from the diversification and reduction of dependency on the interest income. Proponents of this view point out that those studies which found risk-reduction benefits from asset diversification generally report their findings in terms of potential, not actual realizations.

These authors tend to suggest that a modest amount of fees-earning activity captures all the potential for risk reduction. Stiroh, (2006) noted that most of the fee-based activities and which generate most of the non-interest income brings in increased earnings volatility within commercial banks. This calls for caution while increasing the base for the fees. On the other hand however, Gischer and Jüttner (2003) found a weak negative relationship between Return on Assets (ROA) and the fees income to interest income ratio for 19 Organization for Economic Co-operation and Development (OECD) countries. Esho, Kofmann and Sharpe (2005) showed that for a sample of Australian Credit Unions, the ROA is negatively associated with the increment of transaction fees. Against expectations, risk rises in line with a higher revenue share of this income source. Conversely, revenue shares of fees received for off-balance sheet facilities and fiduciary activities do not seem to have any influence on risk and return, possibly on account of the relatively small share of this income category.

According to Ng'eno (2012) expansion into fee-based services require substantial fixed costs e.g investment in technology, staff and distribution channels. Small banks may find this kind of investment a challenge because of the resources required. As such for these banks rising transactional fees will diminish ROE and enlarge earnings volatility. This study therefore seek to determine the exact state of the Kenyan commercial bank's performance in relation to transactional and account related fee-based commission. Banks have been revising upward their tariff guides on transactional fees and account related charges with hope of earning more income and countering the effect of interest rate cap. The responsiveness of customers to this revision will determine the volatility and the effect size this income. This study sought to determine the exact relationship with performance of banks bearing in mind the conflicting positions taken by different authors.

2.3.4 Repurchase Agreements Rates (Repo Rate) , Investment income and Financial Performance

Repo is the rate at which the commercial banks borrow money from the central bank in the event of any short fall. Repo and reverse repo are also defined as transactions which involve one borrower agreeing to sell securities to another lender with a condition that he/she can repurchase the same or similar securities at an agreed upon price and interest rate after a specified period (IMF, 2008). Reverse repo rate (RRR) is the rate at which commercial banks lends money to the central banks. Repo policy involves the rules and regulation that surrounds the central bank's lending to the commercial banks. Central banks use Repo as a policy to balance the liquidity in the banking system. This is through using Repo rate which involves lending to banks to add money to the system and using Reverse repo rate which involves borrowing from the banking system to remove money which is floating (Vanitha et al., 2013).

Repo markets are also referred to as secured markets. Globally, the repo markets have since 2002 doubled in size to about $10 trillion in gross amounts outstanding in the United States and comparable amounts in the euro area just before the August 2007 global the crisis (Heider & Hoerowa, 2009). The repo markets forms an important part of the monetary policy transmission mostly since they are backed by collateral securities which are comparable to the securities which central bank's use in their refinancing operations (Heider & Hoerowa, 2009). In a study by Garleanu and Pedersen (2010) it was established that lowering haircuts in central bank repo would result to a rise in the prices of the affected assets.

Vanitha, Nageswari and Srinivasan (2013) analyzed the impact of reverse repo rate and cash reserve ratio in National Stock Exchange (NSE) CNX bank index. The researchers observed that the Reserve Bank of India change the statutory liquidity ratio (SLR), cash reserve ratio (CRR), the Repo Rate prime lending rates (PLR) among other policies every year in the effort to control the country's money supply. The researchers focused majorly on the relationship between reverse repo rate, cash reverse ratio and the share price of banks listed at the National Stock Exchange. The study found that the share prices reacted following the announcements of cash reserve ratio and reverse repo rate.

Mandel and Tomsik (2014) determined the monetary policy efficiency in conditions of excess liquidity withdrawal. The study used time series of approach to analyze monetary policy efficiency data for the period 1998 – 2011. The researchers established that the monetary policy of Czech National Banks that it operates in a state of excess liquidity withdrawal through repo operations is efficient. The study concluded that an increase in repo rate on withdrawal repo leads to an increase in the commercial bank's interest rates which in turn leads to a decrease the

credit activity of commercial banks. This implies that Czech National Bank's has successfully implemented its restrictive monetary policy.

Dunne, Fleming and Zholos (2014) examined the relationship between European Central Bank (ECB) monetary operations and the interbank repo market using sovereign bonds as collateral. The researchers established that immediately before the financial crisis, the interbank market was very sensitive to increases in the interest rates. This implies that monetary operations were found to directly affect interbank repo market activity before the financial crisis. Miglietta, Picillo and Pietrunti (2015) examined the impact of Central Clearing Counterparties (CCPs) margin policies on repo markets in Italy for the period 2011 and 2014. The study employed contract level data that was based on the general collateral (GC) section of Italy's Repo market. The researchers established that initial margins that were paid by contributors had a significant positive effect on the cost of funding and that the effect is the same across different subsamples and model specifications.

Fecht, Nyborg, Rocholl and Woschitz (2015) analyzed collateral, central bank repo and systemic arbitrage in German for period 2006–2010. The researchers focused on the relationship between the central bank and commercial banks. The study employed a comprehensive dataset of liquidity uptake in repo by German banks' for the period 2006–2010. The study established the existence of systemic arbitrage which involved banks funneling credit risk and low quality collaterals on to the central bank's balance sheet. The researcher also established that weaker banks used lower quality collateral to demand liquidity from the central bank. The study also found that systemic arbitrage increases the interbank market's fragility. The study then concluded that the exceptional monetary policies introduced by the ECB to respond to the crisis had increased the scope for systemic arbitrage.

Nyborg (2016) examined the central bank's collateral policy and its financial fragility. The researcher focused on the role of central bank collateral policy in relation to financial stability. The researcher established that the collateral framework in the euro area affects the market discipline. The study also established that haircuts in the Euro-system repo do not react to the market forces and that the most appropriate collateral have no market prices which implies that the necessity for theoretical prices and collateral policy will favor collaterals that are illiquid and bank-originated. This enhances a bank-oriented financial system, which increases financial fragility and reduces innovation. This study however, focused on financial fragility and not the performance of commercial banks.

Dividend represents a distribution of earnings to the shareholders of a company that are usually declared at Annual General Meetings and paid to shareholders of record. Dividend or profit allocation decision is one of the four decision areas in finance. As noted by Ross, Westerfield and Jaffe (2002) companies view the dividend decision as quite important because it determines what funds flow to investors and what funds are retained by the firm for investment. Dividend policy can also provide information to stakeholders concerning the company's performance.

Kwan (1997) studied the implications of securities activities on bank safety and soundness. He examined the returns on securities activities conducted by Section 20 subsidiaries (subsidiaries that were authorized by the Federal Reserve Bank to conduct bank-ineligible securities activities) and their relationship with the returns on banking activities. He found that securities subsidiaries tend to be riskier but not necessary more profitable than their bank affiliates. Nevertheless, in this study, securities subsidiaries appeared to provide diversification benefits to bank holding companies. Kwast (1989) found that both the mean and standard deviation of securities activities'

returns are greater than those of non-securities activities. Some potential for diversification gains is found, although this appears to be quite limited.

Uwalomwa (2012), in a research study to explore the association between the financial performance and dividend pay-out among listed firms' in Nigeria. The research study identified that there is a weighty affirmative association between the performance of firms and the dividend pay-out of the sampled firms in Nigeria. In an equally similar matrix, dividend income of commercial banks plays a significant role on the overall performance of banks. As noted it's expected that there is some direct relation between the investment income received and the overall performance for the commercial banks listed on the NSE. Previous studies have however looked into details on the relationship between the amount of investment income received by the commercial banks and their contribution towards the overall banks' performance. This study seeks to find this link too and establish to what extent volatility of income from this source would affect the overall banks profitability. Since the interest rate cap in August 2016, banks have adopted new investment roles through insurance underwriting, brokerage activities and investments in mutual funds. The overall effect on performance has been inadequately determined.

2.3.5 Hedging and Financial Performance

Financial economists and policymakers have historically focused on banks prospective channels of systemic distress through bank runs and the important reduction in the supply of credit. This attribute of banks is behind the classic policy rationale for regulating them. The ongoing move towards financial markets arm's length transactions and active trading, however, has shifted focus to the potential impact of a hedge fund led disruption on financial institutions, markets, and the broader economy (McCarthy, 2006). Financial intermediaries have many ways to reduce

their exposure and mitigate the impact of financial market shocks. The first line of defense is the intermediary's counterparty credit risk management (CCRM) system. The banks establish limits; implement risk reporting infrastructures; and define haircut, margining, and collateral policies all designed to assess credit risk and limit their counterparty exposure to risk. Effective CCRM is obviously needed for any counterparty, but hedge funds differ in important ways, such as in their use of complex trading strategies and instruments, leverage and convex compensation structures, all of which increase the challenges to effective CCRM. This study examines how hedging may generate "market failures" that make CCRM for exposures to hedge funds intrinsically more difficult to manage both for the individual firm and for policymakers concerned with systemic risk and the financial performance of banks listed at NSE. A mid the rapid growth and innovation in global capital markets, financial stability and systemic risk have emerged as top policy concerns around the world. The systemic crisis occurs when a shock affects a considerable number of financial institutions or markets in a strong sense, thereby severely impairing their general well-functioning (of an important part) of the financial system. The well-functioning of the financial system relates to the effectiveness and efficiency with which savings are channeled into the real investments promising the highest returns (DeBandt and Hartmann, 2002; Bordo, Mizrach, and Schwartz, 1998).

Total financial risk is a term used to refer to both diversifiable and non-diversifiable risk. While diversifiable risk can be diversified and eliminated, non-diversifiable risk cannot be eliminated. Types of common financial risks include insurance, credit risk, compliance, liquidity risk, operational risk and market risk. The focus of this study was the market risk which is the risk as result of movement in market prices and is determined by four factors equity risk, interest rate risk, currency risk and commodity risk (Sharpe, Alexander & Bailey 2013).Equity risk basically

refers to financial risk as a result of holding equity in a particular investment; interest rate risk refers to risk that arises to bond traders as a result of volatility in interest rate; commodity risk refers to risk that arises as a result in volatility in commodity pricing, whereas currency risk or foreign exchange risk is risk arising from volatility in currency rates (Horne &Wachowicz 2012).To mitigate the effects of these risks on the business growth, many businesses are adapting and institutionalizing financial risk management strategies. Financial risk management has therefore become one of the most important business strategies of firms. Firms that do not adapt financial risk management strategies are likely to witness poor growth patterns compared to those that adapt financial risk management strategies. There exist several financial risk management strategies that may be used to reduce the financial risks such as portfolio diversification for diversifiable risks and hedging practices for non-diversifiable risks. (Sharpe et. al. 2012) Among risk mitigating strategy that is commonly used by firms is hedging. Hedging reduces the risk of future price movements which might affect a firm adversely if not well managed (Horne &Wachowicz, 2012). Hedging is done by a firm or individual to protect against a price change that would otherwise negatively affect profits (Brigham &Ehrhardt, 2014). It provides relatively inexpensive and highly liquid positions similar to those obtained with diversified stock portfolios (Sharpe, Alexander & Bailey 2013). To hedge a firm can use a wide range of financial instruments, including forward agreements, futures contracts, options or swaps, to achieve their hedging goals. Bartram et al. (2011) on a survey of non-financial firms from 47 countries found out that the use of these instruments reduced firm's total risk and is more experienced in firms with higher exposures to interest rate risks, exchange rate risks and commodity prices risks. In United States, 83% of hedging firms use forward agreements, futures contracts, options or swaps to hedge foreign exchange risk, 76% use them to hedge interest rate

risk and 56% use them to hedge commodity price risk (Bodnar et al., 2008). It follows therefore that forward agreements, futures contracts, options and swaps are commonly used in hedging interest rate risks, foreign exchange risks, and commodity price risks. In developing countries however, use of derivatives as instrument of risk mitigation is unpopular and countries such as India and South Africa use derivatives instruments only on short term contracts which include futures, forwards and swaps (Minnit, Goodwin, & Stacey, 2007); (Sivakumar & Sakar, 2011). A case of hedging in the mining industry in South Africa for instance where risk arise as a result of unsuccessful exploration, input price volatility and cost of production necessitate use of fixed forward exchange rates, interest rate swaps as mechanisms of hedging, which has contributed to stabilization of firms in the industry which would have otherwise experienced downturn (Minnit, Goodwin, & Stacey, 2007).In support of this, Blaaw (2009), attributed the resilience of third world economies like South Africa during global financial crisis(2008) to the strong structure of its capital markets, and also to the fact that derivatives were used to mitigate risk which was not present in the capital market of Nigeria. The Researcher further noted that poor risk management could lead to massive losses and near collapse of institutions. In Kenya, though adequate structures have put in place to facilitate hedging of interest rate risk especially among commercial banks, there is no statistics to indicate the extent of hedging by Kenyan firms (Kothari, 2014). In Kenya, the major source of financial risk is the issue of inflation. Kenya has in the recent past experienced one of the worst inflation instances since independence (CBK, 2010). This witnessed the stagnation of numerous projects and upward fluctuation of commodity prices such as oil. Further challenges could also be attributed to the global financial crisis during the period between 2007 and 2009, at the height of the crisis, economic cycles were particularly influenced by the macro-economic conditions. Business cycles often affect various economic

units' cash flows and the credit portfolio performance (Yiping, 2008). To mitigate the effect of these risks' Kenyan firms, use a variety of hedging practices. Wanja (2005) for example found out that Kenyan firms use futures, swaps, options and forward contracts to hedge against interest rate risk. However, firms in Kenya are hampered by institution policies and market trading platform technology (Otsyula, 2014).

