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## **Financial Risk Hedging and Financial Performance of Commercial Banks Listed in Nairobi Securities Exchange, Kenya**

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# Financial Risk Hedging and Financial Performance of Commercial Banks Listed in Nairobi Securities Exchange, Kenya

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## Abstract

In Kenya, financial institutions play a vital role in economic development by facilitating investments through receiving and lending funds, but they face market-driven financial risks that impact their performance, including a decline in Return on Assets over the past decade. This study aimed to determine the relationship between financial risk hedging techniques and the financial performance of Kenyan commercial banks listed on the Nairobi Securities Exchange (NSE). The study's specific objectives included forward contract, future contract, currency diversification of currencies, and swaps hence bank size is used as moderating variables. The agency theory, profit maximization theory, and enterprise risk management theory supported the study, providing a theoretical foundation for exploring the relationship between financial risk hedging and the financial performance of publicly traded commercial banks in Kenya. A descriptive correlational approach was adopted to target all publicly traded commercial banks in Kenya, with a census conducted to ensure comprehensive coverage. Secondary data was collected annually over a five-year period (2017–2021) from publications by the Nairobi Securities Exchange and the respective commercial banks, utilizing a structured data collection form. Diagnostic tests, including normality, multicollinearity, heteroscedasticity, and stationarity, were performed, confirming that the data met the required assumptions for analysis. The data was subsequently transformed to ensure that regression analysis could be conducted without producing spurious results. Descriptive statistics were summarized using means and standard deviations, while correlation and regression analyses were employed to test the hypotheses and draw meaningful conclusions. The correlation analysis revealed that using forward contracts as a hedging strategy has a strong positive and significant impact on financial performance. The futures, swaps, and currency diversifications also they had positive correlation against financial performance, and they had significant relationship. The regression study revealed a strong positive link between risk hedging and financial success, indicating a noteworthy correlation. Forward and future contracts were revealed to be risk-hedging approaches with significant effects on commercial bank financial performance, implying that currency diversification and swaps had a positive and significant effect on financial performance. Size had a strong favorable impact on the link between risk hedging and financial performance. The study recommends that bank executives and stakeholders should adopt robust risk management approaches and diversification strategies to enhance financial performance and stability in the banking sector. The Central Bank of Kenya (CBK) should regulate high-risk financial hedging products and require banks to disclose their use of financial derivatives, while the government should create supportive policies to promote these tools, ultimately strengthening financial institutions and fostering economic growth.

**Keywords:** Forward contracts, future contracts, currency diversity, swaps, bank size, financial performance, commercial banks, Kenya

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## **1.0 Background of the Study**

Cavusgil, Knight, Riesenberger, Rammal, and Rose (2014) highlighted the pivotal role of commercial banks in driving global economic progress. Banks facilitate economic growth by collecting reserves from firms with excess funds and redirecting them to industrial and governmental projects. They support businesses through loans, training, and payment services, playing a key role in ensuring economic stability and growth (Issahaku, 2018). Commercial banks also serve as a bridge between surplus and deficit units globally, ensuring smooth financial operations (Frensidy & Mardhaniaty, 2019). Despite facing challenges like the global financial crisis, which disrupted global banking systems and caused fluctuations in profitability metrics like Return on Assets (ROA) from 2006 to 2010, banks have demonstrated resilience and adaptability (Butnariu, Luca, & Apetrei, 2018).

In Kenya, the banking sector has grown significantly since the 2000s, with notable increases in net assets and profitability, despite facing challenges such as fluctuating ROA and economic instability (CBK, 2018; KBA, 2020). Financial risks originating from uncertainties in financial markets significantly impact businesses by exposing them to potential losses, thereby reducing financial performance and hampering shareholder wealth maximization (Bartram, Brown & Waller, 2015). These risks stem from fluctuating interest rates, foreign exchange rates, and commodity prices, as well as transactional risks with customers and organizations (Allen & Carletti, 2013). To address these uncertainties, businesses adopt hedging strategies aimed at stabilizing cash flow and ensuring operational continuity (Aiba, Odajima & Khou, 2018).

Hedging strategies help businesses mitigate risks associated with price volatility, which, if unmanaged, can severely affect a company's financial health (Horne & Wachowicz, 2012). Hedging is a globally recognized risk management tool that reduces the impact of price changes on financial performance. As noted by Brigham and Ehrhardt (2014), hedging offers cost-effective and flexible solutions similar to stock portfolio diversification. Firms achieve this by utilizing financial instruments such as forward contracts, futures, options, and swaps to manage risks related to interest rates, foreign exchange, and commodity prices (Bartram et al., 2011). Research by Firouzi and Vahdatmanesh (2019) found that organizations using hedging strategies experienced reduced overall risks, particularly in non-financial firms operating across 47 countries. These strategies enable firms to safeguard their financial performance from the adverse effects of market volatility.

Globally, the adoption of hedging practices varies depending on factors such as firm size, access to financial instruments, and regulatory environments. Rossi (2007) observed that Brazilian corporations' hedging decisions were influenced by their size and foreign currency debt levels. Similarly, larger firms and public corporations in the United Kingdom use derivatives more frequently than smaller firms, reflecting their capacity to manage fixed costs and access financial instruments (Berghöfer & Lucey, 2014). In developing countries, however, hedging practices are often limited. For instance, South African regulations restrict derivatives to short-term contracts (Ramlall, 2009). Meanwhile, in Mauritius, hedging is positively linked to firm size and age, while in Ghana, over-the-counter forwards and currency swaps are commonly used to manage foreign exchange risks (Abor, 2015).

In Kenya, the significant reliance on imports and fluctuating exchange rates makes hedging essential for mitigating foreign exchange risks. Kenyan firms, particularly those involved in international trade, have recognized the importance of hedging strategies to manage currency volatility effectively (Kiptisya, 2017). However, Luo and Wang (2018) noted that there is limited statistical data quantifying the extent to which Kenyan firms adopt hedging practices.

Inflation, a major source of financial risk in Kenya, further complicates financial operations, as highlighted by CBK (2010). Despite the challenges, Kenyan businesses employ various hedging strategies to minimize risks, although the impact of these practices on bank performance remains uncertain.

Forward and future contracts have emerged as key instruments in hedging strategies. Kelvin (2010) defined forward contracts as legally binding agreements to purchase or sell assets or currencies at a predetermined future price, effectively reducing financial risks. Research by Rosemary (2016) demonstrated a positive correlation between forward contracts and the financial performance of non-financial firms listed on the NSE, while Junttila, Pesonen, and Raatikainen (2018) found that forward contracts were less effective in mitigating foreign exchange volatility. Future contracts, on the other hand, are more standardized and enforceable, reducing the likelihood of breaches compared to forward contracts (Torbira, 2017). Although futures contracts positively relate to interest rate management, their relationship with foreign exchange rate risks has been mixed.

Currency diversification and swaps are also widely used hedging strategies. Currency diversification, as noted by Álvarez-Díeza, Alfaro-Cidb, and Fernández-Blanco (2016), involves using multiple currencies to minimize risks associated with single-currency exposure. Kenyan banks use tools like the Herfindahl-Hirschman Index (HHI) to measure currency market shares and manage foreign exchange risks effectively (Giraldo-Prieto et al., 2017). Swaps, particularly interest rate swaps, have gained popularity as financial derivatives for managing risk (Andrew, 2011). Dimitris (2015) highlighted that swaps allow firms to exchange currencies and interest rate obligations, ensuring stability in volatile financial markets. Larger banks with substantial resources are more likely to use swaps than smaller institutions, reflecting their capacity to manage complex financial instruments (Lyes, 2002). These strategies collectively underscore the critical role of hedging in enhancing financial stability and performance in both global and local contexts.

