FOREIGN EXCHANGE RISK HEDGING TECHNIQUES, FIRM SPECIFIC FACTORS, CORPORATE GOVERNANCE AND FINANCIAL PERFORMANCE OF LISTED FIRMS IN KENYA

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DECLARATION AND RECOMMENDATION

Declaration

I, the undersigned, declare that this thesis is my original work and has not been submitted to any other university, college or institution of higher learning for the award of a degree.

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DEDICATION

It is with tremendous gratitude that, I dedicate this thesis to my parents, the late Raphael Kamande and Rosalia Wangeci Kamande, who instilled in me the value of education and hard work.

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ABSTRACT

Globalization, international trade and Kenya's floating foreign exchange rate regime have exposed Kenyan firms to foreign exchange risk. Some Kenyan firms have embraced risk-hedging techniques to mitigate any losses potentially arising from the volatility of the Kenyan shilling, while others have not. Against this background, this study sought to assess the effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya. The specific objectives were: first, to determine the effect of foreign exchange risk hedging techniques on financial performance; second, to establish whether firm-specific factors mediate the relationship between foreign exchange risk hedging techniques and financial performance; third, to determine the moderating effect of corporate governance on the relationship between foreign exchange risk hedging techniques and financial performance; lastly, to establish whether the joint effect of foreign exchange risk hedging techniques, firm-specific factors and corporate governance on the financial performance was significantly greater than the effect of exchange hedging techniques on financial performance. The study was grounded on the financial economic theory of risk management, the purchasing power parity theory, international fisher effect theory and the transaction cost theory. Longitudinal and cross-sectional research design was used. The target population constituted all the 54 firms that were continuously listed on the Nairobi Securities Exchange during the study period, between 2011 and 2016. Panel secondary data and cross section primary data were used in the study. The data was analyzed using descriptive and inferential statistics, with the aid of STATA software. Feasible Generalized Least Squares model was used to test the hypotheses. The results revealed that: first, hedging techniques had a significant effect on financial performance; secondly, firm-specific factors mediate the relationship between hedging technique and financial performance; third, corporate governance moderates the relationship between hedging techniques and financial performance. Lastly, the findings also confirmed that the joint effect of hedging techniques, firm specific factors and corporate governance on the financial performance was greater than the effect of exchange risk hedging techniques on financial performance. The study makes the following recommendations: first, the Nairobi Securities Exchange and the Capital Markets Authority should expedite the development of the derivatives markets, so that the hedging instruments are easily available. Second, the government should create an enabling environment that will help Kenyan firms increase their asset base hence their size. Lastly, there should be concerted efforts by all stake holders to uphold, encourage and strengthen good corporate governance practices of Kenyan firms.

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ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms are used throughout this thesis.

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criteria
BIC	Bayesian Information Criteria
BLUE	Best Linear Unbiased Estimation
CMA	Capital Markets Authority
ETFs	Exchange Traded Funds
FCDs	Foreign Currency Derivatives
FE	Fixed Effects
FERH	Foreign Exchange Risk Hedging
FGLS	Feasible Generalized Least Squares
FOMS	Futures and Options Market Segment
FSF	Firm Specific Factors
FX	Forex Markets
GAAP	Generally Accepted Accounting Principles
IFE	International Fisher Effect
IFRS	International Financial Reporting Standard
LOWESS	Locally Weighted Scatterplot Smoothing
LR	Likelihood Ratio
LSE	London Stock Exchange
MIMS	Main Investment Market Segment
MSCI	Morgan Stanley Capital International
NACOSTI	National Commission for Science, Technology and Innovation
NSE	Nairobi Securities Exchange
OLS	Ordinary Least square
PPP	Purchasing Power Parity
RE	Random Effects
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
ROS	Return on Sales
TOPIX	Tokyo Stock Price Index
TWI	Trade Weighted Index

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Risk is an integral component of any business and it can negatively impact the financial performance of a company. In the worst-case scenario, a risk that is not addressed can drive a company out of business. It is therefore critical for any business to aggressively manage risk to survive in the competitive and volatile global business environment. Globalization, floating foreign exchange rate regimes and international trade expose firms to foreign exchange risk. Foreign exchange risk refers to situations in which movements in exchange rates affect the financial performance of firms. Ito, Koibuchi, Sato and Shimizu (2013) describe foreign exchange risk as the sensitivity of a firm's cash flows to unanticipated changes in foreign exchange rates. Foreign exchange risk, also commonly referred to as currency risk is more pronounced in businesses that deal with more than one currency, through imports and exports. This risk can negatively impact the financial performance of a firm, for example, depreciating home currency can increase cost of imports, cost of servicing foreign debts, and cost of investing overseas. Similarly, appreciating home currency can make exports more expensive and less competitive in the international markets. In addition, appreciating home currency can decrease the value of foreign investments, foreign monetary assets and reduce the value of revenue from exports and incomes from abroad when the income is converted into home currency. The volatility of home currency can lead to decreased profitability, which can lead to a fall in the market value of a firm. If volatility lasts long and prevents or delays the exchange rates from resetting to their original state, the resulting trade patterns disturb the stream of expected returns by raising the probability of loss for the traders concerned (Khan, Azim, & Syed, 2014).