The effect of hedging on firm's performance in Kenyan context is not clear. To comprehensively understand the effect of hedging on the performance of Kenyan firms, it's prudent to cover non-financial and financial firms from all economic sectors in Kenya. This is because the effect of hedging on firm performance depends on the industry and firm size among other factors (Bodnaret al., 2003). Firms listed in the Nairobi stock Exchange (NSE) provides an exhaustive presentation of firms from nonfinancial and financial firms. The firms are also from different sector of the economy. Firms listed in the Nairobi stock Exchange are 63. The firms are categorized into ten groups namely; Agricultural firms, Commercial and Services firms, Telecommunication and Technology firms, Automobiles and Accessories firms, Banking firms, Insurance firms, Investment firms, Manufacturing and Allied firms, Construction and Allied firms and Energy and Petroleum firms (Nairobi Stock Exchange, 2013). The above literature evident that unlike developed countries which commonly use derivate markets as tool for risk mitigation, third world economies prefer minimal use of futures, forwards and swaps for risk mitigation and opt for insurance as to minimize risk (Murungi, et al., 2014; Blaaw, 2008). South Africa being the only African country using derivatives in hedging gold production uses it only for short term contracts. Deutsche Borse Group (2014) noted that use of derivatives enabled elimination of uncertainty and reduction of market risk, therefore may explain the resilience portrayed by developed economies in terms of the structure of their capital markets. However,

like other emerging economies, Kenya is characterized by shallow and undeveloped financial markets. Use of hedging instruments such as derivatives is not fully developed in Kenya and is hindered by political environment, participants' attitude, managerial skeptism, financial infrastructure and foreign competition (Murage, Murungi & Wanjau, 2014). Thus, firms in Kenya find it hard to use hedging instruments against the necessary market microstructure. Firms also find it difficult in pricing and valuing hedging instruments. Since hedging has a cost, firms must carefully evaluate the costs of hedging in light of the costs of not hedging. This can only happen where accurate forecasting and risk assessment is possible. If the expected risk does not materialize, hedging will prove an ineffective way of doing business (Giddy, 2013). In Kenya today firms have recorded mixed results depending on the techniques they use to hedge against risk they face. This study focuses on interest rate,hedging, non-interest income and financial performance of commercial banks listed at Nairobi Securities exchange.

Jorion (2006) examined the correlation of market risk capital charges and trading revenues across eleven large U.S. banks. The findings of this study revealed that these banks had a fairly diversified exposure profile of financial risk. O'Brien and Berkowitz (2006), using the trading profit and loss data. The study results showed significant exposure heterogeneity across dealers. Many hedging funds and banks do not take simple directional trades against broad market risk factors. Instead, their trades tend to be spread trades between related securities, and these risk exposures would not be visible unless a financial risk stress test is conducted. A concern exists about the breakdown of effective CCRM, this indicate that the apparent profits to be earned in this business may create competitive pressures that weaken credit risk mitigation practices. Bernanke (2006) and the Financial Stability Forum (2007), for example, discuss how competition for new hedge fund and hedging in business may be eroding CCRM, through lower

than appropriate fees and spreads, or inadequate risk controls such as lower initial margin levels, collateralization practices, or exposure limits. while this is not a market failure per se, for instance the U.S. banking sector has a history of periods in which laxed CCRM contributed to substantial credit losses and potential systemic consequences but for the less developed countries it was the debt crisis of the late 1970s and early 1980s; excessive commercial real estate lending in the late 1980s. this was possibly due to the weak counterparty credit measures in the 1990s that allowed Long-Term Capital Management (LTCM) to take on enormous leverage in many markets; and most recently the subprime mortgage market. This deterioration may partially reflect inefficient compensation schemes and short horizons of lenders, although some portion of the adverse outcomes simply reflects the underlying, negative shocks.

A complicating factor, however, is that competition and expected profit typically improve efficiency and erode economic rents by inducing entry. This makes it more difficult for outside industry observers to assess whether claims of competitive excess are real or the complaint of incumbents whose profits are being eroded by competition. This type of competition may actually be socially efficient if earlier margins, for example, were "too high" and unduly restricted activity. The economics literature has revealed very little on the interaction of competition and risk management discipline on practices such as initial margin levels. This is because relevant data are not available, for example, on the distribution of dealers' hedge fund and hedging in business by counterparty risk class, how it has changed, how measures of hedging and hedge fund creditworthiness vary across dealers, and how they relate to potential future exposure and risk mitigation practices such as initial margin. This remains an important question for research in which this study is anchored.

The views that reflect the thinking around the intervention during the collapse of Long-Term Capital Management (LTCM) in the fall of 1998. In the US the Federal Reserve Bank of New York President William J. McDonough (1998), in congressional testimony after the LTCM collapse, stated: "there was a likelihood that a number of credit and interest rate markets would experience extreme price moves and possibly cease to function for a period of one or more days and maybe longer. Most importantly, this would lead to further increases in the cost of capital to American businesses." Presumably, the increase in the cost of capital would have led to a reduction in credit provision and real activity in the sector suffer.

In this McDonough's testimony explicitly state that financial losses associated with asset price declines or failed trading strategies were not enough to motivate an intervention; rather, the concern was for "other market participants like investors who had no dealings with Long-Term Capital." This type of impact, either through direct exposures of particular intermediaries or broader disruptions to financial markets, provides a useful framework for discussing and addressing the systemic risk as an "externality," which is a classic rationale for government intervention or regulated interventions in the banking sector. An important point is that the optimal level of systemic risk is not zero. A regulator, in principle, could eliminate all systemic risk by imposing sufficiently stringent limits on leverage or balance sheet linkages, or by imposing severe operating restrictions on key financial intermediaries, but this would unduly curtail the efficient activities of the financial sector and would be suboptimal from a social perspective. Without a fully developed model of the benefits of financial markets and the costs (and origins) of systemic risk, it is obvious that we cannot determine the optimal level of systemic risk, but it can be stressed that concerns should focus on "inefficient" systemic risk that exceeds the socially optimal level.

Reviewed literature on the concept of financial hedging and firm performance; the interest rate Parity Theory is based on the assumption that difference in interest rates between a country and other countries that are its trading partners account for the volatility in the nominal interest rate. Interest rate parity relates to the difference in interest rate between that foreign countries' and domestically. Parity condition provides that interest rate differentials in two different currencies is reflected in premium or discount for the forward exchange rate on the foreign currency whereby there is no financial activity of buying and selling of currency in the financial market (Bhole & Dash, 2002). Further the Liquidity Preference theory asserts that economic units have a preference for liquidity over investing. Applying this theory, it explains the premium offered in forward rates in comparison to expected future spot rates. This premium is used as payment for the use of scarce liquid resources. The preference for liquidity is accounted for by the fact that economic units need to hold certain levels of liquid assets for purchase of goods and services and the fact that these near term future expenditures can be difficult to predict.

The Option Pricing Theory entails how options are valued in the market. The theory is composed of two models Black-Scholes model and Binomial model. Black-Scholes is the most common option pricing theory of European options given that it is designed to value options that can be exercised only at maturity of an underlying assets that do not pay any dividends. Binomial model however is a common option pricing theory of American options in the sense that it is designed to value options that can be exercised at any time regardless of the period let to maturity of an underlying asset. Moreover, the Fishers effect theory of interest rate established that nominal rate is the sum of the real interest rate and inflation rate. Fishers' theory of interest rate provides a rationale of monetary policy focusing on management of inflation so as to stabilize interest rate levels as well as protect the purchasing power of wealth (Tymoigne, 2006). In interest to the

study, interest rates charged on investment is influenced by levels of inflation facing the economy of a country. Volatile conditions may lead to loses whereas stabilization may reduce on default risk as well as enable the realization of return on investment. According to Judge (2002) hedging has several benefits to the hedging firm. The author explains that hedging reduces the expected corporate tax liability for a firm with a convex corporate tax schedule; it lowers the probability of the firm encountering financial distress which in turn lowers the expected costs of financial distress; reduces the risk imposed on the firm's managers, employees, suppliers, and customers; can control the conflict of interest between bondholders and shareholders, thus reducing the agency costs of debt; and hedging facilitates the financing of investment projects using internal funds and so decreases the reliance on costly external financing. Several studies have analyzed the impact of the use of exchange rate hedging on firm value.

Allayannis and Weston (2001) confirmed the existence of a positive and significant relation between the use of currency derivatives and firm value for a sample of American firms. The authors found a nearly 4.87% hedging premium. A study by Carter et. al., (2006) on effect of commodity price hedging by American airline companies showed that hedging with relation to oil prices in the airlines industry is positively related to firm value and the hedging premium reaches over 5%. The authors showed evidence that the greatest benefit of hedging in this sector would be the reduction in underinvestment costs because the fuel price is highly correlated to the investment opportunities in the sector. The study also showed that firms can survive from following appropriate hedging strategies where the “intensity” of hedging is positively associated with the firm value. Otsyula (2014) investigated challenges facing the use of financial derivatives in hedging interest rate risk by commercial banks in Kenya. The study investigated five commercial banks two big banks, one medium and two small banks as per Central Bank of

Kenya commercial banks classification. According to the results from the effort by commercial banks in Kenya to employ the use of derivatives for purposes of hedging against interest rate risk, are mainly hampered by the financial institution policy and market trading platform technology. Though the Central Bank of Kenya has adequate structures at hand to hedge interest rate risk using derivatives among commercial banks in Kenya, the banks' financial institution policies and trading platforms hampered the hedging interest rate risk using financial derivatives. Brodsky (2010) noted that participants in the stock market utilized stock futures and options in respect to their portfolio strategies. The researcher however found out that futures stock market compared to that of other financial derivatives such as interest rate, stock index futures and options led to positive growth and liquidity of underlying stock market. Though the study focused on two financial derivatives, it does show a relationship between equity hedging practices and firm performance. PWC (2012) in their survey found out equity prices was one of the most areas that managers considered to be part of market risk. Gutierrez (2003) in his study identifies that the central bank plays an intervening role in the economy of a country due to its autonomy i.e political and economic independence. The researcher points out that the political independence of the central bank enables it to resist governmental pressures which would otherwise increase fiscal effects such as the "burden of debt" or even economic slowdown because of lower tax receipts. The economic independence of central bank enables it foresee reduction of deficits arising from supply and demand of money in a country by forcing the government to reduce the deficit without necessarily printing more money, which may have an endogenous effect on the country's economy. Goselin (2007) found no statistical evidence of relationship between central bank performance and the degree of financial market development. However, in line with Krause and Rioja (2006), found similarity in the sense that the strength of

the private banking sector was positively correlated with meeting targets more consistently, since the soundness and financial strength of private banks are both negatively correlated with inflation deviations. Reviewed studies have also shown mixed association between hedging and firm performance. For instance, Allayannis and Weston (2001) and Carter et al., (2006) shows that hedging have a positive effect on firm's performance. On the other hand Fauver and Naranjo (2010); Dhanani et al., (2007); Bodnaret al.,(2003) show that hedging does not necessarily have a positive association with performance but depends on a country, industry and corporate governance of the company.