Hence, the study examined the relationship between financial risk hedging strategies and the financial performance of commercial banks listed on the Nairobi Securities Exchange (NSE). Specifically, it explored how hedging practices such as forward contracts, futures contracts, currency diversification, and swaps impact financial performance, measured through Return on Assets (ROA) and Return on Equity (ROE). The study also assessed the moderating effect of bank size on this relationship, recognizing the significant role of financial risk management in mitigating uncertainties related to interest rates, foreign exchange rates, and market fluctuations. By analyzing these relationships, the study aimed to provide insights into the effectiveness of hedging as a risk management strategy in enhancing the financial performance of commercial banks in Kenya, a sector characterized by rapid growth and significant contributions to economic development.

### **1.1 Statement of the Problem**

Commercial banks in Kenya play an important role in the economy. Commercial bank growth is a measure of economic growth. Because of the large population served by commercial banks, their performance has a direct impact on the whole public. The decline of several banks in past years shown how banks directly affects businesses and public at large and trauma they create in the economy. Due to this the banks try to resist risk hence the daily operations of commercial banks involve taking risks and effectively managing them to achieve desired objectives (Kiio & Jagongo, 2017). Management is in charge of managing both internal and external risks that bring opportunities and hazards to their companies. The global financial crisis demonstrated

the critical role that banks play in minimizing the risks that contribute to bank imbalances. Due to lack of effective hedging and the use of costly procedures to reduce these risks, commercial banks in Kenya are losing money (Murungi, Murage & Wanjau, 2014). The performance of commercial banks was not stable since 2009 as it recorded ROA of 3.5%, 2010 was 4.5% and 2012 reached up to 5% but in 2012, the ROA declined and eventually dropped to 3% in 2017. In the year 2018, the banking sector realized slight growth of 0.5% but in 2019 went back to the decelerating period.

Several research projects have been conducted to demonstrate the relationship between financial risk hedging and commercial bank financial performance; nevertheless, the outcomes of these studies have been in dispute with one another. Other studies failed to mention whether financial risk has any significant relationship or the direction of the relationship with performance. Karimunde (2009) studied financial risk hedging strategies and focused on identifying the common financial risk hedging strategies that are used in the banking sector and policies that are used for hedging financial risks. There was little association between commercial banks' financial success and their usage of financial risk management (Jenifer 2014). Anyango (2016) looked into the relationship between commercial banks' financial derivatives and financial performance and discovered no meaningful correlation.

Kiio and Jagongo (2017) performed research on the practices and performance of NSE-listed enterprises in terms of financial risk hedging. The researchers conducted a thorough analysis of the broader economy and observed a strong relationship between controlling foreign exchange risk by hedging and achieving positive financial outcomes. The study discovered no significant correlation between interest rate risk hedging and return on assets (ROA) or return on equity (ROE). Githinji (2016) conducted research to investigate the effect of bank deposits and liquidity risk on financial performance. However, there was no apparent link found between credit risk, capital management, and performance. The study on the impact of financial risk management on the financial performance of Kenyan commercial banks discovered that foreign exchange had no discernible effect on financial performance. Mauko (2016) investigated the effects of financial risk management on commercial banks. The findings revealed that financial risk management techniques implemented by commercial banks in Kenya had a significant impact on their financial performance. More particular, it was revealed that the effect of interest rate risk on profitability was minimal.

Muteti's (2014) study intended to determine the impact of financial risk management on bank overall performance. The findings found that there was no statistically significant link between risk management and commercial bank financial performance in Kenya. Shaofang and Meteji (2014) investigated the use of financial derivatives and risk management in American banks. Their findings demonstrated a strong correlation between financial derivatives and systematic risk, notably for interest rate and foreign currency rate exposures. Pankaj Sinha and Saksh Sharma did a study in 2013 to look into the use of derivatives and its impact on total risks faced by Indian banks. A significant link between the two variables was discovered. Financial derivatives can help to manage systemic risks like foreign exchange and interest rates. The examined study had limitations because it was carried out in countries other than Kenya, such as India, the United States, and the United Kingdom. Furthermore, some of these studies used derivatives rather than financial risk hedging as the independent variable. This study aims to bridge research gaps by looking into the effect of financial risk hedging on the financial performance of Kenyan commercial banks.

## 1.2 Research Objectives

- i. To examine the impact of forward contracts on the financial performance of Kenyan commercial banks listed on the Nairobi Securities Exchange (NSE).
- ii. To assess the impact of future contracts on the financial performance of commercial banks listed on the Nairobi Securities Exchange in Kenya.
- iii. To evaluate the effects of currency diversity on the financial performance of Kenyan commercial banks listed on the Nairobi Securities Exchange.
- iv. To assess the effects of swaps on the financial performance of commercial banks listed on the Nairobi Securities Exchange in Kenya.
- v. To investigate the moderating effects of bank size on the connection between financial risk hedging and the financial performance of commercial banks listed on the Kenyan National Stock Exchange.

## 1.3 Research Hypothesis

The study tested the following hypotheses:

- i. **H<sub>01</sub>:** Forward contracts does not have significant effect on financial performance of commercial banks listed at NSE, Kenya.
- ii. **H<sub>02</sub>:** Future contract does not have significant effect on financial performance of commercial banks listed at NSE, Kenya.
- iii. **H<sub>03</sub>:** Currency diversification does no have significant effect on financial performance of commercial banks listed at NSE, Kenya.
- iv. **H<sub>04</sub>:** Swaps do not have significant effect on financial performance of commercial banks listed at NSE, Kenya.
- v. **H<sub>05</sub>:** The size of a bank does not have a moderating effect on financial risk hedging and financial performance of commercial banks listed at NSE, Kenya.

## 2.0 Literature Review

The literature review consists of theoretical review, empiriocal review and conceptual framework.

### 2.1 Theoretical Review

Theoretical discusses the theories that underpin the research; it provides context for the investigation, such as how independent and dependent variables connect to one another. The theories examined in the paper include agency theory, profit maximization theory, and enterprise risk management.

#### 2.1.1. Modern Portfolio Theory

Markowitz developed modern portfolio theory in 1952. Its primary goal is to explain to investors the relationship between return and risk in investments. The theory aims to maximize financial returns while minimizing risks through risk management methods and formulas for calculating returns. Fundamentally, the theory places significant emphasis on the inherent trade-off between returns and risks. Investors, who are cautious about taking risks, aim to maximize the returns on their portfolios while limiting potential dangers that could affect their invested assets. The modern portfolio theory serves as the foundation for other theories used to determine portfolio returns and associated risks. Numerous scholars have developed various theories, tools, and methods to manage, identify, and analyse risks. These theories provide support for the contemporary portfolio theory. Jack coined the term "Market Value of Risk Asset" in 1962, with an emphasis on the portfolio's market value and associated risks. This

concept aligns with the MPT theory, assuming that Jack's comparison of market value and risks holds true. In 1965, Sharp modified the MPT and introduced the Capital Asset Pricing Theory (CAPM). Sharp included risk-free rates of returns alongside other rates of returns with risks. The CAPM theory assumes the existence of risk-free rate of return and, in 1972, Ross expanded on this concept in her working paper, proposing the Arbitrage Pricing Theory (APT). APT is derived from CAPM, making the capital asset pricing model an offspring of the MPT. Ross described the occurrence of arbitrage in asset pricing, anticipating that it would gradually decline as market mechanisms adjusted.

The Modern portfolio theory asserts that asset returns follow a normal distribution in the market, indicating that no person can achieve higher returns. Additionally, it presupposes that investors possess rationality and actively steer clear of avoidable dangers. Investors dedicate substantial effort to optimize the returns on their investments. The hypothesis posits that all investors possess equitable access to market information. Nevertheless, the current portfolio theory is not without its limitations. It fails to take into account transaction expenses or fluctuations in market conditions. Moreover, it depends on historical performance to estimate future pricing, which may not reliably forecast future performance. The modern portfolio theory calculates investment returns, thereby linking the financial performance of investments with the associated financial risks. It has become a vital tool for analysing and managing market risks, aiming to enhance the value of investments through value maximization for firms.