There are three types of foreign exchange risk: transaction, translation and economic exposure. Transaction risk arises when a firm faces contractual cash flows that are fixed in a foreign currency (Shapiro, 2013). If a firm has a receivable or a payable denominated in foreign currency, a change in the value of the foreign currency will increase or reduce the expected future cash flows. If the firm does not address this uncertainty, then the firm's market value will be affected. Applying financial and natural hedging strategies can reduce transaction exposure. Economic exposure refers to the impact of exchange rate movements on the present value of expected future cash flows (Döhring, 2008). It is concerned with the effect of long-term movements in exchange rates on the firms' expected future cash flows

and, in turn, their overall market values (Dhanani, 2003). Economic risk is sometimes considered to be an extension of transaction exchange risk, since it is related to future expected cash flows (Dhanani, 2003). Earlier empirical studies on economic exchange rate risk indicated that many firms did little to manage economic risk because it is harder to manage. However, recent studies show firms are actively managing economic risk using natural hedging (Döhring, 2008).

Translation exposure refers to the effect of an unanticipated change in exchange rates on the value of foreign subsidiaries' assets and liabilities dominated in foreign currency, when these values are being translated into home currency on the consolidated financial statements of a firm (Shapiro 2013). The process of translation, combined with movements in exchange rates, may result in translation gains or losses in the financial statements when firms balance the financial statements. These gains and losses are commonly termed as translation risk (Dhanani, 2003). Translation exposure can be controlled through a balance sheet hedge and derivatives hedge. This study focused on transaction and economic exchange rate risks because majority of Kenyan firms do not have international subsidiaries and hence there are minimal translation gains or losses to deal with in their financial statements.

Theoretical and empirical studies have established a nexus between foreign exchange risk hedging, the financial performance and ultimately the value of the firm. This relationship can also be influenced by many factors, some within the control of the management, and others beyond the control of the management. Allayannis and Weston (2001); Bartram, Brown and Fehle (2004); and Carter, Rogers and Simkins (2006) assessed the use of financial derivatives for hedging purpose, found that hedging improve financial performance as well as increases shareholder's wealth. Treanor, Carter, Rogers, and Simkins (2013) evaluated the utilisation of natural and operational hedging by airlines and found that the use of operational hedging does not increase the firm's value. On the other hand, Dong, Kouvelis and Su (2014) found that operational hedging improves the profitability of the firm.

The relationship between foreign exchange risk hedging and financial performance can be influence by many factors. Gekara (2014) found that the minimal use of derivatives in Kenya is due unfavourable political environment, limited knowledge of derivatives, underdeveloped financial infrastructure, and foreign competition. These factors are beyond the management's control. Solakoglu (2005) found that the size of the firm and the level of international transactions influences exposure to foreign exchange risk, the hedging techniques applied and

the financial performance. Contrary, Al-Momani and Gharaibeh (2008) in his study on foreign exchange risk management practices of Jordanian firms, found no between size of the firm, legal structure and the risk management practices. However in regard to economic exposure the study found positive relationship between the firm size, international business environment, legal structures and financial performance of the firm. Chaudhry, Mehmood and Mehmood (2014) found that there is a significant relationship between foreign purchases, liquidity, firm growth, size and derivative usage.

Corporate governance is another factor that can influence the relationship between foreign exchange risk hedging techniques and financial performance. Allayannis, Lel and Miller (2012) found that hedging has positive impact on firm's performance and that corporate governance is an important factor in determining hedging policies and techniques. Osuoha et al. (2015) in his study of African non-financial firms, found that corporate governance has a strong impact on derivative usage. Ahmed, Azevedo and Guney (2015) found that corporate governance has a strong influence on the risk management decisions. This study assessed the effect of foreign exchange risk hedging techniques on financial performance, as well as evaluated how firm specific factors, corporate governance influence the relationship between the dependent (financial performance) and independent variables (foreign exchange risk hedging techniques).

1.1.1 Foreign Exchange Risk Hedging Techniques

Foreign exchange hedging techniques are measures undertaken by a firm to manage or deal with the exchange risk. There are two ways of classifying foreign exchange risk hedging techniques, according to hedging literature, and according to financial statements (Döhring, 2008). The hedging literature classifies the techniques into financial and operational. Financial hedging techniques involve the use of financial derivatives like: forwards, futures, money market hedge, swaps, options and foreign currency debt (Shapiro, 2013). On the other hand, the operational hedging techniques include measures like: diversification across countries, operational matching of revenues and expenditure, netting inter-firm cash flows, currency choice in invoicing, leads and lags. The financial statement classification classifies the techniques into derivative and natural hedge. The natural hedge includes foreign currency debt hedge and operational hedge. This study adopted the classification according to financial statement classifications, because most Kenyan firms use natural hedging.