2.4 Conceptual Framework

The study's conceptual framework comprises of the dependent and independent variables that explains the various relationships in the study (Morariu, 2007). This study's conceptual framework is based on the relationship between interest rate models, non-interest income sources and financial performance of listed commercial banks. Interest rate policies form effect moderators on the interest income sources which form independent variables while the financial performance of listed commercial banks forms the dependent variable. The interest rates reviewed by this study are CBK Rates, Interbank Rates and REPO rate. As presented in the figure conceptualized below.

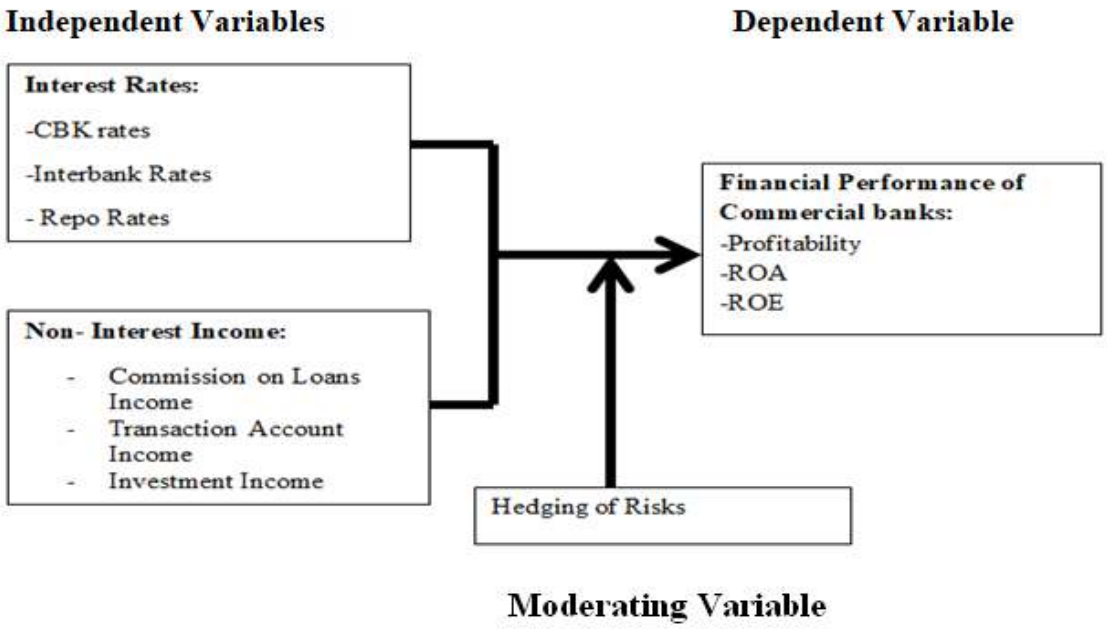

Fig. 2.1 Conceptual Framework

CBR rate have been found by various scholars such as Muriuki (2013) and Matemilola et al. (2015) to positively affect profitability hence performance of commercial banks. While other literature such as European Central Bank (2013) and Illes et al. (2015) suggest no relationship

between CBR rate and commercial bank rates hence performance. They suggest that the central bank is not the major supplier of funds for commercial banks and as a result changes in the CBR rate do not affect the activities by commercial banks. This reflects conflicting results. Thus this area is subject to further research to find out whether CBR rate affect the financial performance of commercial banks through the non interest income sources. Different scholars such as Brauning and Fecht (2012), Kelilume (2014) and Kamaan (2014) have found a positive and significant relationship between inter-bank rates and the performance of commercial banks. Wang et al. (2012) on the other hand suggested that the relationship is weak due to other factors such as the risk faced by commercial banks. This study however, will establish whether inter-bank rates have an effect on the relationship between bank transaction account charges as sources of non-interest income and financial performance of commercial banks.

Garleanu and Pedersen (2010), Vanitha et al. (2013), Mandel and Tomsik (2014), Dunne et al. (2014) and Fecht et al. (2015) have found Repo rates very crucial on the performance of commercial banks. However, this study determined whether policies on Repo had any effect on the relationship between investment income and financial performance of commercial banks. The performance of commercial banks in Kenya has also been shaky with some of the banks being put under receivership. This study established whether this has been as a result of changes in the interest rate and non-interest income; Commissions on loans and advances are expected to be determined by the set out interest rates on loans as determined by the Central Bank Base rate and the volume of loans. Further foreign exchange trading income was also expected to be determined by that the volatity of the exchange markets and the margins determined the value of income received from this stream. The investment income is highly affected by investment in mutual funds, insurance underwriting and companies that the banks choose to invest in and their dividend payout strategies. Finally, transactional and account related income can be determined by volumes of accounts, fees on services rendered by banks, ATM transactions, agency banking and mobile and internet banking fees.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlined the methodology adopted for the study. The techniques and the procedures used in the study are presented in this section. The chapter therefore highlights on the research philosophy, research design, research area, Target population, sample size, sampling frame, data collection, research instrumentation, data analysis and presentation.

3.2 Research Philosophy

A research philosophy is a belief about the way in which data about a phenomenon should be gathered, analyzed and used. Two major research philosophies can be identified, namely positivist (sometimes called scientific) and interpretivism (anti-positivist) this is according to Galliers (1991). Positivists believe that reality is stable and can be observed and described from an objective viewpoint (Levin, 1988), without interfering with the phenomena being studied. The beginning of designing a research is the specification of research paradigm after defining the topic of concern. Research paradigm is a broad view or perspective of a study (Taylor *et al.*, 2006) or patterns of beliefs and practices that regulate inquiry within a discipline by providing lenses, frames and processes through which investigation is accomplished (Weaver and Olson, 2006). Dill and Romiszowski (1997) advanced the importance of research paradigm.

The positivist position is derived from that of natural science and is characterized by the testing of hypothesis developed from existing theory, hence deductive or theory testing through measurement of observable social realities. This position presumes the social world exists objectively and externally, that knowledge is valid only if it is based on observations of this external reality and that universal or general laws exist or that theoretical models can be

developed that are generalizable, explain cause and effect relationships, and in predicting outcomes. Positivism is based upon values of reason, truth and validity and with a focus purely on facts, gathered through direct observation and experience and measured empirically using quantitative methods like surveys and experiments and statistical analysis (Blaikie, 1993; Saunders, Lewis and Thornhill, 2007; Eriksson and Kovalainen, 2008; Easterby-Smith, Thorpe and Jackson, 2008; Hatch and Cunliffe, 2006). A research paradigm structures the world of the academic worker and provides its meaning and significance. The philosophy of critical realism focuses on explaining what we see and experience, in terms of the underlying structures of reality that shape the observable events. Critical realists, express that the reality is the most important philosophical consideration, a structured and layered ontology being crucial (Fleetwood 2005). They see reality as external and independent. This study was guided by quantitative positivism paradigm, since it is an inquiry based on testing of a theory, is composed of variables measured with numbers and to be analyzed with statistical procedures in order to determine whether the predictive generalizations of the theory held are true (Cresswell, 2003).

3.3 Study Area

This study was based in Nairobi, Kenya. Nairobi is where headquarters of most commercial banks are physically located, being the capital city of Kenya. The study was conducted at the offices of the commercial banks where all pertinent information were obtained.

3.4 Research Design

Research design is a plan and structure of investigation aimed at obtaining answers to research problem (Cooper & Schindler, 2008). The aim of a research design is to control the experimental, extraneous and error variables of a particular research problem being investigated. Burrell and Morgan (1979) reveal that research design can have the extremes of objectivism and

subjectivism, that is, the 'sociology of regulation' and 'sociology of radical change'. Researchers working within the regulation perspective are concerned primarily with the need for the regulation of societies and human behaviour. They assume an underlying unity and cohesiveness of societal systems and structures. In this context, much of business and management research can be classed as regulation research that seeks to suggest how organizational affairs may be improved within the framework of how things are done at present rather than radically challenging their current position.

Therefore, this study adopted a cross-sectional survey research design. This design is deemed suitable for establishing the relationship of the problem variables, determine whether and to what degree a relationship exists between the quantifiable variables in this study and this concurs with past studies (Mugenda and Mugenda, 2003; Cooper and Schindler,2003; and Nachmias and Nachmias, 2008). Research design is the blue print for the collection, measurement and analysis of data (Kothari, Ramanna, & Skinner, 2010). The design connects the questions or objectives of the study to the data gathered. According to Elahi and Dehdashti (2011), cross-sectional survey descriptive research is used when the research objective is to portray the characteristics of a social phenomenon and determining the frequency of occurrence. Thus, the design was therefore ideal since it aimed at bringing out the interest rates, hedging and non-interest income constructs relationship with financial performance of commercial banks listed in the NSE.

3.5 Target Population

The study unit of analysis was the commercial banks listed in Nairobi Securities Exchange. Kothari (2004) describes a target population as the sum of respondents in a field that the researcher is interested in. On the other hand, Mugenda and Mugenda (2003) describe a target population as the population to whom the research findings can be generalized. Commercial banks listed at the NSE were the targeted population for this study. According to the NSE Report (2022), there are a total of 11 commercial banks listed. The banks as shown in Table 3.1.

Table 3.1: Sample Frame

BANK	Number
ABSA of Kenya	1
Equity Bank Limited	1
Kenya Commercial Bank Limited	1
Standard Chartered Bank Limited	1
Co-operative Bank of Kenya Limited	1
CFC Stanbic Holdings Limited	1
Diamond Trust Bank Kenya Limited	1
I&M Holdings Ltd	1
National Bank of Kenya Ltd	1
NIC Bank Ltd	1
Housing Finance Co Ltd	1
Total	**11**

Source: CBK (2022)

3.6 Sample Design

Manion (2001) observes that the quality of a research is largely dependent on the appropriateness of the research methodology, data collection instrument and the suitability of the sampling strategy used. Gaya (2003) and Babbie (2005) notes that the most appropriate sample size for a descriptive study is between 10% - 30% of the total population. However, in this study there are only a total of 11 commercial banks operating at the NSE. This implies that the population was small and therefore the study adopted a census where all the banks was considered.

3.7 Data Collection Procedure and Research Instruments

The study used secondary data which was collected using the document analysis guide from both individual banks financial statements and the Central Bank's database. Data on financial performance was extracted from the audited financial statements of the commercial banks while

data on CBK rate, Repo rate and interbank rate was downloaded from the Central Bank of Kenya website. The data was collected over a period between 2000 and 2021. The data collected was cross-checked against data from Capital Markets Authority and other scholarly journals and relevant newspapers. Secondary data is very useful when evaluating historical performance of an organization (Cooper & Schindler, 2003). Further, Mugenda and Mugenda (2003) observe that numerical figures extracted from reports, statements and budgets can be an important source of secondary data.

3.7.1 Validity of Research Data

Ogula (1998) observes that data validity is the measure of research instrument's accuracy when measuring variables of the study. Data validity is used to indicate whether the research instrument really measures what it purports to measure. The data collection guide was subjected to thorough and logical evaluation process in order to ensure that the collected data is valid. This was done with the help of peer and expert review of the data collection guide.

3.7.2 Reliability of the Research Data

Data Reliability refers the consistency of the research findings if the same data is subjected repeated trials. A research instrument is deemed reliable if it outputs consistent results even after repeated trials (Mugenda & Mugenda, 2003). The reliability of the variables was established and results presented in table 3.2 below

Table 3.2 Reliability Analysis

Variable	Items	Cronbach Alpha (α)	Comment
Central Bank Rates	10	0.820	Reliable
Interbank Rates	10	0.868	Reliable
Repo rates	10	0.808	Reliable
Hedging	10	0.794	Reliable
Commission on Loans Income	10	0.855	Reliable
Transaction Account Income	10	0.826	Reliable
Investment Income	10	0.821	Reliable

The result in table 3.2 indicate that the variables used in the study were reliable and could produce consistent results.