### **2.1.2 Profit Maximization Theory**

The origin of the idea of profit maximization can be attributed to Adam Smith's book "The Wealth of Nations," which was released in 1776 (Thomas, 2012). According to Smith, corporate entities and firms operate in their own self-interest to maximize profits and increase their value. The benefit of this pursuit extends to society as a whole. Organizations strive to achieve their goals through profitability, creativity, and resource utilization. They invest in goods and/or services, subsequently selling or offering them to customers in order to generate profits. The success of a company depends on its ability to generate income, as revenue is essential for future profitability and the replacement of existing assets (Thomas, 2012).

The motivation behind financial risk management, as per the profit maximization theory, is primarily driven by the long-term objective of maximizing an organization's revenues. The ultimate goal is to establish a sustainable competitive advantage (Gerhart, 2017). This perspective suggests that increasing productivity and performance in an organization serves the purpose of profitability and, by extension, profit maximization. Productivity and performance indicators include revenue generation, innovation, and the ability to provide services (Gerhart, 2017). The profit maximization theory is incredibly essential since it connects the study's dependent and independent variables. Risk hedging tries to increase investment profits, eventually leading to wealth maximization. Every organization strives to maximize profits for its own benefit, thereby improving its market position while fulfilling its mandates and obligations (Thomas, 2012). State corporations endeavour to fulfil their mandates through income generation, innovation, improved service delivery, and the conversion of resources into goods and/or services that can be sold to customers for a profit. The performance and productivity of firms are determined by the revenue generated, but it is crucial that these revenues are reinvested in the company to enhance innovation and service delivery (Gerhart, 2017).

### **2.1.3 Enterprises Risk Management Theory**

The theory of Enterprise Risk Management (ERM) has become a crucial tool adopted by many businesses to effectively manage risks. The need for ERM has grown significantly over the last 20 years as a result of the increased focus on risk management. Gates (2006) suggests that ERM helps businesses operating in high-risk markets to minimize risks and improve performance. Risk management can be approached in two ways: partial or comprehensive. An enterprise risk management process involves addressing numerous threats simultaneously (ERM). Tseng (2007) defines ERM as a continuous and systematic technique for managing multiple hazards faced by corporations. According to Gordon et al. (2009), ERM is a strategy that involves analyzing, monitoring, and recognizing hazards that hinder a company's objective achievement. ERM can be implemented at all levels within a company's hierarchy. ERM takes into account a variety of risk management strategies employed by a company's risk manager, including intellectual assets, personnel, brand values, skills, business expertise, the regulatory environment, and the primary source of profit (Searle 2008). To remain in operation, businesses must strike a balance between meeting stakeholder expectations and managing risks. Risk is consistently monitored, and the risk manager is prepared to adjust strategies as necessary to maintain risks within acceptable limits. The concept of ERM reinforces the significance of risk management and highlights its practical application in eliminating risks within business environments.

### **2.1.4. Capital Asset Pricing Model**

The conclusions of portfolio theory are inextricably linked to the concept of risk. Sharpe and Lintner created the Capital Asset Pricing Model (CAPM) in 1964, which was later modified by Black in 1972. It is a simplified version of Markowitz's model (1952), which helped to build the risk-reward framework. According to Markowitz's model, the number of optimal portfolios is equal to the number of risk preferences exhibited by investors. Ideally, efficient portfolios should lie close to the mean-variance investment frontiers, where additional risk is required to achieve higher returns (Gossy, 2008). The CAPM takes this idea further by introducing a state of equilibrium. It posits that all investors, regardless of individual risk preferences, will hold the same efficient portfolio (the market portfolio) in pursuit of high returns. Consequently, the CAPM can estimate the market price of risk for a specific asset and provide an acceptable risk measure (Gossy, 2008). Over time, finance scholars have discovered anomalies in the CAPM, leading to debates about its applicability in the strategic management field. One such contribution came from Bettis (1983), who identified points of contention between finance and strategic management regarding the role of risk. Bettis highlights the impact of the CAPM on strategic management, particularly in the context of corporate risk management. He suggests an alternative perspective, arguing that business risks are connected to a firm's resources, competencies, and environmental operations. In contrast to the CAPM's recommendation, Bettis proposes that businesses should focus on specific risks they encounter in the market. He emphasizes the need for efficient portfolios that maximize returns while minimizing risk in order to implement Enterprise Risk Management (ERM) effectively.

### **2.2 Empirical Review**

Under this topic the previous studies that are relevant to financial risk hedging and financial performance are provided in order to present empirical evidence.

### **2.2.1 Forward Contract and Financial Performance**

Onchari, Moabe, and Onwonga (2020) investigated the relationship between forward contracts and the financial performance of publicly traded multinational corporations in Kenya. The study employed a descriptive cross-sectional methodology, concentrating on nine businesses in the energy and banking sectors. Three firms were specifically chosen from this group to serve as the study's sample. The inquiry gathered data from preexisting sources spanning the time frame of 2009 to 2018. The major findings underscored the substantial influence of forward contracts on the financial performance of businesses, underscoring their significance for market participants in managing future price fluctuations. This study focuses primarily on commercial banks listed on the NSE, which allows for a more diverse target and sample size than earlier studies on international firms. It is crucial to underline the distinction.

Miller and Podwol (2020) investigated the relationship between forward contracts, market structures, and the effect of mergers on welfare. The inquiry analyzed the relationship between mergers and their impact on the economy within wide-ranging market frameworks. The study determined that forward Contracts are essential for regulating market control and mitigating the effects of fluctuations in output levels on profitability. Furthermore, Vargas and Kessakorn (2013) carried out a study comparing forward contracts and options as strategies to reduce currency risk in globally diversified portfolios. Their research specifically examined U.S.-based investors and concluded that the utilization of currency futures for static hedging did not improve the overall performance of portfolios held by U.S. investors who had investments in other major nations. It is noteworthy that although previous investigations were undertaken in the United States, the present research was conducted in Kenya. Khakhar and Mittal (2015) conducted research on the role of hedging in risk management, with a focus on assessing the effectiveness of forward contracts in controlling foreign exchange risk in specific Indian enterprises. The study encompassed the timeframe of 2013 to 2014 and collected data from secondary sources, comprising a total of 100 entities. The results showed that companies widely employed forward contracts because of their capacity to effectively reduce foreign exchange rate risks. Contrastingly, the present investigation was carried out in Kenya, spanning from 2009 to 2019, with the aim of producing more reliable and consistent findings compared to the shorter timeframe of Khakhar and Mittal's study.

Yin and Han (2011) assessed the benefits and drawbacks of using forward contracts to hedge foreign portfolios. Their objective was to determine the circumstances under which forward contracts should be preferred over alternative strategies. The study demonstrated that leveraging future contracts can outperform the use of protective puts for foreign exchange hedging. It also highlighted the efficiency of forward contracts, recommending their primary use for hedging purposes. Similarly, Hasan (2015) studied how importer companies reduce importing costs by hedging foreign exchange risks using forward contracts and floating procedures. The study focused on international online retail stores and employed secondary data. Data analysis was conducted using Pearson chi-squared tests. The research revealed that using futures contracts to hedge foreign exchange risk resulted in lower daily transaction expenses. While the original study was conducted in China and may not be directly applicable to the Kenyan market, the current research was conducted in Kenya.