Forward contract is an agreement between two parties regarding the delivery of an underlying asset for a specified delivery price at a specified future date. The underlying asset can be foreign currency or a commodity. Forward contracts are privately negotiated agreements between two parties and do not necessarily have standardized contract size and maturity (Liu, 2007). Futures contracts are different from forward contracts because they are standardized and are traded in organized exchange. Futures contracts were initially designed for commodity trading, but as trading continued to evolve, the initial definition of "commodity" broadened to include exchange currencies (Liu, 2007). Currently, currency futures contracts are the most commonly used financial derivatives by international investors.

Money market hedge involves the simultaneous borrowing and lending activities denominated in two different currencies aimed at locking-in the value of the home currency against the value of a foreign currency cash flow (Shapiro, 2013). The simultaneous borrowing and lending activities enable firms to create homemade forward contracts. The money market and forward market are identical because interest rate parity holds (Liu, 2007). Currency swaps, on the other hand, are contracts where two parties agree to exchange specified cash flows denominated in different currencies at specified intervals. Currency options are contracts that give the holder the right, but not the obligation, to buy or sell a specified amount of foreign currency at a specified price for a specified period of time (Sundaram & Das, 2010). There are two types of currency options; currency put option and currency call option. The put option gives the holder the right to sell specified amounts of foreign currency, at a specified period of time. A currency call option, on the other hand, gives the owner the right, but not the obligation to buy foreign currency at a specified price, at a specified period of time (Shapiro, 2013).

Natural hedging is a method of minimizing exchange risk through using different financial and non-financial strategies whose performance tends to cancel each other. The most commonly used natural hedging strategies include: diversification across countries; matching costs and revenues; choice of invoice currency; netting inter-firm foreign exchange cash-flows; price adjustments; leading and lagging; and borrowing in foreign currency. The firm can shift, share or diversify foreign exchange risk by selecting the currency of invoice, for example a firm may decide to invoice all transactions in the home currency to avoid transaction exposure all together. In addition, if the currencies of both the importer and exporter are not suitable for settling international trade, neither party can share or shift the exchange risk (Eun & Resnick, 2006). Price adjustment technique involves changing price to

gain from exchange rate changes (Al-Shboul, 2008). When the home currency of a subsidiary depreciates, the subsidiary can increase prices of exports to cancel the effect of depreciation. This technique is difficult to implement because it requires some signalling and timing of exchange rate changes and firms cannot arbitrarily change prices without considering the actions of competitors.

Leading and lagging is another natural hedging technique used by firms to minimize transaction exposure. According to Abor (2005) lead strategy involves attempting to collect foreign currency receivables only when a foreign currency is expected to depreciate and paying foreign currency payables before they are due when a currency is expected to appreciate and vice-verse. To "lead" means to pay the currency payables or collect currency receivables early. To "lag" means to pay the foreign denominated payables or collect the foreign denominated receivables when the foreign currency is appreciating. Firms normally “lead” soft currency receivables and “lag” hard currency receivables, to avoid loss from the depreciation of the soft currencies and to gain from the appreciation of hard currencies. The lead and lag strategy can be applied more effectively when dealing with intra-firms payables and receivables since the management of various subsidiaries are assumed to be working for the good of the entire organization.

Exposure netting involves gathering all foreign currency cash flows from subsidiaries and grouping them together, so that the inflows are used to offset the outflows of the same currency (Eun & Resnick, 2006). The firm then hedges the balance between the inflows and outflows. Firms that aggressively use exposure netting normally centralized their exposure management function by using re-invoice centres. Cross hedging is a technique used when there is no possibility of using financial derivatives or when they are no financial derivatives available. The firm planning to use cross hedging seeks an alternative, by identifying a specific foreign currency, whose exchange rate is highly correlated to the home currency or the currency to be hedged. Then the firm uses either forward, futures, or an option position on this currency. For cross hedging to be effective, the two currencies must be strongly correlated (Eun & Resnick, 2006).

This study sought to assess the effect of foreign exchange risk hedging techniques on financial performance. Following the financial statement classifications, the independent variable was categorised into two dimensions; financial hedging and natural hedging. The most commonly used financial derivatives in Kenya are forwards and swaps, while the

commonly used natural hedging technique is the choice of the currency of billing (Chiira, 2009).