3.8 Data Analysis and Presentation

The secondary data collected was analyzed with the help of the Statistical Package for Social Sciences (SPSS) for analysis to generate descriptive statistics such as means and standard deviations and presented in form of graphs, tables, percentages and bar charts. Correlation analysis and regression analysis was used to explain the relationship between interest rates, interest income and financial performance of listed commercial banks at 95% confidence level. Noteworthy, regression model enables us to assess easily if there is a linear relationship between the variables and further assess the size of the relationship. It further allows us to observe if the relationship remains constant after inclusion of additional variables in the regression model. Lastly the regression analysis is key in performing a statistical test if the relationship between the variables can be generalized to the larger population. Thus, the study used multiple regression models as outlined below;

$$Y = \beta 0 + \beta_1 X_{1it} + \beta_{11}\ CBR_{it} + \beta_2 X_{2it} + \beta_{22}\ IBR_{it} + \beta_3 X_{3it} + \beta_{33}\ REPOR_{it} + \beta_4\ RIS\text{-}HEDG_{jt} + \varepsilon \quad \ldots\ldots (3.1)$$

$$Y_1 = \beta 0 + \beta_1 X_1 + \beta_{11} CBR_i + \varepsilon \quad \ldots\ldots (3.2a)$$

$$Y_1 = \beta 0 + \beta_1 X_{1it} + \beta_{11} CBR_{it}\ RIS\text{-}HEDG_{jt} + \varepsilon \quad \ldots\ldots (3.2b)$$

$Y_2 = \beta 0 + \beta_2 X_{2it} + \beta_{22} IBR_{it} + \varepsilon$ …….…… (3.3a)

$Y_2 = \beta 0 + \beta_2 X_{2it} + \beta_{22} IBR_{it}$ RIS- $HEDG_{jt} + \varepsilon$ …… (3.3b)

$Y_3 = \beta 0 + \beta_3 X_{3it} + \beta_{33}$ $REPOR_{it} + \varepsilon$ ……..…….. (3.4a)

$Y_3 = \beta 0 + \beta_3 X_{3it} + \beta_{33}$ $REPOR_{it}$ RIS-$HEDG_{jt} + \varepsilon$ …….. (3.4b)

$Y = \beta 0 + \beta_1 X_{1it} + \beta_{11}$ CBR_{it} RIS-$HEDG_{jt} + \beta_2 X_{2it} + \beta_{22}$ IBR_{it} RIS-$HEDG_{jt} + \beta_3 X_{3it} + \beta_{33}$ $REPOR_{it}$ RIS- $HEDG_{jt} + \varepsilon$ ……....…….…… (3.5)

Where:

Y= Dependent Variable (financial Performance- Volume of EAITBDA).

X_1= Volume of Commissions on Loans

X_2= Volume of Transactions Account Income

X_3= Volume of Investment Incomes

CBR_i= Central bank rates (over time t= 1, 2, …n)

IBR_i= interbank rates (over time t= 1, 2, …n)

$REPOR_i$= Repo rates (over time t= 1, 2, …n)

RIS-$HEDG_j$ = Hedging Mitigation (Risk estimation Metrics) over time j= 1, 2, …n)

$\beta_0, \beta_1, \beta_{11}, \beta_2, \beta_{22}, \beta_3, \beta_{33},$ and β_4 are regression equation coefficients

ε = error term of the regression

3.8.1 Diagnostic Tests

3.8.1.1 Multicollinearity

The VIF was established. This is an index which measures how much variance of an estimated regression coefficient is increased. Rule of Thumb was applied: If any of the determined VIF values exceeds 10, it implies that the associated regression coefficients are poorly estimated and multicollinearity exist (Montgomery, 2001; Murphy and Myors, 1998). Therefore, this

multicollinearity was deemed not severe to interfere with the relationship between independent variables and dependent variable if the VIF values fall within the expected ranges.

3.8.1.2 Normality Distribution Test

A normality test determines whether a sample data has been drawn from a normally distributed population. It is generally performed to verify whether the data involved in the research have a normal distribution. In this study skewness and kurtosis statistics were used.

3.8.1.3 Autocorrelation Test

Autocorrelation refers to the degree of correlation of the same variables between two successive time intervals. It measures how the lagged version of the value of a variable is related to the original version of it in a time series. The Durbin Watson statistic is a test for autocorrelation in a regression model's output. The statistic ranges from zero to four, with a value of 2.0 indicating zero autocorrelation. Values below 2.0 mean there is positive autocorrelation and above 2.0 indicates negative autocorrelation.

3.8.1.4 Ethical Considerations

This study adhered to the four ethical tenets in social science of informed consent, deception, privacy and confidentiality and accuracy (Clifford, 2000). The researcher obtained research authorization from the Research Ethics Review Committee, JOOUST as the first issue. The protocol was also approved by the Ministry of Higher Education, Science and Technology through the National Commission for Science, Technology and Innovation (NACOSTI),

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis, interpretation and discussion of results generated from data collected from the field and presentations done objective by objective.

4.2 Descriptive Statistics

The study established the descriptive statistics of the data used. A normality test determines whether a sample data has been drawn from a normally distributed population. It is generally performed to verify whether the data involved in the research have a normal distribution. The values in this study were normalized using the natural logarithms (Ln) of the large figures obtained from the field for easy analysis and interpretation. The standard deviation, skewness and kurtosis of the variables results are shown in table 4.1 below

Table 4.1a: Descriptive Statistics: Testing for Normality of Variables

	Mini.	Maxi.	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
LnX_1	.01035	.09910	.0216247	.01428358	3.705	16.287
Ln X_2	.61202	.68567	.6579314	.01797640	-.737	.106
Ln X_3	.09950	.14980	.1330789	.01243477	-1.120	.908
ROA	.02017	.02875	.0237577	.00205199	.053	-.750

The results in table 4.1 indicate that the natural logarithms (Ln) of X_1 (CBR*NII) commission on loans income product with the central bank rate had a standard deviation of .01428358 with skewness statistic of 3.705 and kurtosis statistic of 16.287. This variable has the highest values of skewness and kurtosis. This variable shows Cauchy distribution which is symmetric with heavy tails and a single peak at the center of the distribution. Due to the heavier tails the kurtosis is

larger than for the normal distribution. The natural logarithms (Ln) of X_2 (IBR*NII) on the transactions account income product with interbank rate had the highest standard deviation (0.01787640) and is normally distributed at skewness statistic of -0.737 and kurtosis statistic of 0.106. For the natural logarithms (Ln) of X_3 (IBR*NII) which is the investment account income product with repo rate has a standard deviation of 0.01243477 with skewness and kurtosis statistic of -1.120 and 0.908 respectively indicating a normal distribution of the variable data. Further, return on assets (ROA) ratio had standard deviation of 0.00205199 with skewness and kurtosis statistic of 0.053 and -0.750 respectively indicating also a normal distribution of the data. The standard deviations of individual variable values are not very high but are around the mean statistic of the variable construct.

4.2b Diagnostic Tests

Before the regression model results were obtained post estimation analysis and pre estimation analysis tests were performed. The pre-estimation analysis tests performed include the unit root tests and multicollinearity. The post estimation analysis tests include the normality test, test for test for autocorrelation and heteroskedasticity. This helps to avoid spurious regression results from occurring.

4.2b (i) Test for Multicollinearity

According to William et al. (2013), multicollinearity occurs when there is correlations presence among the predictors. In some cases of perfect correlations among the predictor variables, multicollinearity may imply that unique least squares solution should not be computed to a regression analysis (Field, 2009). Multicollinearity increases the confidence intervals and standard errors which may lead to estimates that are unstable of the coefficients for the individual predictors.

Table 4.1.1 Test for Multicollinearity using VIF

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Central Bank Rates	.477	2.098
Bank Commissions on Loans	.477	2.098

The results in table 4.1.1 show that the Variance Inflation factor values (VIF = 2.098) in this study are below 10 and therefore severe multicollinearity does not exist.

Table 4.1.2 Test for Multicollinearity using VIF

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Interbank Rates	.231	4.326
	Transaction Account Income	.231	4.326

The VIF value is an index which measures how much variance of an estimated regression coefficient is increased. Rule of Thumb is applied in this study: If any of the determined VIF values exceeds 10, it implies that the associated regression coefficients are poorly estimated and multicollinearity exist (Montgomery, 2001; Murphy and Myors, 1998). Therefore this multicollinearity is deemed not severe to interfere with the relationship between independent variables and dependent variable if the VIF values fall within the expected ranges. The VIF values (VIF = 4.326) in this study are below 10 and therefore severe multicollinearity does not exist.

Table 4.1.3 Test for Multicollinearity using VIF

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Investment Income	.859	1.164
	Repo rate	.859	1.164

The VIF values (VIF = 1.164) in this study are below 10 and therefore severe multicollinearity does not exist. The failure to identify and report multicollinearity could result in misleading interpretations of the results. The statistical literature emphasizes that the main problem

associated with multicollinearity includes unstable and biased standard errors leading to very unstable p-values for assessing the statistical significance of predictors, which could result in unrealistic and untenable interpretations.

Table 4.1.4 Test for Multicollinearity using VIF

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	X_1	.049	20.227
	X_2	.134	7.467
	X_3	.982	1.019
	CBR* RIS-HEDG	.160	6.265
	IBR *RIS-HEDG	.042	23.991
	REPOR *RIS-HEDG	.250	4.000

The VIF value is an index which measures how much variance of an estimated regression coefficient is increased. Rule of Thumb is applied in this study: If any of the determined VIF values exceeds 10, it implies that the associated regression coefficients are poorly estimated and multicollinearity exist (Montgomery, 2001; Murphy and Myors, 1998). Variance inflation factor is used to measure how much the variance of the estimated regression coefficient is inflated if the independent variables are correlated. The value of VIF =1 indicates that the independent variables are not correlated to each other. If the value of VIF is 1< VIF < 5, it specifies that the variables are moderately correlated to each other. The challenging value of VIF is between 5 to 10 as it specifies the highly correlated variables. If VIF ≥ 5 to 10, there will be multicollinearity among the predictors in the regression model and VIF > 10 indicate the regression coefficients are feebly estimated with the presence of multicollinearity.

4.3 Central Bank Rates, Bank Commissions on Loans Income, Hedging and Financial Performance of Banks listed at the Nairobi Securities Exchange

The study establishes the influence of Central Bank Rate on the relationship between bank commissions on loans income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The results in table 4.1 reveal that a strong and positive association with a significant relationship exist between the central bank rates, commission on loans and financial performance of the banks ($R = .874^a$, $R^2 = .764$, $p < .005$); these variables explained up to 76.4% of the variation in banks financial performance.

Table 4.1 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			Durbin-Watson
					R Square Change	F Change	Sig. F Change	
1	.874[a]	.764	.733	104919510.86	.764	24.336	.000	1.786

a. Predictors: (Constant), Bank Commissions on Loans, Central Bank Rates

b. Dependent Variable: Performance

The study established the fitness of the variables in the model used in this study was up to 73.3% (adjusted R^2 = .733; F = 24.336, P = .000[b]). This results in table 4.2 indicate that the model can be relied on up to 73.3% in predicting financial performance of the banks.

This study results concur with findings of Chiorrazzo et al. (2008) study on the link between non-interest revenues and profitability using data from a sample of Italian banks for the period 1993 to 2003. There is evidence that income diversification increases risk-adjusted returns. In addition, the findings also indicate that there are limits to the diversification gains which can be achieved as banks get larger. Additionally, results showed that small banks can make gains from increasing non-interest income, but this is premised on these institutions having an initially low non-interest income share.