### **2.2.2 Future Contracts and Financial Performance**

Bin and Wen (2014) investigated the impact of introducing new futures contracts on the Chinese futures market. After two decades of growth, China's futures market has matured. It is crucial to evaluate the potential impact of new futures contracts on the existing ones. Investors

in the futures market closely monitor future price volatility, as it is a critical factor in setting futures contracts. This study looks at how recently announced futures categories affect the volatility of existing contracts. The study focuses on eight different kinds of metal futures traded on the Shanghai Futures Exchange. The findings show that introducing more futures contracts into the market reduces the price volatility of existing contracts. It is critical to note that this study was conducted in the Asian market and cannot accurately predict the scenario in the Kenyan market; nonetheless, this study will be conducted in Kenya. Yilgor and Mebounou (2016) investigated the effect of futures contracts on stock market volatility, focusing on persons linked with the Istanbul stock exchange. The purpose of this study was to examine the role of derivatives in mitigating risks associated with price volatility, interest rate variations, and foreign exchange rate changes as a result of deregulation and financial liberalization. Given the close relationship between derivatives markets and spot markets, experts must conduct a thorough analysis of the impact of derivatives on spot pricing changes. This study looked at how futures contracts affected the volatility and liquidity of the spot market between January 2001 and December 2014. The investigation used the EGARCH and ARMA models to investigate the relationship between futures contracts and changes in spot market conditions and liquidity. According to the data, participating in futures trading reduces the volatility of the spot market while having no effect on the trading volume of the spot market. Unexpected swings in future trading volume increase spot market volatility, but expected future trading volume has little effect on spot market volatility. The first study was conducted in Turkey, but this one was undertaken in Kenya.

Pok and Poshakwale undertook a study in 2004 to assess the impact of futures contracts on spot market volatility, with a focus on the Kuala Lumpur Stock Exchange. The purpose of this study was to look at how recently added futures contracts affected the volatility of spot markets in established and highly liquid marketplaces. The study aimed to investigate the impact of futures trading on spot market volatility by collecting data from both underlying and non-underlying companies in Malaysia's stock market. According to the findings, participating in futures trading in the spot market can have a positive impact on market volatility, notably the behavior of underlying equities in response to present conditions. The study also looked into the relationship between futures trading activity and spot market hazards. The VAR analysis reveals a transient but favorable relationship between futures trading activity and market volatility over a single day. The Granger causality test gives factual support for the claim. The inquiry took place in Kenya, and the study was conducted in Malaysia.

Islam and Chakraborti (2015) conducted a study on the use of futures and forward contracts as instruments for mitigating risk. Effective risk management is essential in today's volatile corporate landscape. Derivatives, including as futures and forward contracts, have been implemented as crucial instruments in financial advancements for the effective management of asset risks. Derivatives are effective methods for mitigating uncertainty and volatility related to underlying assets. This study especially examines futures and forward contracts, which are the predominant types of derivatives utilized in financial markets. They can be used to mitigate the consequences of price volatility in a wide range of financial assets, including stocks, fixed income instruments, commodities, currencies, interest rates, and market benchmarks.

### **2.2.3 Diversification of Currency and Financial Performance**

The study done by Pedrono (2017) aimed to investigate the correlation between financial volatility, currency diversity, and banking stability. The balance sheets of European global banks are significantly influenced by the US and Eurozone financial markets as a result of the global financial cycle. This paper provides an overview of the benefits of the global framework

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and highlights the specific conditions under which exposure to the foreign market helps to establish financial stability. The study commences by establishing a theoretical framework to elucidate the interplay of asset returns, funding costs, and currency rates in the context of bank stock volatility. It efficiently diversifies banks' balance sheets through the decomposition of each hedging method to reduce equity volatility. The current study employs the DCC-GARCH model to calculate and visually depict the fluctuations of the financial markets in the United States and Eurozone from 2000 to 2015. This research involves studying the conditional correlations between asset returns, funding costs, and volatility in exchange rates. The findings suggest that the existence of foreign currency exposure helps to reduce market volatility, especially during major financial crises such as the 2008 crisis. The inclusion of the currency component in a bank's balance sheet, along with the Basel III regulatory framework, provides a possible regulatory mechanism to strengthen bank resilience and understand the impact of foreign exposure on financial stability.

Maurer and Valiani (2007) conducted research on currency futures and currency options, specifically investigating the efficiency and effectiveness of different hedge strategies for managing currency risk in globally diversified mixed asset portfolios. The study examines the use of currency futures and currency options as hedging strategies. Data from the stock and bond markets of the United Kingdom, Germany, Japan, Switzerland, and the United States from January 1985 to December 2002 were examined for potential manipulation. This report includes the viewpoint of a German investor. The inclusion of options inside a portfolio presents difficulties for the conventional mean-variance method used in portfolio optimization, primarily due to the pronounced dispersion of returns associated with options. In order to tackle this matter, a mean-LPM model is employed. Furthermore, an examination is conducted on currency trends in order to ascertain the presence of a correlation between the temporal patterns of currency fluctuations and the prospective benefits derived from risk management strategies. This study looks at the association between currency diversity, a risk-mitigation technique, and commercial bank performance in Kenya. It differs from a prior study that looked at the effects of currency diversification on financial volatility in the European and American banking sectors.

Gnangnon (2021) conducted a study to investigate the relationship between currency rates and the diversification of services exports. The primary goal of this research was to investigate the relationship between currency rates and the diversification of service exports. The study used Generalized Methods of Moments (GMM) approaches to evaluate a sample of 125 nations from 1985 to 2014. The two-step Generalized Method of Moments (GMM) technique was used. The findings indicate that when the actual exchange rate falls, the diversity of service exports and the total number of service export lines increase in both high- and low-income countries. The findings emphasize the critical relevance of implementing appropriate real exchange rate strategies to promote the diversification of service exports across income levels. It is crucial to acknowledge that this study encompassed a substantial number of countries, including developing nations, which may have altered the results due to disparities in market development. Conversely, the research conducted in Kenya had a specific emphasis on the banking industry. Mwamba, Weirstrass, Djemo, and Raoul (2019) looked into how swings in foreign exchange rates effect a South African entrepreneur's business earnings while diversifying their overseas stock portfolio. The study quantified risk using the Value at Risk (VaR) model, which is based on the GJR-GARCH distribution. Data from 10 emerging stock markets were reviewed from January 1, 2000 to March 6, 2019, to draw conclusions about how fluctuations in foreign currency rates affect the returns of a South African investor's firm.

### **2.2.4 Swaps and Financial Performance**

In their 2010 study, Lorenzo and Cheng examined the effects of FX swaps on global financial stability and economy. The study demonstrated that foreign exchange swaps exert a substantial influence on both financial stability and the global economy, specifically within the banking industry as instruments for hedging and facilitating cross-border transactions. Nonetheless, the study did not provide precise details about the methodology used to demonstrate the association between foreign exchange swaps and financial stability. The current study aims to evaluate the impact of swaps on financial stability by employing rigorous research models that provide comprehensive insights within a global context. Torbira and Joshua (2016) looked into how financial derivatives affected the performance of both financial and non-financial businesses. The study ran from 2005 to 2014. The study aimed to assess the relationship between hedging activities and two financial indicators: Return on Assets (ROA) and Capital Employed. The study sought to investigate the effects of various financial derivatives on key performance indicators. To establish the association, researchers used a panel least squares regression model. The study's findings demonstrated a significant relationship between financial derivatives and performance, even though no explicit link was discovered in swaps. The first study was conducted within the boundaries of the United Kingdom, but the present study was undertaken in Kenya.

### **2.2.5 Bank Size, Risk Hedging and Financial Performance**

Nelly, Ambrose, and George undertook a 2019 study to investigate how bank size and trust in financial risk affect the financial performance of Kenyan commercial banks. The research findings, which were published in the Journal of Banking and Finance, shed insight on the relationship between these characteristics and the impact of macroeconomic conditions on bank performance. The study examined data from a broad sample of 43 commercial banks in Kenya using both a descriptive and a positivist methodology. Data were acquired from the Kenya Bankers Association and the Central Bank of Kenya, spanning 2009 to 2015. The relationship between variables was studied using the statistical software STATA, which took into consideration the panel data format and performed diagnostic tests. The study's findings show that banks' size has a substantial impact on their financial performance. Furthermore, the research focuses on Kenya's average asset return, which is comparable to that of Sub-Saharan Africa.