1.1.2 Financial Performance

Financial performance refers to the extent to which financial objectives and economic goals of a firm are being met (Richard, Devinney, Yip & Johnson 2009). Financial performance is measured in various ways including stock market based and accounting based measures. The two measures represent different perspectives of evaluating a firm's financial performance. However, they have different theoretical implications and may be subject to particular biases (Hillman & Keim, 2001). The most common accounting measures of firm's profitability are: return on total assets (ROA), return on equity (ROE), return on sales (ROS) and return on capital invested (ROI). The most common market based measures include Tobin's Q and market return. Accounting measures are deemed to be a reflection of past and short-term financial performance while market measures reflect the future or long-term financial performance (Richard et al., 2009). Both accounting based and market measures are widely accepted and used as valid indicators of a firm's financial performance (Gentry & Shen, 2010).

This study adopted the market measures, Tobin's Q for various reasons. First, the market based measures are futuristic, compared to accounting measures which focus on the historical performance of a firm. Second, Tobin's Q is an indicator of the firm's future performance, hence its value. This study focused on the financial performance, the value of the firm and ultimately shareholders' wealth maximization, which is the ultimate criterion for fulfilment of economic goals of an organization (Gentry & Shen, 2010). Lastly, market based measure was used because they are not easily interfered with, compared to accounting measures which can be manipulated and distorted due to different accounting policies; and the treatment of certain revenue and expenditure items (Gentry & Shen, 2010). The most common market measures are market-to-book value ratio, Tobin's Q and market return. According to Combs, Crook and Shooke (2005) market based measures yield the same results whether they are used together or separately. Guided by these finding, this study employed Tobin's Q as a measure of financial performance.

1.1.3 Firm Specific Factors

Firm specific factors (FSF) refer to those aspects of a firm that can be controlled by the company's management. These factors are influenced by the firm's management capabilities,

experiences and performance. FSF like firm size, firm maturity, leverage, foreign sales, investment opportunities, liquidity and geographical diversification, among others can influence Foreign exchange risk hedging techniques and financial performance (Allayanis & Ofek, 2001). Large companies are expected to have significant exposure to foreign exchange risk and it is believed that these companies aggressively manage the risk, since they enjoy economies of scale, have risk management expertise and have access to sophisticated hedging tools (Bodnar & Wong, 2000).

Firm maturity, measured by the number of years the company has been in existence, influences the degree of a firm's exposure to currency risk and hedging decisions. Older firms have the knowledge and resources to manage risk; hence mature firms are likely to hedge, lowering currency risk exposure (Solakoglu, 2005). Firms with large amounts of local currency and foreign denominated debt are exposed to the risk of bankruptcy, which introduces and increases costs of financial distress. Kim and Krapl (2014) suggested that borrowing in foreign currencies can be very risky due to foreign exchange volatility rates, and may lead to financial distress and bankruptcy. Firms are likely to engage in hedging to minimize the costs associated with financial distress and bankruptcy. Hunter (2005) found that highly levered firms that do not hedge are likely to experience financial distress because of adverse exchange rate movements which weaken their ability to meet interest payments.

Companies that are directly or indirectly involved in international trade are likely to be affected by foreign exchange rate fluctuations. For example, export oriented firms with foreign sales benefit when the home currency depreciates while import oriented firms suffer losses when the local currency depreciates. On the other hand, export oriented firms may incur loses when the home currency appreciates. Engaging in international transactions increases the probability of foreign exchange exposure and hedging tends to minimise the risk (Varga, 2015). Pantzalis, Simkins and Laux (2001) pointed out that U.S multinational firms with many international branches are diversified operationally and tend to have minimal currency exposure. The level of liquidity also influences the hedging activities. High liquidity levels enable firms to cover financial and operational liabilities, reducing the probability of using financial derivatives. High liquidity, particularly holding dollarized liquidity, is an effective but costly way of preventing adverse effects of foreign currency volatility. Marsden and Prevost (2005) found evidence that the presence of liquid assets reduces the need for hedging with derivatives.

This study sought to assess the mediating effect of selected FSF on financial performance for two reasons. First, firm size, leverage ratio, liquidity, and the age of the firm have been found to have a positive impact on financial performance. This is because large mature firms have more stable or has less volatile cash flows (Kaya, 2015). On the contrary, other studies do not support these findings. Bhutta and Hasan (2013) found that tangibility and growth have positive but insignificant effects on profitability. The study also found insignificant negative relationship of leverage ratio on the profitability of the firm. Second, from the broad diversified empirical evidence, size, age, leverage, liquidity and geographical diversification are the major FSF that influence performance. This study selected these factors to answer the question of whether or not these selected FSF do influence the financial performance of firms in developing countries and consequently whether conclusions can be drawn about the importance of firm-specific factors in policy formulation.