The findings in this study concurs with past studies on interest rate which is the price a borrower pays for the use of money they borrow from lender or financial institutions or fee paid on borrowed assets (Crowley, 2007). Theoretically, there exist a relationship between inflation, central bank rate and the profitability of firms, since inflation can influence the central bank rate which directly influences the cost of capital and the return on savings. A change in interest rate affects the debt equity choice of a firm; Hualan (1992) found that interest rate is one of the most

important factors that affect the overall bank financial performance. Interest rates are major economic factors that influence the economic growth in an economy. Corb (2012) study argued that interest rate is an economic tool used by Central Bank of Kenya (CBK) to control inflation and to boost economic development, the rationale behind the need to control interest charged on credit or any financial instruments is based on the need to control economic patterns that has great effects to the entire economy. Howells (2008) study reveal that increase in interest rates makes savings from current income more attractive, increases repayment of existing floating - rate debt and thus lowering disposable income, with possible loan default; increases the cost of goods obtained on credit; lowers the prices of financial assets and hence influence estimates of private sectors wealth and lowers house prices.

Table 4.2 ANOVA[a]

Model		Sum of Squares	Mean Square	F	Sig.
1	Regression	535782606513570880.000	267891303256785440.000	24.336	.000[b]
	Residual	165121556409725344.000	11008103760648356.000		
	Total	700904162923296260.000			

a. Dependent Variable: Performance

b. Predictors: (Constant), Bank Commissions on Loans, Central Bank Rates

ANOVA is an analysis tool used in statistics that splits an observed aggregate variability found inside a data set into two parts: systematic factors and random factors. The systematic factors have a statistical influence on the given data set, while the random factors do not. The F value (F= 24.336) is used in analysis of variance (ANOVA). It is calculated by dividing two mean squares. This calculation determines the ratio of explained variance to unexplained variance. The F distribution is a theoretical distribution. The F-statistic is simply a ratio of two variances. Variances are a measure of dispersion, or how far the data are scattered from the mean. Larger values represent greater dispersion.

The results in table 4.3 indicate that bank commissions on loans unit increase causes 0.671 unit increase in banks financial performance. While central bank rates unit increase causes 90679092.591 increase in financial performance of banks.

Table 4.3 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	518289032.827	274283131.149		-1.890	.078		
	Central Bank Rates	90679092.591	31598886.114	.521	2.870	.012	.477	2.098
	Bank Commissions on Loans	.671	.290	.420	2.315	.035	.477	2.098

Substituting the coefficients in the model:

$Y_1 = \beta 0 + \beta_1 X_1 + \beta_{11} CBR_i + \varepsilon$ ……. (3.2);

the results reveal that $Y_1 = 518289032.827 + .671X_1 + 90679092.591CBR_i$. The coefficients indicate the nature of association of the variable in the model. Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients b_0, b_1, and b_{11}, relating to independent variables towards banks financial performance. For the constant $b_0 = -518289032.827$; $T_0 = -1.890$, the *p* values (p 0.078 > 0.05) reject H_0 and conclude that $b_0 = -518289032.827$ is not significantly different from zero. For bank commissions on loans its $b_1 = - 0.671$; $T_1 = 2.315$> critical value (1.734064), p =0.035 < 0.05): the study rejects H_0 and conclude that b_1 is significantly different from zero and is statistically significant, therefore effect of bank commissions on loans on the banks financial performance was not zero. For central bank rates its $b_{11} = 90679092.591$; $T_{11} = 2.870$> critical value (1.734064), p= 0.012< 0.05): the study rejects H_0 and conclude that b_{11} is significantly different from zero and is statistically significant, therefore effect of central bank rates on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis

stated as: There is no significant effect of Central Bank Rate (CBR) on the relationship between bank commissions on loans income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The variable central bank rate was statistically significant.

The VIF value is an index which measures how much variance of an estimated regression coefficient is increased. Rule of Thumb is applied in this study: If any of the determined VIF values exceeds 10, it implies that the associated regression coefficients are poorly estimated and multicollinearity exist (Montgomery, 2001; Murphy and Myors, 1998). Therefore this multicollinearity is deemed not severe to interfere with the relationship between independent variables and dependent variable if the VIF values fall within the expected ranges. The VIF values (VIF = 2.098) in this study are below 10 and therefore severe multicollinearity does not exist. These results concur with past studies; there is widespread empirical support that lower interest rates are associated with a decline in banks' net income margin. However, there is less agreement on the impact of monetary policy on overall bank profitability as well as the impact of negative rates. Starting with the impact on banks' interest margins, several studies identify a nonlinear relationship between interest rates and net income margin, with the marginal impact of a cut to the cash rate larger in low interest rate environments (Borio et al (2017). A prolonged period of low rates is also found by several studies to have a larger negative effect on margins than a relatively short period (Claessens et al,2018). While studies by Genay and Podjasek (2014) and Bikker and Vervliet (2018) both find that interest rates have a negligible effect on banks' profitability, mainly because higher fees and lower LLPs offset downward pressure on net income margins.

The study further analyzed the relationship between the Central Bank Rates, bank Commissions on loans income, hedging and financial performance of Commercial banks listed at NSE.

Table 4.3a: Model Summary[b]

Model	R	R Square	Adjusted R Square	Change Statistics	
				R Square Change	Sig. F Change
1	.734[a]	.539	.533	.533	.000

a. Predictors: (Constant), Bank Commissions on Loans, Central Bank Rate-Hedging
b. Dependent Variable: Financial Performance

The result in table 4.3a show that (R= .734[a]) there exist a strong association between the explanatory variables and the dependent variable (financial performance of banks). The variables can explain up to 53.9% variation in financial performance of commercial banks (R^2 = .539). Generally, a higher r-squared indicates more variability is explained by the model. However, it doesn't tell whether the chosen model is good or bad, nor will it tell whether the data and predictions are biased. A high or low R-squared isn't necessarily good or bad it doesn't convey the reliability of the model or whether you've chosen the right regression. These variables are reliable in the prediction of financial performance up to 53.3% (Adjusted R^2 = .533) and their influence on financial performance is statistically significant (p = .000). Adjusted R-squared is a modified version of R-squared that has been adjusted for the number of predictors in the model. The adjusted R-squared increases when the new term improves the model more than would be expected by chance. It decreases when a predictor improves the model by less than expected.

Table 4.3bCoefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	82890 3.66	.008	-	8.292	.000
Bank Commissions on Loans (**X_{1it}**)	.681	.017	.556	4.003	.000
Central Bank Rates* Hedging (**CBR_{it} RIS-$HEDG_{jt}$**)	.957	.000	.849	15.882	.000

a. Dependent Variable: Financial Performance

The regression model below was adopted.

$Y_1 = \beta 0 + \beta_1 X_{1it} + \beta_{11} CBR_{it}\, RIS\text{-}HEDG_{jt} + \varepsilon$ …… (4.2)

Substituting the coefficients in table 4.3b to the regression model 4.2 it changes to

$$Y_1 = 828903.66 + 0.681 X_{1it} + 0.957 CBR_{it}\, RIS\text{-}HEDG_{jt}$$

The result in the model indicate that a unit change in bank commissions on loans results in 0.681 units change in financial performance of commercial banks. While the unit change in central bank rates and hedging components causes 0.957 units change in financial performance of commercial banks. This result reveal that CBK rates and hedging when optimized in application in this sector the financial performance improves significantly.

The coefficients indicate the nature of association of the variable in the model. Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients b_0, b_1, and b_{11}, relating to independent variables towards banks financial performance. For the constant b_0 = .660; T_0 = 8.292, the p values (p 0.000 < 0.05) reject H_0 and conclude that b_0 = .660 is not significantly different from zero. For bank commissions on loans its b_1 = .681; T_1 = 4.003> critical value (1.734064), p =0.000 < 0.05): the study concludes that b_1 is significantly different from zero and is statistically significant, therefore influence of bank commissions on loans on the banks financial performance was not zero. For central bank rates, hedging its b_{11} = .957; T_{11} = 15.882> critical value (1.734064), p= 0.000< 0.05): the study concludes that b_{11} is significantly different from zero and is statistically significant, therefore influence of central bank rates-Hedging on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis stated as: There is no significant relationship between of Central Bank Rate- hedging, bank commissions on loans income and financial performance of commercial banks listed at the Nairobi Securities Exchange. These variables were therefore statistically significant.

This findings concurs with study by Nimalathasan, B., and Pratheepkanth, P.(2012) in their topic impact of systematic risk on profitability of selected financial institutions in Sri-Lanka from year 2007 to 2011. In their research, systematic risk was measured. The research used derived statistics. Prepared hypothesis was conducted and the findings showed systematic hazard have optimistic relationship (r=0.755; P =.000<0.05). The study findings showed that systematic

risk is improved by Degree of Financial Leverage and Degree of Operating Leverage in the preferred financial institutions where the beneficial impact is observed on productivity.

Among risk mitigating strategy that is commonly used by firms is hedging. Hedging reduces the risk of future price movements which might affect a firm adversely if not well managed (Horne &Wachowicz, 2012). Hedging is done by a firm or individual to protect against a price change that would otherwise negatively affect profits (Brigham & Ehrhardt, 2014). It provides relatively inexpensive and highly liquid positions similar to those obtained with diversified stock portfolios (Sharpe, Alexander & Bailey 2013). To hedge a firm can use a wide range of financial instruments, including forward agreements, futures contracts, options or swaps, to achieve their hedging goals. Bartram et al. (2011) on a survey of non-financial firms from 47 countries found out that the use of these instruments reduced firm's total risk and is more experienced in firms with higher exposures to interest rate risks, exchange rate risks and commodity prices risks. In United States, 83% of hedging firms use forward agreements, futures contracts, options or swaps to hedge foreign exchange risk, 76% use them to hedge interest rate risk and 56% use them to hedge commodity price risk (Bodnaret al., 2008). It follows therefore that forward agreements, futures contracts, options and swaps are commonly used in hedging interest rate risks, foreign exchange risks, and commodity price risks. The study concurs with findings on the major source of financial risk like the issue of inflation. In the recent past Kenya has experienced one of the worst inflation instances since independence (CBK, 2023). This witnessed the stagnation of numerous projects and upward fluctuation of commodity prices such as oil. Further challenges are attributed to the global financial crisis, at the height of the crisis; economic cycles are particularly influenced by the macro-economic conditions. Business cycles often affect various

economic units' cash flows and the credit portfolio performance. To mitigate the effect of these risks Kenyan firms use a variety of hedging practices.

4.4 Interbank Rate, Transaction Account Income and Transaction Account as Non Interest Income on Financial Performance of Commercial Banks listed at the Nairobi Securities Exchange

The study established the influence of interbank rates on the relationship between transactions account income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The results were presented as in table 4.4 below

Table 4.4 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		Durbin-Watson
					F Change	Sig. F Change	
1	.807[a]	.651	.604	127735331.02922	13.979	.000	1.113

a. Predictors: (Constant), Transaction Account Income, Interbank Rates

b. Dependent Variable: Financial Performance

Information in table 4.4 indicate that a positive and strong association exist between the explanatory variables and banks financial performance (R =0.807[a]). The interbank rates and transaction account income explain up to 65.1% of the variation in bank performance (R^2 =0.651; F =13.979) and the effect is statistically significant (p< .05). The variables in the model can be relied on in the prediction of banks financial performance up to 60.4% (adjusted R^2 = .604), this implies that other variables exist which accounts for 39.6% of the variation in financial performance of these banks.

Table 4.5 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	37906836.556	117894241.073		.322	.752		
	Interbank Rates	104785863.593	42740179.675	.778	2.452	.027	.231	4.326

Transaction Account Income	.249	.238	.033	.103	.920	.231	4.326

a. Dependent Variable: Performance

The results in table 4.5 indicate that a unit increase in interbank rates causes an increase of banks financial performance by 104785863.593 increase while a unit increase in transaction accounts income causes increase of 0.024 in banks financial performance. Substituting the coefficients in the model $Y_2 = \beta 0 + \beta_2 X_2 + \beta_{22} IBR_i + \varepsilon$; the results show that $Y_2 = 37906836.556 + .249X_2 + 104785863.593\ IBR_i$. The findings further reveal that the effect size of interbank rates on financial performance of the banks was significantly high at 77.8% (standardized beta = .778) while the effect size of transaction account income was at 3.3% (standardized beta = .033).

Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients $b_{0,}$ b_2, and $b_{22,}$ relating to independent variables towards banks financial performance. For the constant $b_0 = 37906836.556$; $T_0 = .322$, the *p* values (p 0.752 > 0.05) reject H_0 and conclude that $b_0 = 37906836.556$is not significantly different from zero. For transaction account income its $b_2 = 0.249$; $T_2 = 0.103<$ critical value (1.734064), p =0.920> 0.05): the study fails to reject H_0 and conclude that b_2 is not significantly different from zero and is statistically insignificant, therefore the effect of transaction account income on the banks financial performance was zero. For interbank rates its $b_{22} = 104785863.593$; $T_{22} = 2.452>$ critical value (1.734064), p= 0.027< 0.05): the study rejects H_0 and conclude that b_{22} is significantly different from zero and is statistically significant, therefore effect of interbank rates on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis which stated as: There is no significant influence of interbank rates on the relationship between transactions account income and financial performance of

commercial banks listed at the Nairobi Securities Exchange. The variable interbank rates were statistically significant.

The VIF value is an index which measures how much variance of an estimated regression coefficient is increased. Rule of Thumb is applied in this study: If any of the determined VIF values exceeds 10, it implies that the associated regression coefficients are poorly estimated and multicollinearity exist (Montgomery, 2001; Murphy and Myors, 1998). Therefore this multicollinearity is deemed not severe to interfere with the relationship between independent variables and dependent variable if the VIF values fall within the expected ranges. The VIF values (VIF = 4.326) in this study are below 10 and therefore severe multicollinearity does not exist. The results concur with Stiroh (2004) that banks expand into fees-based solutions and services with a goal of income diversification. But it differs with other scholars Guru et al. (2002) that non-interest income does not directly improve performance of banks.

The study further established the relationship between interbank rates, Hedging, transaction account income and financial performance of commercial banks listed at NSE. The data collected was analyzed and presented as in tables below

Table 4.5a Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			Durbin-Watson
					R Square Change	F Change	Sig. F Change	
1	.849[a]	.720	.717	.04130794	.720	215.252	.000	.066

a. Predictors: (Constant), Interbank Rate-Hedging, Transaction Account Income
b. Dependent Variable: Financial performance

The results in table above reveal a strong and positive association between the Interbank Rate-Hedging, Transaction Account Income and financial Performance (R = .849[a]). This is almost a perfect association between the two variables in this study. It is observed that Interbank Rate-

Hedging, Transaction Account Income can explain upto 72% of the variation in yield of financial performance (r^2 = .720), this explanatory variable Interbank Rate-Hedging, Transaction Account Income can be relied with accuracy and preciseness in the prediction of performance of commercial banks up to 71.7% (adjusted r^2 = .717) and it is statistically significant (p =0.000<0.05). Therefore, the result out of this variable in the model can be relied on in the prediction.

Table 4.5b Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	379066.78	.013		5.973	.000
	Interbank rate-Hedging	.184	.090	1.274	2.036	.021
	Transaction Account Income	1.270	.000	.645	8.360	.000

a. Dependent Variable: Financial Performance

$Y_2 = 379066.78 + 1.270X_{2it} + 0.184IBR_{it}$ RIS- $HEDG_{jt}$ …… (3.3b)

The result in table 4.5b when substituted in the model it indicates that a unit change in bank Transaction Account Income results in 1.270 units change in financial performance of commercial banks. While the unit change in Interbank Rate-Hedging components causes 0.184 units change in financial performance of commercial banks. This result reveal that interbank rates-hedging and Transaction Account income when optimized in application in this sector there occurs significant improvement in financial performance of commercial banks.

The coefficients indicate the nature of association of the variable in the model. Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients b_0, b_2, and b_{22}, relating to independent variables towards banks financial performance. For the constant b_0 = 379066.78; T_0 = 5.973, the p values (p 0.000 < 0.05) reject H_0 and conclude that b_0 = 379066.78is not significantly different from zero. For

bank Transaction Account Income its $b_2 = 1.270$; $T_2 = 8.360$> critical value (1.734064), p =0.000 < 0.05): the study concludes that b_2 is significantly different from zero and is statistically significant, therefore influence of bank Transaction Account Income on the banks financial performance was not zero. For interbank rates-hedging its $b_{22} = 0.184$; $T_{22} = 2.036$> critical value (1.734064), p= 0.026< 0.05): the study conc ludes that b_{22} is significantly different from zero and is statistically significant, therefore influence of Interbank Rates-Hedging on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis stated as: There is no significant relationship between of Interbank Rate-hedging, Transaction Account Income and financial performance of commercial banks listed at the Nairobi Securities Exchange. These variables were therefore statistically significant. This positive relationship between hedging and firm financial performance is supported by the findings of Judge (2002); Weston (2001). Findings by Gutiérrez (2003) identifies central bank controls as an intervening variable, which supports the findings of the study whereby, as a result of mediation of central bank controls the strength of the relationship of the study variables i.e R^2 has increased, which implies that an intervention by a county's central bank controls positively impacts the effect of hedging practices on a firm's financial performance.

4.5 Repo rates, Investment Income, Hedging and Investment Income Non-Interest Income on Financial Performance of Commercial Banks listed at the Nairobi Securities Exchange

The study established the influence of Repo rate on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The results were presented as in table 4.6 below

Table 4.6 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			Durbin-Watson
					R Square Change	F Change	Sig. F Change	

1	.755[a]	.570	.512	141793868.21322	.570	9.931	.002	1.700

a. Predictors: (Constant), Repo rate, Investment Income

b. Dependent Variable: Performance

The information in table 4.6 show that a positive association exist between repo rate, investment income and banks financial performance (R = .755[a]); the variation in financial performance in banks can be explained up to 57.0% (R^2 = .570) by the explanatory variables while 43% of the variation in bank financial performance can be explained by other variables not in the model for this study. The results in table 4.6 and table 4.7 show that these variables can be relied up on in the prediction of financial performance up to 51.2% (adjusted R^2 = .512; F = 9.931; P = .002[b]< .05). A repurchase agreement (repo) is an agreement to sell securities at a given price, coupled with an agreement to repurchase these securities at a pre-specified price at a later date. A reverse repo is the same set of transactions seen from the perspective of the party lending cash and receiving the securities as collateral. A repo is economically similar to a collateralized loan since the securities provide credit protection in the event that the seller (the cash borrower) is unable to complete the second leg of the transaction.

Table 4.7 ANOVA[a]

Model		Sum of Squares	Mean Square	F	Sig.
1	Regression	399321646980255040	199660823490127520.00	9.931	.002[b]
	Residual	301582515943041220	20105501062869416.00		
	Total	700904162923296260			

a. Dependent Variable: Performance

b. Predictors: (Constant), Repo rate, Investment Income

Table 4.8 coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	112961925.754	218730000.412		.516	.613		
	Investment Income	.875	.224	.715	3.911	.001	.859	1.164
	Repo rate	16066825.122	31369628.742	.094	5.12	.000	.859	1.164

The results in table 4.8 show that unit increase in investment income causes and increase in financial performance by 0.875 and its effect size on financial performance is 71.5% (standardized Beta = .715) with significant influence (p =0.001<0.05) but for repo rate the effect size is too low at 9.4% % (Standardized Beta = .094) with significant influence on the dependent variable (p =0.000<0.05). Substituting the coefficients in the model $Y_3 = \beta 0 + \beta_3 X_3 + \beta_{33}$ $REPOR_i + \varepsilon$; the results change to $Y_3 = 112961925.754 + .875X_3 + 16066825.122REPOR_i$.

The t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients b_0, b_3, and b_{33}, relating to independent variables towards banks financial performance. For the constant $b_0 = 112961925.754$; $T_0 = .516$, the *p* values (p 0.613 > 0.05) reject H_0 and conclude that $b_0 = 112961925.754$ is not significantly different from zero. For investment income its $b_3 = 0.875$; $T_3 = 3.911$> critical value (1.734064), p =0.001< 0.05): the study rejects H_0 and conclude that b_3 is significantly different from zero and is statistically significant, therefore the effect of investment income on the banks financial performance was not zero. For Repo Rate its $b_{33} = 16066825.122$; $T_{33} = 5.12$ >critical value (1.734064), p= 0.000<0.05): the study rejects H_0 and conclude that b_{33} is significantly different

from zero and is statistically significant. Therefore, the study rejects the Null Hypothesis which stated as: There is no significant influence of Repo rate on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The variable reporate was statistically significant.

The VIF value is an index which measures how much variance of an estimated regression coefficient is increased. Rule of Thumb is applied in this study: If any of the determined VIF values exceeds 10, it implies that the associated regression coefficients are poorly estimated and multicollinearity exist (Montgomery, 2001; Murphy and Myors, 1998). Therefore this multicollinearity is deemed not severe to interfere with the relationship between independent variables and dependent variable if the VIF values fall within the expected ranges. The VIF values (VIF = 1.164) in this study are below 10 and therefore severe multicollinearity does not exist. This findings concur with past studies like Abreu and Mendes (2000) that financial performance of commercial banks is subjective measure of how commercial banks use their assets to generate revenues which is highly affected by the decisions made to effectively utilize the assets to increase profit.

The study further established the relationship between Repo Rates- Hedging, Investment Income and financial performance of commercial banks listed at NSE. The data collected was analyzed and presented as in tables below

Table 4.8a Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			Durbin-Watson
					R Square Change	F Change	Sig. F Change	
1	.776[a]	.602	.600	.51915	.600	99.639	.000	.586

a. Predictors: (Constant), Repo Rates-Hedgingg, Investment Income
b. Dependent Variable: Financial Performance

The results in table 4.8a indicate a strong and positive association between repo rate -hedging, investment income and financial performance of commercial banks listed (R = .776[a]). the result further indicates that 60.2% of the variation in financial performance can be explained by the

reporate - hedging and investment income (R^2 = .602). these variables can be relied on prediction of financial performance up to 60.0% (Adjusted R^2 = .600) and the variables are statistically significant in the model (p = 0.000<0.05). This positive relationship between hedging practices and firm financial performance is supported by the findings of Judge (2002); Weston (2001).

Table 4.8b Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	38792.613	0.516		5.06	0.000
	Investment Income	0.465	0.168	0.467	2.76	0.000
	Repo Rates-Hedging	0. 378	0.043	0.431	10.06	0.000

a. Dependent Variable: Financial Performance

The study used to model below in the analysis of results.

$Y_3 = \beta 0 + \beta_3 X_{3it} + \beta_{33}\, REPOR_{it}^{*}\ RIS\text{-}HEDG_{jt} + \varepsilon$ …….. (4.4b)

Substituting the coefficients in table 4.8b in the model it changes to

$$Y_3 = 38792.613 + 0.465X_{3it} + 0.378REPOR_{it}\ RIS\text{-}HEDG_{jt}$$

This result indicates that a unit change in bank investment Income results in 0.465 units change in financial performance of commercial banks. While the unit change in Repo Rate-Hedging components causes 0.378 units change in financial performance of commercial banks. This result reveal that repo rates-hedging and investment income when optimized in application in this sector there occurs significant improvement in financial performance of commercial banks. The t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients b_0, b_3, and b_{33}, relating to independent variables towards banks financial performance. For the constant b_0 = 38792.613; T_0 = .516, the *p* values (p 0.000 <0.05) reject H_0 and conclude that b_0 = 38792.613 is significantly different from zero. For investment income its b_3 = 0.465; T_3 = 2.76> critical value (1.734064), p =0.000< 0.05): the study rejects H_0 and conclude that b_3 is significantly different from zero and is statistically

significant, therefore the influence of investment income on the banks financial performance was not zero. For Repo Rate-Hedging its b_{33} = 0.378; T_{33} = 10.06 >critical value (1.734064), p= 0.000<0.05): the study rejects H_0 and conclude that b_{33} is significantly different from zero and is statistically significant. Therefore, the study rejects the Null Hypothesis which stated as: There is no significant influence of Repo Rate- hedging on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The variable repo rate- Hedging was statistically significant.