In a recent study, Muiro (2019) examined the hedging techniques used by publicly traded Kenyan companies to manage foreign exchange risk. The study investigated the effects of firm characteristics, corporate governance, and financial performance on these strategies. The research strategy included a combination of longitudinal and cross-sectional methods, including transaction cost theory, financial economic theory of risk management, international fisher effect theory, and purchasing power parity theory. The study examined the whole sample of 54 firms that had a regular presence on the Nairobi Securities Exchange between 2011 and 2016. The analysis made use of both primary data from cross-sectional studies and secondary panel data. The study used descriptive and inferential statistics with STATA software to examine the impact of hedging tactics, firm characteristics, and corporate governance on financial performance. The study discovered that the combined impact of these factors outweighed the effect of implementing currency risk hedging measures alone.

Muriithi (2016) investigated the effect of financial risk on the financial performance of Kenyan commercial banks. The study primarily focuses on the 43 commercial banks regulated by Kenya's Central Bank as of December 2014. The analysis relied on Time Series Cross Sectional

Unbalanced Secondary Panel data obtained from a range of sources, including the Central Bank of Kenya, the Kenya Banking Survey, and commercial banks' publicly available financial statements and accounts. The data covers ten years, from 2005 to 2014. To address constant, unobservable firm-specific factors and mitigate endogeneity difficulties, the study included financial ratio analysis and panel data methodologies such as random effects estimation, fixed effects estimation, and the generalized method of moments (GMM). The study investigated the relationships between variables using a number of statistical methods, including pairwise correlation analysis, the R2 coefficient of determination, and the Wald and F-tests. According to the test results, the fixed effects model outperformed the pooled OLS model. Furthermore, the tests showed that the random effects model is reliable. The findings indicated that credit, market, liquidity, and operational risks all had a significant negative influence on return on equity (ROE). Furthermore, the analysis identified the specific financial risk indicators that had the greatest impact on the cost-to-income ratio, hence altering the companies' overall financial performance.

### 2.3 Conceptual framework

A conceptual framework is a diagrammatical representation that shows the relationship between independent and dependent variables (Mugenda, 2018). The conceptual framework is presented in Figure 1.

#### Independent Variables

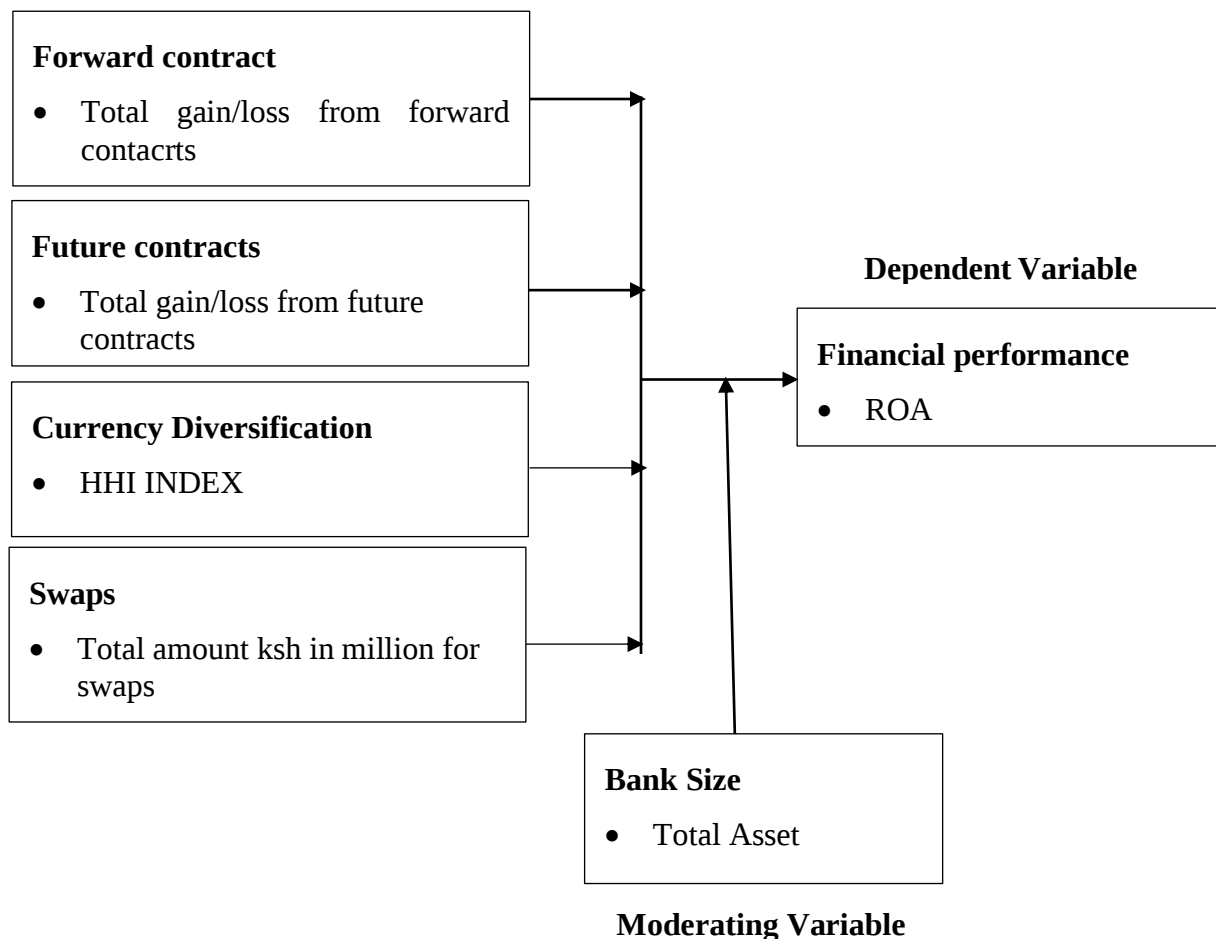


Figure 1: Conceptual framework

### 3.0 Research Methoedology

The study employed a positivist research philosophy to guide its approach to data collection and analysis, emphasizing objectivity and independence from the researcher's personal beliefs. This philosophy aligned with the study's goal of investigating the relationship between financial risk hedging and financial performance among publicly listed commercial banks in Kenya. The explanatory research design was chosen to explore causal relationships between variables, with a descriptive correlational approach facilitating the analysis of how financial risk hedging practices, such as forward contracts, future contracts, and currency diversification, impacted financial performance measured by return on assets (ROA). A panel regression model was utilized to test the hypotheses, providing insights into the influence of financial risk hedging strategies on bank performance over a five-year period from 2017 to 2021. The study also incorporated moderating variables, such as bank size, to examine their impact on these relationships. To ensure the reliability and validity of the results, diagnostic tests were conducted, including assessments for multicollinearity, heteroscedasticity, normality, and stationarity. The data analysis was performed using SPSS at a 0.05 significance level, with findings presented in tables and figures for clarity. Ethical considerations were a cornerstone of the study, ensuring compliance with research regulations and the proper attribution of scholarly work to avoid plagiarism. Secondary data was collected from publicly available sources, including annual reports, Central Bank of Kenya publications, and reports from the Kenya Bankers Association, providing a comprehensive dataset. By prioritizing ethical standards and employing robust statistical methods, the study produced credible insights into the relationship between financial risk hedging strategies and the financial performance of Kenyan commercial banks.

### 4.0 Research Findings and Discussions

This chapter covers data evaluation, descriptive statistics application, diagnostic test execution, and correlation analysis. Furthermore, moderation testing and regression analysis are carried out. A summary of the research findings and their interpretation is also provided in this chapter.

#### 4.1 Descriptive Statistics

Information was collected regarding the financial value of contracts involving bank investments, covering the period from 2017 to 2021. The study analyzed the financial performance, specifically using the ROA ratio as a measure. The assessment of currency diversification involved the utilization of the HHI index, along with the evaluation of investments in forward contracts, futures contracts, and swaps. Size has an effect on the relationship between risk minimization and financial performance. Table 1 includes descriptive statistics such as mean, standard deviation, minimum and maximum values, skewness, and kurtosis.