1.1.4 Corporate Governance

The decisions of whether to hedge or not to hedge and the decisions about the hedging techniques to be adopted, are both influenced by the corporate governance. Corporate governance is concerned with the structures of the board, the organisation's processes and systems that drive the organisation towards the attainment of its set goals (Osuoha, Samy & Osuoha, 2015). The board of directors and board committees provide guidance and oversight of the corporate governance process. The board of directors acts on behalf of shareholders; therefore, the size, composition, number of independent directors, CEO duality and ownership structure of the board can strengthen or weaken the use and effectiveness of hedging techniques. The ownership structure provides an indicator of who owns majority shares, whether internal or external large block holder. External block holders are mainly institution investors, while internal large block holders involve family ownership. Firms with large institutional investors have strong financial incentives and large stakes therefore they are likely to encourage hedging. On the contrary, Hagelin, Holmen, Knopf, and Pramborg (2007) found that when family members hold the largest stake, hedging activities are not given top priority. There is a high probability that firms with strong corporate governance do hedge and are likely to use financial derivatives for hedging purposes and not for speculation (Allayannis, Lel & Miller, 2012).

1.1.5 Nairobi Securities Exchange

The Nairobi Securities Exchange (NSE) was established by the Britons in the 1920s. The exchange had no trading floor, with the buying and selling of shares done through

gentleman's agreement. Currently, NSE is the fourth largest securities exchange in the sub-Saharan Africa and it offers diversified products, for investment and hedging purposes. The exchange plans to offer new derivative products like Equity index futures and single stock futures. The availability of these hedging products will promote hedging activities in Kenya.

Securities markets play a significant role in foreign exchange risk management by availing hedging instruments. According to Murungi, Murage and Wanjau (2014) securities markets facilitate financial risk management, since these markets provide instruments that enable investors to transfer risk. These markets contribute to the efficient capital allocation, cross-border capital flow, portfolio diversification, risk transfer, amongst other functions (Ilyina, 2004). Empirical studies show that there is limited foreign risk management by Kenyan firms, probably due to the cost involved and absence of some of derivative products in the Kenyan market. Chiira (2009) found that only 35 percent of Kenyan firms use derivatives to manage foreign exchange risk. However with the introduction of derivative instruments on the bourse, the NSE will be instrumental in promoting hedging activities.

1.1.6 Exchange Risk Hedging Techniques and Financial Performance of Listed Firms in Kenya

Listed and non-listed firms in Kenya are exposed to foreign exchange rate risk through imports, exports and international financial transactions. Foreign exchange risk can affect the firm's expected cash flows, the value of assets and liabilities denominated in foreign currency, the firm's profitability and the ultimately firm's value. The profitability of firms operating in Kenya has been affected by the volatility of the Kenyan shilling. For example, during the period under study, 2011 to 2016, the Kenyan shilling recorded volatility against the major currencies especially the US dollar, the sterling pound and the Euro (Appendix IV). The Kenyan shilling exchange rate to one US dollar (end of year figures) was Ksh 85.07 per dollar, Ksh 86.03 per dollar, Ksh 86.31 per dollar, Ksh 90.59 per dollar, and Ksh 102.31 per dollar respectively in the years 2011, 2012, 2013, 2014 and 2015 respectively (CBK, 2017). Similarly, The Kenyan shilling exchange rate to one Sterling pound (end of year figures) was Ksh 131.12 per pound, Ksh 139.02 per pound, Ksh 142.4 per pound, Ksh 140.95 per pound, and Ksh 151.80 per pound respectively over the years 2011, 2012, 2013, 2014 and 2015 (CBK, 2017). Likewise, the performance of listed firms has been declining over the study period. In 2015, the NSE had a bear run and the cumulative returns on investments fell by 20.97 percent as indicated by the performance of NSE 20 Share Index that closed at 4,040.75 points in 2015 from 5,112.65 a year before (Dyer & Blair investment bank, 2016). In the

same year the shilling hit a low of Ksh 102.31 against the dollar. According to Dyer and Blair Investment (2016) the poor performance of the listed firms can be attributed to the depreciation of the Kenyan shilling against the US dollar and other major currencies.

Balu and Armeanu (2000) suggested that exchange rates between home and foreign currency can change drastically within a short period of time, exposing unprepared firms to potentially crippling losses. Kenyan firms have made foreign currency losses due to volatility of the Kenyan shilling, for example, Kenol Kobil reported foreign exchange losses of Ksh 4.2 billion in 2012, Ksh 105 million in 2013 and 122,272 million in 2014 (Kenol Kobil Limited, 2014). The Athi River Mining Company reported foreign exchange losses of Ksh 3,717million in 2015 and Ksh 285,698 million in 2014. The Kenya Power and Lighting Company reported a net foreign exchange loss of Ksh 18 million in 2013 and Ksh 1,089 million in 2014 (Kenya Power and Lighting Company, 2014). The foreign exchange losses affect the overall profitability of firms.