4.6 Analysis of Moderating Role of Hedging and Relationships between Interest Rate and Non-Interest Income on Financial Performance of Commercial Banks listed at the Nairobi Securities Exchange

The study established the moderation relationship between interest rate, hedging, non-interest income and financial performance of commercial banks listed at NSE. The result of the analysis is presented in table 4.9a and table 4.9b below

Table 4.9a Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			Durbin-Watson
					R Square Change	F Change	Sig. F Change	
1	.947[a]	.898	.889	.02594115	.898	109.734	.000	.786

a. Predictors: (Constant), X_1, X_2, X_3, CBR* RIS-HEDG, IBR *RIS-HEDG, REPOR *RIS-HEDG

b. Dependent Variable: Financial Performance

The result in table 4.9a show a strong and positive association between explanatory variables and performance of commercial banks (R = .947[a], F = 109.734). The variation in performance can be explained up to 89.8% by the explanatory variables in this study (R^2 = 0.889, p= .000< .005, F = 109.734). These variables can be relied up 88.9% in precise prediction of financial performance of commercial banks listed at NSE (adjusted R^2 = 0.889, p .000< .005, F = 109.734). The Durbin Watson statistic is a test for autocorrelation in a regression model's output. This statistic ranges from zero to four, with a value of 2.0 indicating zero autocorrelation. Values below 2.0 mean

there is positive autocorrelation and above 2.0 indicates negative autocorrelation. For this study the Durbin Watson statistic figure is 0. 786 indicate positive autocorrelation between variables in this study.

Busch (2009) study evidenced that bank returns are positively affected by higher fee income activities. The findings shows that increase in non-interest income positively impact the asset base of banks. Additionally, a strong engagement in feegenerating activities goes along with higher risk. Additionally, an assessment of the impact of fee-based services on interest margin showed that institutions with a strong focus on fee business charges lower interest margins when credit risk is controlled. Further, Mnasri and Abaoub (2010) study provided evidence that banks which diversified across both interest and non-interest income generating activities have higher levels of raw share returns than those focusing their activities this concurs with the findings of this study. However, in contrast to previous findings discussed, focusing on non-interest income generating activities decreases market profitability and market share of banks. Furthermore, banks that are functionally diversified experience higher levels of systematic risk while the effect on the idiosyncratic component is non-significant. In recent years studies have focused specifically on the effect of negative rates on bank profitability, with no common ground established.

According to Turk (2016) study finds that the profitability of banks were resilient following the introduction of negative interest rates, at least in the short and medium term, as does Basten and Mariathasan (2018) for Swiss banks. Focusing on a large cross-country sample of European and Japanese banks, Lopez, Rose and Spiegel (2020) report that the implications of negative rates for bank profitability were because banks were able to offset interest income losses under negative rates with gains in non-interest income, including fees and capital gains. By contrast, Rostagno et

al (2019) estimated that euro area bank profitability had a lower in counter factual scenarios in which the policy interest rate remained at zero or above. Further a study by Urbschat (2018), Molyneux, Reghezza and Xie (2019) and Beauregard and Spiegel (2020) found that negative interest rates reduce bank profitability in the longer run, partly because of banks' limited ability to pass on negative rates to depositors or otherwise adjust their business models.

Table 4.9b Coefficients[a] of Variables in the Study

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.651	.027		2.247	.027		
X_1	.421	.000	.722	4.783	.000	.049	20.227
X_2	.592	.000	1.412	15.393	.000	.134	7.467
X_3	.389	.000	.007	.208	.003	.982	1.019
CBR* RIS-HEDG	.255	.010	.452	5.381	.000	.160	6.265
IBR *RIS-HEDG	.461	.000	.250	3.518	.000	.042	23.991
REPOR *RIS-HEDG	.544	.009	.326	4.855	.000	.250	4.000

a. Dependent Variable: Financial Performance

The regression model below was used

$Y = \beta 0 + \beta_1 X_{1it} + \beta_{11}\ CBR_{it}\ RIS\text{-}HEDG_{jt} + \beta_2 X_{2it} + \beta_{22}\ IBR_{it}\ RIS\text{-}HEDG_{jt} + \beta_3 X_{3it} + \beta_{33}\ REPOR_{it}$ $RIS\text{-}\ HEDG_{jt} + \varepsilon$ ……………………………………...………………..………… (4.5a)

When the coefficients are substituted the model changes to;

$Y = 0.651 + 0.421X_{1it} + 0.255\ CBR_{it}\ RIS\text{-}HEDG_{jt} + 0.592X_{2it} +0\ .461\ IBR_{it}\ RIS\text{-}HEDG_{jt} +$ $0.389X_{3it} + 0.544\ REPOR_{it}\ RIS\text{-}\ HEDG_{jt}$ ……………………………….………….………… (4.5b)

The result indicate that a unit increase in commissions on loans results in 0.421 units increase in financial performance and effect size of 72.2% on financial performance (standardized beta = .722). this variable has statistically significant influence on financial performance ($b_1 = 0.421$; $T_1 = 4.783$>critical value (1.734064), p =0.000< 0.05). The result on Central bank rate and hedging

combination an increase in their use causes 0.255 units increase in financial performance (b_{11} = 0.255; T_{11} = 5.381>critical value (1.734064), p =0.000< 0.05) indicating that this variable has a statistically significant influence on financial performance of commercial banks. The unit increase in interbank rates and hedging combination causes 0.461unit increase on financial performance of commercial banks (b_{22} = 0.461; T_{22} = 3.518>critical value (1.734064), p =0.000< 0.05) indicating that this variable has a statistically significant influence on financial performance of commercial banks. Further the results indicate that a unit increase in use of Repo rate and hedging combination causes 0.544 units increase in financial performance of commercial banks and the influence is statistically significant (b_{33} = 0.544; T_{33} = 4.855 >critical value (1.734064), p =0.000< 0.05) on Commercial banks listed at NSE.

The results of this study concur with Goselin (2007) study which found no statistical evidence of relationship between central bank performance in terms of its rates and the degree of financial market development. However, study by Krause and Rioja (2006), found similarity in the sense that the strength of the private banking sector was positively correlated with meeting targets more consistently, since the soundness and financial strength of private banks are both negatively correlated with inflation deviations as aspects of interest rates. Reviewed studies have shown mixed association between hedging and firm performance. For instance, Allayannis and Weston (2001) and Carter et al., (2006) shows that hedging have a positive effect on firm's performance. However the results of this study differ with findings of Fauver and Naranjo (2010); Dhanani et al., (2007); Bodnaret al. (2003) study which show that hedging does not necessarily have a positive association with performance but depends on a country, industry and corporate governance of the company. Studies by Guttierez (2003); Goselin (2007); Krause and Rioja (2006) support the descriptive findings of this study whereby the researchers acknowledge

economic independence, central bank rates and inflationary controls on interest rates as some of the measures of central bank controls that influence financial performance of commercial banks. Hoffmann et al (2019) study revealed movements in the yield curve are likely to have a larger impact on bank profits. Ordinarily, Net Interest Margins will narrow when yield curves flatten because banks are exposed to interest rate risk from maturity mismatches because of borrowing short and lending long. The extent to which banks reduce their exposure to this risk by hedging impacts their sensitivity to changes in the yield curve. Banks are also exposed to interest rate risk stemming from holding a greater amount of fixed-rate liabilities such as non-interest bearing deposits relative to fixed-rate assets, such that when interest rates decline net income from these positions falls. Banks can choose to hedge this risk using swaps whereby the bank receives cash flows linked to fixed rates and pays cash flows linked to variable rates. As a result, when variable rates decline the income from these hedges increases, thereby providing the necessary hedge. The extent to which some banking systems use interest rate swaps to hedge this risk causes differences in the pass through of lower rates to profits in the short run in the banking sector.

4.7 Summary of hypothesis testing

No	Null Hypothesis	Results
H_{01}	There is no significant influence of Central Bank Rate (CBR) and bank commissions on loans as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange.	Rejected
H_{02}	There is no significant influence of interbank rates and transactions account as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange.	Rejected
H_{03}	There is no significant the influence of Repo rates and investment income as a non-interest on financial performance of commercial banks listed at the Nairobi Securities Exchange	Rejected

H_{04}	There is no significant moderating role of hedging on the relationship between interest rates and non -interest income on the financial performance of commercial banks listed at the Nairobi Securities Exchange	Rejected

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of finding, conclussions drawn and recommendations emanating from the research.

5.2 Summary of Findings

This section presents the summary of major findings and conclusions and recommendations per objective in this study.

5.2.1 Influence of Central Bank Rate (CBR) and bank commissions on loans as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange

The study established the influence of Central Bank Rate on the relationship between bank commissions on loans income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The results on the fitness of the variables in the model used in this study was up to 73.3% (adjusted R^2 = .733; F = 24.336, P = .000[b]). This results indicated that the model can be relied on up to 73.3% in predicting financial performance of the banks. The results indicated that bank commissions on loans unit increase causes 0.671 unit increase in banks financial performance. While central bank rates unit increase causes 90679092.591 increase in financial performance of banks. When the coefficients substituted in the model $Y_1 = \beta 0 + \beta_1 X_1 + \beta_{11} CBR_i + \varepsilon$; the results reveal that $Y_1 = 518289032.827 + .671X_1 + 90679092.591CBR_i$.

The study further analyzed the relationship between the Central Bank Rates, bank Commissions on loans income, Hedging and financial performance of Commercial banks listed at NSE. The results showed that there exist a strong association between the explanatory variables and the

dependent variable (financial performance of banks). The variables can explain up to 53.9% variation in financial performance of commercial banks ((R= .734[a]; R^2 = .539) and these variables were reliable in the prediction of financial performance up to 53.3% (Adjusted R^2 = .533) and their influence on financial performance is statistically significant (p = .000). The result in the model indicated that a unit change in bank commissions on loans results in 0.681 units change in financial performance of commercial banks. While the unit change in central bank rates and hedging components causes 0.957 units change in financial performance of commercial banks. This result reveal that CBK rates and hedging when optimized in application in this sector the financial performance improves significantly. The coefficients indicate the nature of association of the variable in the model. Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients $b_{0,}$ b_1, and $b_{11,}$ relating to independent variables towards banks financial performance. For the constant b_0 = .660; T_0 = 8.292, the p values (p 0.000 < 0.05) reject H_0 and conclude that b_0 = .660 is not significantly different from zero. For bank commissions on loans its b_1 = .681; T_1 = 4.003> critical value (1.734064), p =0.000 < 0.05): the study concludes that b_1 is significantly different from zero and is statistically significant, therefore influence of bank commissions on loans on the banks financial performance was not zero. For central bank rates-hedging its b_{11} = .957; T_{11} = 15.882> critical value (1.734064), p= 0.000< 0.05): the study concludes that b_{11} is significantly different from zero and is statistically significant, therefore influence of central bank rates-Hedging on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis stated as: There is no significant relationship between of Central Bank Rate, hedging, bank commissions on loans income and financial performance of commercial banks listed at the Nairobi Securities Exchange. These variables

were therefore statistically significant in influencing financial performance of commercial banks listed at Nairobi Securities Exchange.

5.2.2 Influence of Interbank rates and transactions account as a non-interest income on financial performance of commercial banks listed at the Nairobi Securities Exchange

The study established the influence of interbank rates on the relationship between transactions account income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The results indicated a positive and strong association exist between the explanatory variables and banks financial performance ($R = 0.807^{a}$). The interbank rates and transaction account income explain up to 65.1% of the variation in bank performance ($R^2 = 0.651$; $F = 13.979$) and the effect is statistically significant ($p < .05$). The variables in the model can be relied on in the prediction of banks financial performance up to 60.4% (adjusted $R^2 = .604$), this implies that other variables exist which accounts for 39.6% of the variation in financial performance of these banks. The results indicate that a unit increase in interbank rates causes an increase of banks financial performance by 104785863.593 increase while a unit increase in transaction accounts income causes increase of 0.024 in banks financial performance. Substituting the coefficients in the model $Y_2 = \beta 0 + \beta_2 X_2 + \beta_{22} IBR_i + \varepsilon$; the results show that $Y_2 = 37906836.556 + .249X_2 + 104785863.593\ IBR_i$. The findings further reveal that the effect size of interbank rates on financial performance of the banks was significantly high at 77.8% (standardized beta = .778) while the effect size of transaction account income was at 3.3% (standardized beta = .033).

Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients b_0, b_2, and b_{22}, relating to independent variables towards banks financial performance. For the constant $b_0 = 37906836.556$; $T_0 = .322$, the *p* values (p 0.752 > 0.05) reject H_0 and conclude that $b_0 = 37906836.556$is not significantly

different from zero. For transaction account income its $b_2 = 0.249$; $T_2 = 0.103$< critical value (1.734064), p =0.920> 0.05): the study fails to reject H_0 and conclude that b_2 is not significantly different from zero and is statistically insignificant, therefore the effect of transaction account income on the banks financial performance was zero. For interbank rates its $b_{22} = 104785863.593$; $T_{22} = 2.452$> critical value (1.734064), p= 0.027< 0.05): the study rejects H_0 and conclude that b_{22} is significantly different from zero and is statistically significant, therefore effect of interbank rates on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis which stated as: There is no significant influence of interbank rates on the relationship between transactions account income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The variable interbank rates were statistically significant in influencing the financial performance of commercial banks listed at Nairobi securities exchange.

The study further established the relationship between interbank rates, hedging, transaction account income and financial performance of commercial banks listed at NSE. The results revealed a strong and positive association between the Interbank Rate, Hedging, Transaction Account Income and financial Performance ($R = .849^a$). This is almost a perfect association between the two variables in this study. It is observed that Interbank Rate, Hedging, Transaction Account Income can explain upto 72% of the variation in yield of financial performance ($r^2 = .720$), this explanatory variable Interbank Rate, Hedging, Transaction Account Income can be relied with accuracy and preciseness in the prediction of performance of commercial banks up to 71.7% (adjusted $r^2 = .717$) and it is statistically significant (p =0.000<0.05). Therefore, the result out of this variable in the model can be relied on in the prediction of financial performance of commercial banks listed at Nairobi Securities Exchange.

The result of coefficients when substituted in the model it indicates that a unit change in bank Transaction Account Income results in 1.270 units change in financial performance of commercial banks. While the unit change in Interbank Rate, Hedging components causes 0.184 units change in financial performance of commercial banks. This result reveal that interbank rates, hedging and Transaction Account income when optimized in application in this sector there occurs significant improvement in financial performance of commercial banks. The coefficients indicate the nature of association of the variable in the model.

Further t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients $b_{0,}$ b_2, and $b_{22,}$ relating to independent variables towards banks financial performance. For the constant $b_0 = 379066.78$; $T_0 = 5.973$, the p values (p 0.000 < 0.05) reject H_0 and conclude that $b_0 = 379066.78$is not significantly different from zero. For bank Transaction Account Income its $b_2 = 1.270$; $T_2 = 8.360$> critical value (1.734064), p =0.000 < 0.05): the study concludes that b_2 is significantly different from zero and is statistically significant, therefore influence of bank Transaction Account Income on the banks financial performance was not zero. For interbank rates, hedging its $b_{22} = 0.184$; $T_{22} = 2.036$> critical value (1.734064), p= 0.026< 0.05): the study conc ludes that b_{22} is significantly different from zero and is statistically significant, therefore influence of Interbank Rates, Hedging on the banks financial performance was not zero. Therefore, the study rejected the Null Hypothesis stated as: There is no significant relationship between of Interbank Rate, hedging, Transaction Account Income and financial performance of commercial banks listed at the Nairobi Securities Exchange. These variables were therefore statistically significant in influencing financial performance of commercial banks listed at the Nairobi securities exchange.

5.2.3 Influence of Repo rates and investment income as a non-interest on financial Performance of commercial banks listed at the Nairobi Securities Exchange

The study established the influence of Repo rate on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The results show that a positive association exist between repo rate, investment income and banks financial performance (R = .755[a]); the variation in financial performance in banks can be explained up to 57.0% (R^2 = .570) by the explanatory variables while 43% of the variation in bank financial performance can be explained by other variables not in the model for this study. The results further show that these variables can be relied up on in the prediction of financial performance up to 51.2% (adjusted R^2 = .512; F = 9.931; P = .002[b]< .05). The results show that unit increase in investment income causes and increase in financial performance by 0.875 and its effect size on financial performance is 71.5% (standardized Beta = .715) with significant influence (p =0.001<0.05) but for repo rate the effect size is too low at 9.4% % (Standardized Beta = .094) with significant influence on the dependent variable (p =0.000<0.05). Substituting the coefficients in the model $Y_3 = \beta 0 + \beta_3 X_3 + \beta_{33}\, REPOR_i + \varepsilon$; the results change to $Y_3 = 112961925.754 + .875X_3 + 16066825.122REPOR_i$. The t-test on the degree of significance of the variables was applied.

This aimed at testing for the degree of significance of regression coefficients b_0, b_3, and b_{33}, relating to independent variables towards banks financial performance. For the constant b_0 = 112961925.754; T_0 = .516, the *p* values (p 0.613 > 0.05) reject H_0 and conclude that b_0 = 112961925.754 is not significantly different from zero. For investment income its b_3 = 0.875; T_3 = 3.911> critical value (1.734064), p =0.001< 0.05): the study rejects H_0 and conclude that b_3 is significantly different from zero and is statistically significant, therefore the effect of investment

income on the banks financial performance was not zero. For Repo Rate its b_{33} = 16066825.122; T_{33} = 5.12 >critical value (1.734064), p= 0.000<0.05): the study rejects H_0 and conclude that b_{33} is significantly different from zero and is statistically significant. Therefore, the study rejects the Null Hypothesis which stated as: There is no significant influence of Repo rate on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The variable repo rate was statistically significant in influencing the financial performance of commercial banks listed at Nairobi securities exchange. The study further established the relationship between Repo Rates-Hedging, Investment Income and financial performance of commercial banks listed at NSE. The results indicate a strong and positive association between repo rate, hedging, investment income and financial performance of commercial banks listed (R = .776[a]). the result further indicates that 60.2% of the variation in financial performance can be explained by the repo rate, hedging and investment income (R^2 = .602). these variables can be relied on prediction of financial performance up to 60.0% (Adjusted R^2 = .600) and the variables are statistically significant in the model (p = 0.000<0.05). This result indicates that a unit change in bank investment Income results in 0.465 units change in financial performance of commercial banks. While the unit change in Repo Rate- Hedging components causes 0.378 units change in financial performance of commercial banks. This result reveal that repo rates, hedging and investment income when optimized in application in this sector there occurs significant improvement in financial performance of commercial banks.

The t-test on the degree of significance of the variables was applied. This aimed at testing for the degree of significance of regression coefficients $b_{0,}$ b_3, and $b_{33,}$ relating to independent variables towards banks financial performance. For the constant b_0 = 38792.613; T_0 = .516, the *p* values (p 0.000 <0.05) reject H_0 and conclude that b_0 = 38792.613 is significantly different from zero. For investment income its b_3 = 0.465; T_3 = 2.76> critical value (1.734064), p =0.000< 0.05): the

study rejects H_0 and conclude that b_3 is significantly different from zero and is statistically significant, therefore the influence of investment income on the banks financial performance was not zero. For Repo Rate, Hedging its b_{33} = 0.378; T_{33} = 10.06 >critical value (1.734064), p= 0.000<0.05): the study rejects H_0 and conclude that b_{33} is significantly different from zero and is statistically significant. Therefore, the study rejects the Null Hypothesis which stated as: There is no significant influence of Repo Rate, hedging on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. The variable repo rate, Hedging was statistically significant. The study established the relationship between interest rate, hedging, non-interest income and financial performance of commercial banks listed at NSE. The result of the analysis show a strong and positive association between explanatory variables and performance of commercial banks (R = .947[a], F = 109.734). The variation in performance can be explained up to 89.8% by the explanatory variables in this study (R^2 = 0.889, p= .000< .005, F = 109.734). These variables can be relied up 88.9% in precise prediction of financial performance of commercial banks listed at NSE (adjusted R^2 = 0.889, p .000< .005, F = 109.734). indicating a statistically significant influence on the financial performance of commercial banks listed at Nairobi Securities Exchange.

5.3 Conclusion

Based on the findings enlisted in the results, the study has therefore uncovered very important aspects in the banking sector. Firstly, the study began by analyzing the relationship between the Central Bank Rates, bank Commissions on loans income, Hedging and the financial performance of Commercial banks listed at NSE. The study showed categorically that there exists a strong association between the explanatory variables and the dependent variable (financial performance of banks). The study further indicated that there is a direct positive impact of bank commissions on loans on the financial performance of banks listed in NSE.

Secondly, the study further attempted to establish the relationship between interbank rates, hedging, transaction account income and financial performance of commercial banks listed at NSE. It revealed that there is a strong and positive association between the Interbank Rate, Hedging, Transaction Account Income and financial Performance.

The study went further to establish the influence of Repo rate on the relationship between investment income and financial performance of commercial banks listed at the Nairobi Securities Exchange. In the analysis, the study showed indeed there is a strong and a positive association between repo rate, investment income and banks' financial performance.

The study therefore has unraveled very novel knowledge in the banking sector. It has revealed that there is enormous improvement on the financial performance of commercial banks when the interest rates of CBK are optimized. Further, the study has made us learn that there exists a very strong and positive correlation between the Interbank Rate-Hedging, Transaction Account Income and financial Performance of the banks. The findings of this study are of value to various parties which include: the government and other policy makers and regulators, the management of commercial banks and other financial institutions, investors and the existing literature.

Based on the findings on interest rates constructs, hedging, non-interest income and financial performance of commercial banks listed at the NSE, the study concludes that these variables have a significant influence on the financial performance of the commercial banks. Therefore, the commercial banks are advised on using them to increase their financial performance for competitive advantage in the commercial sector.

5.4 Recommendations

From the findings and conclusion on interest rates, hedging and non-interest income influence on financial performance the study recommends that commercial banks need to optimize on the interest rates and hedging to improve on their interest incomes and financial performance in any dynamic economic environment.

As contained in the Central Bank of Kenya Monetary Policy Document 2020, one of the Instruments and transmission of the monetary policy is the Central Bank Rate (CBR). Movements in the CBR, both in direction and magnitude, signal the monetary policy stance. In order to enhance clarity and certainty in monetary policy implementation, the CBR is the base for all monetary policy operations. Movements in the CBR are transmitted to changes in short-term interest rates. A reduction of the CBR signals an easing of monetary policy and a desire for

market interest rates to move downwards. Lower interest rates encourage economic activity and thus growth. When interest rates decline, the quantity of credit demanded should increase. Therefore, to strengthen the recommendations given in the monetary policy statement, the study recommends that the commercial banks should maximize use of interest rates, non-interest incomes and hedging to maximize their financial performance.

For the sake of further research, it is strongly recommended that a research study be launched to analyze the impact of interest rates, hedging and non-interest income on the financial performance of commercial banks that are not listed at the Nairobi Securities Exchange.

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APPENDICES

Appendix I: Data Collection Guide

YEAR RANGE	BANK			VARIABLES				
		Y_i	X_1	X_2	X_3	RIS-HEG$_i$		
2000 to 2021	ABSA Bank of Kenya							
	Co-operative Bank of Kenya Limited							
	Diamond Trust Bank Kenya Limited							
	Equity Bank Limited							
	Housing Finance Company Limited							
	I&M Holdings Limited							
	Kenya Commercial Bank Limited							
	National Bank of Kenya Limited							
	NIC Bank Limited							
	Standard Chartered Bank							

Y_i= Dependent variable X_1=Independent variable1 X_2= Independent variable 2

X_3= Independent variable 3

YEAR RANGE	BANK			VARIABLES				
		CBK rates	IBRi	REPO Rates	RIS-HEG$_i$			
2000 to 2021	ABSA Bank of Kenya							
	Co-operative Bank of Kenya Limited							
	Diamond Trust Bank Kenya							
	Equity Bank Limited							
	Housing Finance Company							
	I&M Holdings Limited							
	Kenya Commercial Bank Limited							
	National Bank of Kenya Limited							
	NIC Bank Limited							
	Standard Chartered Bank							
	CFC Stanbic Holdings Limited							

Appendix II: Map of Kenya : Study Area