**Table 1: Summary of Descriptive**

|          | Observed | Minimum  | Maximum | Mean    | STD Deviation |
|----------|----------|----------|---------|---------|---------------|
| ROA      | 60       | -0.03    | 0.036   | 0.02    | 0.013         |
| HHI-CD   | 60       | 0.52     | 0.98    | 0.8211  | 0.12          |
| Forwards | 60       | 0.32     | 0.091   | 0.0028  | 0.014         |
| Futures  | 60       | 0.000006 | 0.0045  | 0.00043 | 0.00095       |
| Swaps    | 60       | 0.024    | 0.451   | 0.312   | 0.0062        |
| Size     | 60       | 10.88    | 14.08   | 12.76   | 0.75          |

Financial performance is determined by ROA. This ratio assesses how well management is able to produce results with the resources at its disposal. The mean for ROA is 0.020 and indicates that commercial Banks performed profitably with volatility of 0.013 hence minimum was -0.03 which was some banks not performed will and maximum of 0.036 indicates that some banks performed accordingly. The currency diversification was therefore determined by the Herfindahl Hirschman Index (HHI) which was calculated by determining the ratio of foreign currency held by the bank. The mean HHI index was 0.8211 with a standard deviation of 0.12. This is a high index indicating that the banks hold more of some foreign currency with just a few percentages of the others. The maximum of HHI was 0.98 showing some banks have more foreign currencies and few of local currency while 0.52 is the minimum and indicates also there is some banks that have less foreign currency compared to others. The forward contract of risk hedging had minimum of 0.000009 as shown above table 1 which indicate some banks invested in forward contract as risk hedging in small amount while the maximum of 0.091 indicate others bank invested will. The mean of forward contract is 0.0028 which indicate small investment of forward contracts of listed banks with standard deviation of 0.014. The valuation of futures contracts was determined by the reciprocal of the total investment made in these contracts. This had a comparable effect on shifting the measure's direction, resulting in a negative link between futures measure value and futures contract investment.

The futures contract had a mean value of 0.00043, a high value of 0.0045, and a minimum value of 0.000006. In contrast, swaps ranged from 0.024 to 0.450. An average value of 0.312 and a standard deviation of 0.0062 indicate that while most banks used swaps extensively, other institutions used them infrequently. This indicates a little degree of volatility. On the other hand, the study employed size as a moderating factor. This study set out to find out how the size of commercial banks affected the correlation between financial performance and risk hedging. Based on their total assets, Kenyan commercial banks are categorized into three groups according to their size. Banks are categorized into three groups by Muhindi and Ngaba (2018): Tier I, Tier II, and Tier III. The natural logarithm of the bank's total assets was used as a criterion to calculate the bank's size. The standard deviation was 0.75 and the reported mean was 12.76. 10.88 is the lowest limit and 14.08 is the highest.

## 4.2 Inferential Analysis

The table in section 4.2.1 presents the findings of the inferential analysis carried out utilizing Karl Pearson correlation. Examining the relationship between financial risk hedging, the independent variable, and commercial bank financial performance, the dependent variable, was the aim of this study. For inferential analysis, panel data is frequently utilized.

### 4.2.1 Correlations Analysis

The relationship between the variable is shown by the below result Karl Pearson matrix

**Table 2: Correlations analysis result**

|          | ROA   | HHI-CD | Forward | Futures | Swaps | Size |
|----------|-------|--------|---------|---------|-------|------|
| ROA      | 1     |        |         |         |       |      |
| HHI-CD   | 0.492 | 1      |         |         |       |      |
| Forwards | 0.563 | 0.569  | 1       |         |       |      |
| Futures  | 0.654 | 0.709  | 0.636   | 1       |       |      |
| Swaps    | 0.706 | 0.652  | 0.551   | 0.736   | 1     |      |
| Size     | 0.477 | 0.533  | 0.536   | 0.608   | 0.668 | 1    |
| OBS      | 60    | 60     | 60      | 60      | 60    | 60   |

Source: author 2023

The relationship between the performance of commercial banks listed on the National Stock Exchange and the practice of decreasing financial volatility is displayed in table 2. Return on assets (ROA) is favorably and significantly correlated with the HHI index, which gauges currency diversity. The forward, futures, and swaps, on the other hand, have positive correlations, suggesting a strong relationship between them. This suggests that financial performance is impacted by the usage of high-risk hedging instruments such currency diversifications, forward contracts, futures, and swaps. More specifically, the improvement in financial performance increases with the extent of hedging against risky scenarios. financial outcomes.

### 4.3 Diagnostic Test

Diagnostic tests were undertaken by the study, to determine whether statistical assumptions that are made while carrying out regression analysis are upheld by the data collected. The normality, multicollinearity, heteroscedasticity, and stationarity tests must be conducted in order to meet the statistical assumptions for regression analysis.

#### 4.3.1 Normality Test

The test statistic, degrees of freedom, and p-value are obtained from the Shapiro-Wilk normalcy test. It is not justifiable to reject the null hypothesis of normality in this instance if the estimated p-value is greater than the predefined significance level of 0.05. However, the null hypothesis can be disproved and the variable shown not to have a normal distribution if the p-value is less than the predefined significance level.

**Table 3: Normality Test**

|          | Tests of Normality              |    |      |              |    |       |
|----------|---------------------------------|----|------|--------------|----|-------|
|          | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |       |
|          | Statistic                       | df | Sig. | Statistic    | df | Sig.  |
| ROA      | .196                            | 60 | .952 | .826         | 60 | .567  |
| HHI - CD | .138                            | 60 | .632 | .931         | 60 | .765  |
| Forwards | .130                            | 60 | .756 | .960         | 60 | .876  |
| Futures  | .279                            | 60 | .675 | .710         | 60 | .673  |
| Swaps    | .283                            | 60 | .056 | .817         | 60 | .067  |
| Size     | .218                            | 60 | .976 | .862         | 60 | .0756 |

a. Lilliefors Significance Correction

Source: Researcher, (2023)

In the above tables shows that the variables exceed the 0.05 hence this shows that the null hypothesis is excepted.

#### 4.3.2 Multi-collinearity Test

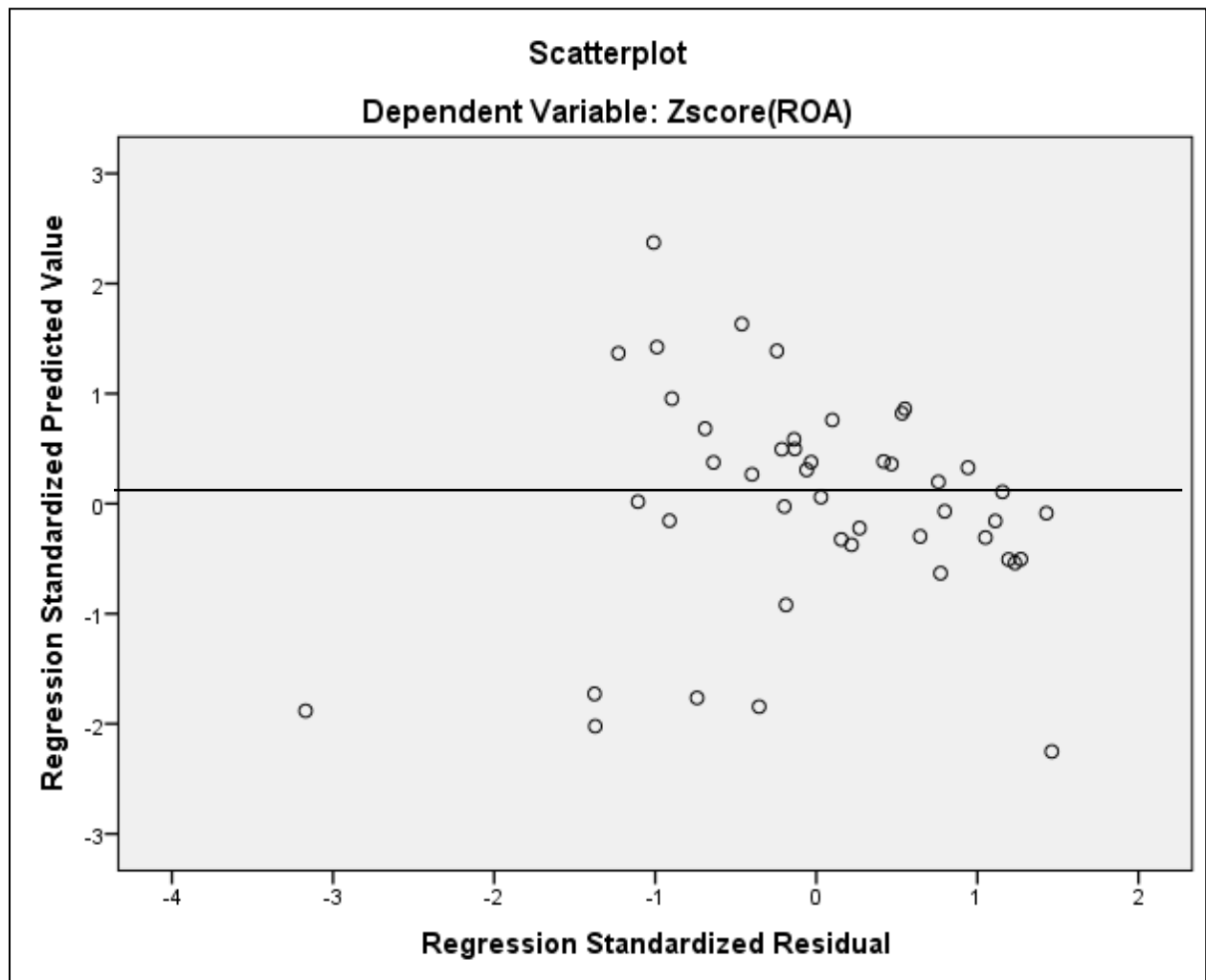
If the VIF is less than 9 then that VIF is accepted hence the table below shows that VIF is less than hence is not rejected and accepted