Empirical research in developed countries has demonstrated that prudent management of exchange risk can reduce the negative impact of exchange risk on a firm's profitability. Despite general consensus among corporate managers and scholars that exchange risk has these pervasive effects on the profitability and ultimately the value of the firm, relatively few corporations in Kenya hedge against the exchange risk. Gachua (2011) found that the instruments of managing foreign rate exchange fluctuation risks used in developed countries are underutilized in Kenya due to costs and availability of these instruments. However, some Kenyan firms do hedge. This study therefore sought to assess the effects of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya.

1.2 Statement of the Problem

Globally, firms faced with financial risk and by extension currency risk have embraced risk management practices. This is supported by theoretical propositions that argue that hedging lowers volatility of cash flow, increasing the firm’s value and maximizing shareholders’ wealth (Klimczak, 2007). Theoretical arguments on hedging can be traced back to the Modigliani’s classical theory which states that if there are no taxes, no costs of financial distress, no information asymmetries, no transaction costs and if investors can perform the same transactions as companies, then the financial policies, including risk management of the firm are irrelevant (Modigliani & Miller, 1958). However, the shareholder wealth maximization theory postulates that a firm hedges to reduce the various

costs involved in highly volatile cash flows, hence improving financial performance (Jin & Jorion, 2006). Nevertheless, empirical studies have been trying to establish measurable contributions of hedging to financial performance and to firm value. Allayannis and Weston (2001) suggested that hedging against foreign exchange risk has a positive impact on overall profitability. Carter et al. (2006) found that the greatest benefit of hedging in the jet fuel industry was reduction in underinvestment costs, which increases profitability. Chiira (2009) found that management of foreign exchange risk is important to the operations of the Kenyan oil companies since these companies apply hedging techniques to minimize the foreign exchange exposure and not for speculation. Mang'oli (2012) established that foreign exchange risk hedging had a positive impact on the profits of airlines in Kenya, which help increase the value of the firms. On the contrary, other studies argue that managing foreign exchange risk has little or no impact on the firm's profitability. Bartram et al. (2004) found that the impact of financial derivative use on foreign exchange exposure to be insignificant. Similarly, Jin and Jorion (2006) in their study of 119 oil and gas producers in the US found no evidence that hedging has any significant positive effect on market value of these firms. Other studies that evaluated factors that influence hedging found that size, age, liquidity, leverage and geographical diversification have a significant positive impact on the effectiveness of hedging.

Kenyan firms have been exposed to foreign exchange risk due to globalization and the adoption of a floating foreign exchange rate regime by the government. During the study period, 2011 to 2016, the Kenyan shilling depreciated against the major currencies, especially the US dollar, the sterling pound and the Euro. Likewise, the performance of listed firms as measured by the NSE 20 share index's performance declined. In 2015, the performance of NSE 20 share index was poor, closing at 4,040.75 points from 5,112.65 in the previous year and the cumulative returns on investments fell by 20.97 percent (Dyer & Blair investment bank, 2016). The NSE 20 share index recorded the lowest performance of 2789.64 in January of 2017. The dismal performance can be attributed partly to exchange rate volatility.

From the foregoing theoretical, contextual and empirical accounts, the following is clear; first, there is a problem with financial performance of listed firms in Kenya due to the volatility of the Kenyan shilling against major hard currencies. Second, there is contradicting evidence about the effect of hedging on financial performance. Third, majority of these studies on hedging were done in developed countries; United States of America, Australia and Europe. The few studies done in Kenya on exchange risk hedging have not analysed the

effect of foreign exchange risk hedging techniques on the financial performance of firms in Kenya. These studies have not done an in-depth analysis of the effects of hedging techniques, firm specific factors and corporate governance on the relationship between the hedging techniques and financial performance. Therefore, to fill the gap, this study sought to assess the effect of foreign exchange risk hedging techniques, firm specific factors, and corporate governance on financial performance of listed firms in Kenya. This study sought to answer the following question: what are the effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance of firms listed on the NSE?

1.3 Objectives of the Study

The general objective of this study was to evaluate the effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance of listed companies in Kenya.

The specific objectives of this study were:

i. To determine the effect of foreign exchange risk hedging techniques on financial performance of listed firms in Kenya
ii. To establish the intervening effect of firm specific factors on the relationship between foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.
iii. To establish the moderating effect of corporate governance on the relationship between foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.
iv. To determine whether the joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance was significant.

1.4 Research Hypotheses

To investigate the topic under study, the following hypotheses were tested:

i. $H_0 1$: There is no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya.

ii. $H_0$2: There is no significant intervening effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

iii. $H_0$3: There is no significant moderating effect of corporate governance in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

iv. $H_0$4: There is no significant joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance of listed firms in Kenya.

1.5 Significance of the Study

This study contributed to the existing knowledge on foreign exchange risk hedging by Kenyan firms in several important areas. First, the study investigated the relationship between foreign exchange risk hedging techniques and financial performance, focusing on aspects like natural hedging, which were not covered in previous studies. The new insights are useful to managers in their attempt to reduce foreign exchange risk, hence increase profitability and create value for shareholders. Second, the study investigated the effect of firm specific factors on the relationship between foreign exchange risk hedging techniques and financial performance. It explored the role of firm specific factors namely; age, size, leverage, diversification, liquidity and foreign sales on the effectiveness of exchange risk hedging. This in-depth analysis is useful to the management of various firms in their assessment and evaluation of the effectiveness of risk management techniques.

The findings of this research provide useful information to policy makers in formulation, implementation and improvement of foreign exchange corporate hedging policy and regulations in Kenya. The new knowledge is useful to financial institutions that may be interested in developing and providing hedging products. Overall, the findings of this research have contributed to the wealth of knowledge on foreign exchange risk hedging techniques, which is beneficial to management, researchers, policy makers and academic scholars.

1.6 Assumptions of the Study

The following assumptions were made; first, companies listed on the Nairobi Securities Exchange transact using foreign exchange currency and are exposed to foreign exchange risk. Second, managing foreign exchange risk is considered important by Kenyan firms with

substantive international operations and that the hedging techniques have a positive impact on their financial performance. Third, the study assumed that the most commonly used techniques are financial and natural hedging; and the other methods are exogenous to this study. This assumption helped to demonstrate more clearly the interaction of financial hedging and natural hedging and enabled the researcher to assess their effect on the firm's financial performance. Fourth, hedging instruments are accessible to Kenyan firms, from both local and international financial markets. Lastly, the study assumed that Kenyan firms operate in a world with frictions such as taxes, information asymmetries, financial distress, and transaction costs, which force management to take measures to manage risks associated with these frictions.

1.7 The Scope of the Study

This study was restricted to all the 54 firms that were continuously listed on the Nairobi Securities Exchange during the study period (2011-2016). The study period was deemed appropriate for two reasons. First, during this period the Kenyan shilling recorded high volatility against the major hard currencies. The fluctuations exposed listed firms to foreign exchange risk. Therefore, the study sought to assess the effect of foreign exchange risk hedging techniques on financial performance during this period. Second, the selection of the period was guided by previous studies on foreign exchange risk hedging and financial performance: (Aabo & Brodin, 2014; Carter, Rogers & Simkins, 2006; Muller & Verschoor, 2003). The study used both primary and secondary data. Primary data was obtained using Likert scale type questionnaire and the secondary data was obtained from the audited financial reports of firms listed on the NSE over the six year period.

1.8 Limitations and Delimitations of the Study

The study contributed to the understanding of the effect of currency hedging, firm specific factors and corporate governance on financial performance. However, there were some matters and occurrences in this study that were beyond the researcher's control. First, the study focused on listed companies on the NSE, which are a subset of all business firms operating in Kenya. Listed firms may be different from privately held firms in terms of governance, ownership structures and reporting requirements. These contextual differences may hinder the generalizability of the findings to all firms operating in Kenya. Nevertheless, the results can used to understand the effects of foreign exchange risk hedging techniques on financial performance of listed firms in East African countries and other parts of the world.

Second, the researcher was unable to obtain some data such as the notional values of derivatives for all the firms. To counter this, the researcher applied data triangulation method where secondary data was analyzed in conjunction with primary data. Data triangulation ensured credibility of the research findings. In other instances, dummy variables were used. Third, the questionnaire was administered to one respondent at each firm. Using a single respondent can result in single respondent bias, whereby the respondent does not answer some questions accurately or may not be willing to give an honest response. To minimize the single respondent bias, the researcher removed from the questionnaire questions with a likelihood of social desirability.

1.9 Operational Definition of Key Terms

Board Independence: Refers the situation where the board member is not part of the management team or have any other interests that could compromise independence in decision making.

Board size: It is the total number of members of the board of directors of a firm.

Chief Executive Officer Duality: Refers to a situation where the Chief executive officer is also the chair of the board of directors.

Corporate Governance: This is the mechanisms, processes, systems and relations through which an entity is controlled and directed in-order to achieve it vision and mission. These encompass the framework of rules and regulations that the board of directors use to ensure that accountability, fairness, transparency and integrity are upheld within an organisation.

Exchange rate: This is the price of foreign currency. In this study the exchange rate was defined as the domestic (Kenya) currency price of foreign currency. Consequently, a rise in the exchange rate signifies a rise in the price of foreign currency, a relative cheapening of the domestic currency and hence a depreciation. A fall in the exchange rate signifies a drop in the price of foreign currency and a subsequent appreciation of the domestic currency.

Financial hedging: These are strategies, whereby firms use financial derivatives like forwards, futures, swaps, market hedges and options to minimize or to eliminate foreign exchange risk.