**Table 4: Collinearity Statistics**

| Model |                  | Collinearity Statistics |       |
|-------|------------------|-------------------------|-------|
|       |                  | Tolerance               | VIF   |
| 1     | (Constant)       |                         |       |
|       | Zscore: HHI – CD | 1.369                   | 7.207 |
|       | Forwards         | 1.437                   | 8.286 |
|       | Zscore(Futures)  | 1.130                   | 6.691 |
|       | Zscore(Swaps)    | 2.263                   | 7.807 |

#### 4.3.3 Heteroscedasticity Test

If errors in a regression model are not uniformly distributed at various predictor variable values, this can be determined statistically. In short, it's an assessment of whether the degree of mistakes in a dataset stays constant throughout all observations or if it changes depending on the values of the independent variables. Regression model precision may be impacted by heteroscedasticity, leading to imprecise regression coefficient estimations. Using robust standard errors, weighted least square regression, or changing the dependent or independent variables are some methods for reducing heteroscedasticity. Numerous methods, such as the Breusch-Pagan test, White's test, Park test, and scatterplot graph, can be used to conduct the assessment. The tests examine the relationship between the squared residuals and the predictor factors. A scatter graph plots the residuals versus the projected values. If there is no heteroscedasticity, the dots on the scatterplot should be evenly distributed around a horizontal line with zero residual values. When the dots form a pattern that differs from the horizontal line shown in figure 2, heteroscedasticity is present.



**Figure 2: Scatterplot Graph**

**Source: Researcher, (2023).**

The funnel-shaped pattern in figure 2 indicates the presence of heteroscedasticity, as it shows that the residuals have differing variances across the independent variable's whole range. Robust standard errors, weighted least squares regression, or altering the dependent or independent variables can all be used to overcome heteroscedasticity. Standardized values were utilized to fix the independent variables in order to mitigate the problem of heteroscedasticity in this research.

#### **4.3.4 Stationary test**

The primary objective of doing a stationarity test is to determine if time series data exhibits stationarity or non-stationarity. Trends, rather than only changes in external factors, might impact the variations in the variables in time series. Therefore, it is crucial to determine the stationarity of the data. A stationary time series is defined by a steady mean and variation over the whole period. Stationarity is required for regression analysis because non-stationary data can produce incorrect regression results. To achieve stationarity, data that is not stationary is modified further using procedures known as detrending. In this work, the Dickey-Fuller test was employed to determine panel data stationarity. When tested at a 5% level of significance (alpha), all variables in the Dickey-Fuller test have test statistics that exceed the crucial value

of 0.05. Consequently, it is suggested that the variables are stationary and the null hypothesis is rejected.

#### 4.4 Regression Analysis

A strong statistical method for determining the association between variables and forecasting future results is regression analysis. By creating a mathematical equation that accurately captures this relationship, regression analysis aims to ascertain the correlation between the dependent variable and one or more independent variables. A regression model with the following format was employed in the study:

$$ROA_{it} = \alpha + \beta_1 CD_{it} + \beta_2 F_{it} + \beta_3 f_{it} + \beta_4 S_{it} + \beta_5 Sz_{it} + \varepsilon$$

Where; ROA represents financial performance (Returns on Assets); CD represents currency diversification; F stands for Forward contract; f stands for future contract; S stands For Swaps

**Table 5: Regression Model Summary**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .853 <sup>a</sup> | .728     | .701              | .54665098                  |

a. Predictors: (Constant), Zscore(Size), Zscore: HHI - CD, Zscore(Forwards), Zscore(Futures), Zscore (Swaps)

As can be seen in Table 5, 72.8% of the variability in the dependent variable can be attributed to the independent variables in the model. It is important to note, nevertheless, that other factors are responsible for the remaining 27.2% of differences in financial performance that the model is unable to explain. A big standard error of the estimate of 0.55 and a goodness of fit of 70.1% when all independent variables are included indicate that there is a considerable connection between the independent and dependent variables in the model.

##### 4.4.1 Hypothesis test

Each independent variable's coefficient in the regression model indicates how relevant it is. The aggregate prediction power of the model's various variables accounts for its strength.

**Table 6: Hypothesis test table**

|       |                  | Coefficients <sup>a</sup>   |            |                           |       |       |
|-------|------------------|-----------------------------|------------|---------------------------|-------|-------|
|       |                  | Unstandardized Coefficients |            | Standardized Coefficients |       |       |
| Model |                  | B                           | Std. Error | Beta                      | t     | Sig.  |
| 1     | (Constant)       | -2.284E-16                  | .129       |                           | .000  | 1.000 |
|       | Zscore(Forwards) | .652                        | .197       | .652                      | 3.312 | .002  |
|       | Zscore(Futures)  | .376                        | .361       | .376                      | 1.041 | .0003 |
|       | Zscore: HHI - CD | .352                        | .214       | .352                      | 1.643 | .0021 |
|       | Zscore(Swaps)    | .417                        | .254       | .417                      | 1.641 | .0041 |

Source: Author

The aforementioned table demonstrates the robust correlation between financial performance and financial risk hedging. It makes it clear that the financial performance of commercial banks listed on the NSE is impacted by the Financial Risk Hedging variables.

#### **4.4.1.1 Hypothesis test one**

The study looked into the null hypothesis, which states that forward contracts have no discernible impact on financial performance. Table 6 shows that the Forward contract has a P-value of 0.002. The null hypothesis is rejected since the P-value is less than 0.05. This demonstrates how the financial performance of commercial banks listed on the NSE is significantly impacted by forward contracts. This result is consistent with that of the Onchari and Onwonga research (2020), which found a relationship between forward contracts and the Kenyan multinational companies' financial performance. The results align with the research conducted by Miller and Powdwool (2020) on the correlation between market structure and forward contracts, as well as the study conducted by Khakhar and Mittal (2015) on financial risk hedging through the use of future contracts and foreign exchange.

#### **4.4.1.2 Hypothesis test two**

The future contract's P-Value is 0.003, which is less than 0.05, as Table 6 demonstrates. This shows that the null hypothesis is rejected and that the future contract has a significant impact on the financial performance of commercial banks listed on the NSE. The results of this investigation align with those of Bin and Wen (2014), who examined the effects of incorporating future contracts in Chinese markets. Future contracts' effects on stock market volatility were studied by Yilgor and Mebounou (2016), future contracts' effects on spot market volatility by Pok and Pokshakwale (2004), and future contract and forward contract use as risk mitigation strategies by Islam and Chakrabort (2015).

#### **4.4.1.3 Hypothesis test three**

Table 6 shows that the HHI-CD currency diversification index has a P-value of 0.0021. The null hypothesis is rejected because this is less than 0.05, suggesting that currency variety influences the financial performance of commercial banks listed on the NSE. Pedrono's (2017) research on the relationship between financial volatility, currency diversification, and bank stability is in line with this finding. Research on currency futures and currency options was carried out by Maurer and Valiani (2007), who specifically looked into the efficacy and efficiency of several hedge strategies for managing currency risk in mixed asset portfolios that are globally diversified.

#### **4.4.1.4 Hypothesis test Four**

The swaps' P-Value of 0.0041, which is less than 0.05, is shown in table 6, and as a result, the null hypothesis is rejected. This implies that swaps have a big influence on commercial banks' financial results. This result is in line with the research conducted by Torbira and Joshu (2016), who looked into how financial derivatives affected the performance of both financial and non-financial organizations, as well as the study conducted by Lorenzo and Cheng (2010), which examined the effects of FX swaps on the economy and global financial stability.

### **4.5 Moderating Effects of Size**

By examining the link between the independent variables and the moderator variable, this study seeks to assess the impact of size. The size variable modifies the relationship between the independent and dependent variables, as indicated by a statistically significant interaction term ( $p\text{-value} < 0.05$ ).

Following a review of the independent component, moderator variable, and interaction term coefficients. Considering the moderator variable, the independent variables' coefficients show how directly they affect the dependent variable. While accounting for the effects of the

independent variables, the moderator variable's coefficient estimates the direct impact of size on the dependent variable. The impact of the interaction between the moderator and independent variables on the dependent variable is computed using the interaction coefficient.

$ROA_{it} = \alpha + \beta_1 F_{it} + \beta_2 Sw_{it} + \beta_3 CD_{it} + \beta_4 BZ + \epsilon + \beta_5 (F_{it} * BZ) + \beta_6 (Sw_{it} * BZ) + \beta_7 (CD * BZ) + \beta_8 (F_{it} * BZ) + \epsilon$   
 Where; BZ= Bank Size; F\*BZ= Interaction Between Forward Contract and Bank Size; Sw\*BZ= interaction between Swaps contract and Bank Size; CD\*BZ= interaction between currency diversification and bank size; F\*BZ= Interaction between Future and Bank Size

**Table 7: Interaction Coefficients**

|       |                  | Coefficients <sup>a</sup>   |            |                           |        |      |
|-------|------------------|-----------------------------|------------|---------------------------|--------|------|
| Model |                  | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|       |                  | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)       | -.497                       | 5.952      |                           | -.084  | .934 |
|       | Zscore(Forwards) | .058                        | .150       | .058                      | .390   | .699 |
|       | Zscore: HHI - CD | -.190                       | .139       | -.190                     | -1.363 | .181 |
|       | Zscore(Swaps)    | -.183                       | .142       | -.183                     | -1.288 | .206 |
|       | BZ               | .045                        | .465       | .034                      | .096   | .924 |
|       | InteractionZF    | -.268                       | .237       | -.340                     | -1.131 | .265 |
|       | InteractionZCD   | .226                        | .348       | .251                      | .649   | .520 |
|       | InteractionZSW   | -.217                       | .409       | -.181                     | -.531  | .598 |

a. Dependent Variable: Zscore(ROA)

Source: Researcher, (2023)

P-values greater than 0.05 are found for all interaction factors between size and forward contracts, currency diversification, and swaps, suggesting no significant interaction between size and independent variables. Therefore, the analysis indicates that there is no size-related difference in the association between risk hedging and financial performance of Kenyan listed commercial banks.

**Table 8: Moderating Effects of Size**

| Model           | Unstandardised Coefficients |            | Standardised Coefficient |        | Significant |
|-----------------|-----------------------------|------------|--------------------------|--------|-------------|
|                 | B                           | Std. Error | Beta                     | t      |             |
| Forward         | 0.058                       | 0.015      | 0.058                    | 0.392  | 0.004       |
| HHI-CD          | 0.191                       | 0.0139     | 0.191                    | 0.363  | 0.0181      |
| Swaps           | 0.183                       | 0.0142     | 0.183                    | 0.288  | 0.0206      |
| Futurs          | 0.068                       | 0.0423     | 0.068                    | 0.382  | 0.0042      |
| BZ              | 0.045                       | 0.0465     | 0.034                    | 0.096  | 0.924       |
| interaction ZF  | 0.0268                      | 0.0237     | 0.034                    | 0.0131 | 0.0265      |
| nteraction ZF   | 0.0352                      | 0.0364     | 0.032                    | 0.0132 | 0.0364      |
| interaction ZCD | 0.026                       | 0.0348     | 0.0251                   | 0.0449 | 0.0431      |
| interaction ZSW | 0.0217                      | 0.0409     | 0.0181                   | 0.0331 | 0.0241      |
| Constant 1      | 0.497                       | 0.952      |                          | 0.084  | 0.934       |

Source: Researcher

The table above depicts the interaction between bank size and the independent variables of forward, future, swaps, and currency diversification. The interaction values are smaller than 0.05, indicating that the bank size influences the independent variable due to substantial associations.

## **5.0 Conclusion**

The study concludes that financial risk hedging strategies are strongly correlated with the financial performance of commercial banks. The findings reveal that employing riskier hedging techniques significantly enhances financial performance, making such practices essential for maintaining competitive and stable banking operations. Forward contracts were identified as having a substantial impact on financial performance, highlighting that increased use of these contracts helps commercial banks achieve better operational outcomes and sustain the required rate of return on equity. Similarly, future contracts positively influence financial performance, with higher levels of future contracts linked to improved equity returns. This underscores the value of incorporating futures into hedging practices to bolster financial stability and growth. Currency diversification emerged as another impactful hedging strategy, demonstrating that greater variety in currency usage within the financial system, particularly among commercial banks, is associated with improved financial performance. This efficiency stems from the ability of currency diversification to mitigate adverse performance implications, solidifying its role as a viable risk management approach. Additionally, swaps showed a strong and positive correlation with the financial performance of NSE-listed commercial banks, proving their effectiveness as a hedging tool. Increased use of swaps was shown to enhance financial performance, emphasizing their utility in stabilizing banking operations amidst market uncertainties. The study further confirms that financial risk hedging tools collectively have a significant and positive effect on the performance of commercial banks. These findings provide valuable insights for commercial banks and financial institutions aiming to maximize their profitability and sustain operational efficiency. By leveraging hedging techniques such as forward contracts, futures, currency diversification, and swaps, banks can enhance their financial stability and achieve better returns, supporting their overall growth and resilience in the dynamic financial landscape.

## **6.0 Recommendations**

The study recommends that bank executives and stakeholders should prioritize the adoption of risk management approaches and diversification strategies to enhance financial performance in the banking industry. These insights highlight practical strategies for improving financial performance and stability, particularly in Kenya's banking sector. To mitigate or eliminate financial market risks, bank management should actively employ financial risk hedging techniques, given the significant association observed between financial performance and hedging variables. The Central Bank of Kenya (CBK) should establish comprehensive regulations to oversee the use of high-risk financial hedging products to improve the effectiveness and safety of derivatives. Additionally, banks should be required to disclose the financial derivatives they use in their financial statements to promote transparency and accountability. The government should also create supportive policies to encourage the use of financial derivatives, as these tools have been shown to enhance the performance of commercial banks. Such measures would not only improve the viability of financial institutions but also contribute to the growth and stability of the national economy.

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