Financial performance: This refers to the extent to which financial objectives of a firm are being or have been achieved. Financial performance is measured using stock market or accounting based measures. The stock market based measures includes market return and Tobin's Q. The market based measures indicate the long-term financial performance with an emphasis on the firm's ability to generate future economic earnings. Financial performance was measured using the market based measures, Tobin's Q.

Firm maturity: Refers to the period the firm has been in existence. Firm maturity in this study referred to period the firm has been listed on NSE.

Firm Size: The size of the firm can be measured using different proxies like total assets, total sales, and amount of capital invested and market capitalization. In this study firm size was measured as the natural logarithm of total assets.

Firm Specific Factors: These are firms' aspects that can be controlled by the management, for example size, liquidity, leverage, foreign sales amongst others.

Foreign exchange risk management: This is the process of identifying risks facing the firm, assessing the risks and implementing strategies of reducing the risks to an acceptable level.

Foreign exchange risk: This is the sensitivity of changes in the domestic currency value of assets or liabilities due to changes in exchange rates. There are three types of foreign exchange risks; transaction, translation and economic exposure.

Geographical Diversification: It is the practice of spreading investments and establishing subsidiaries across different geographical regions to minimise overall risk and maximise returns.

Hard Currency: This is a currency that is relatively stable over time and that most people prefer to use in international trade. The most common hard currencies are the US dollar, the Euro and the Sterling pound.

Hedging techniques: These are measures undertaken by a business firm to manage, minimise or eliminate risk.

Hedging: This is an action whereby a firm takes a position through acquiring a cash flow, an asset or a contract that will rise or fall in value and offset the fall or rise in the value of an existing position. While hedging can protect the owner of an asset from a loss, it also eliminates any gain from an increase in the value of the asset hedged against.

Investment opportunities: It is the act of buying or trading in tangible or intangible assets with the hope that the assets will generate positive return or appreciate in value in future.

Leverage: This is the total amount of debt the firm has used to finance its assets.

Liquidity: Refers to the amount of current assets a firm has to meet its current liabilities.

Listed firms: These are firms whose stocks are registered and trade on an organised securities exchange like the Nairobi Securities Exchange.

Natural hedging: This is a strategy used to minimize exchange risk through the use of different financial and non-financial strategies whose performance tends to neutralize each other. These strategies include diversification across countries; matching costs and revenues; choice of invoice currency; netting inter-firm foreign exchange cash-flows; price adjustments; leading and lagging; and borrowing in foreign currency

Notional Value: The total amount of foreign currency derivatives such as forwards, futures, swaps, options, and other financial instruments, at the reporting date.

Ownership Structure: This provides an indicator of who owns majority of shares of a firm, whether external institutional investors or internal family ownership.

Risk: Refers to the situation where outcomes are uncertain and may lead to loss.

Soft Currency: This is a currency that is volatile and is avoided by traders in international trade.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter presents theoretical and empirical studies on foreign exchange risk hedging techniques, firm specific factors, corporate governance and financial performance, with the aim of obtaining detailed knowledge on how exchange risk hedging affects the financial performance of listed firms. Specifically, it presents the anchoring theories on hedging and financial performance. It also presents empirical studies on: exchange risk hedging techniques, firm specific factors, corporate governance and financial performance, which assisted in identifying the research gap. Lastly, it presents the summary, the knowledge gap and the conceptual framework.

2.2 Theoretical Perspective

This section provides an overview of foreign exchange risk hedging theories that guided this study. The theories highlighted herewith are: the financial economic risk management theory, the purchasing power parity; the transaction cost theory; the Fisher effect and international Fisher effect theory.

2.2.1 The Financial Economic Theory of Risk Management

The financial economic risk management theory explains the rationale for managing risks. The theory postulates that hedging leads to lower cash flow volatility hence reducing the volatility of a firm's value and ultimately maximizing shareholder's wealth (Klimczak, 2007). The theory traces its roots to the classical irrelevant theory by Modigliani and Miller (1958), which states that if there are no taxes, no costs of financial distress, no information asymmetries, no transaction costs and if investors can perform the same transactions as companies, then the financial policies of the firm, including risk management, are irrelevant. Later, there was a paradigm shift which embraced a world with frictions—with taxes, financial distress, information asymmetries and transaction costs, where managers hedge against risk to maximize shareholder's value. This lead to the development of the shareholder wealth maximization rationalization theory, which suggests that the rationale for risk management is to increase debt capacity, to lower cost of bankruptcy, to enhance the ability to secure internal financing, to reduce information asymmetries, and ultimately increase the hedging premium (Klimczak, 2007).

Over time, the shareholder wealth maximization rationalization theory has received empirical support from several studies. Judge (2006) found strong evidence connecting the decision to hedge to the expected costs of financial distress. The study found that larger firms, highly liquid firms, firms with a greater probability of financial distress, firms with exports or imports are more likely to hedge with derivatives. Jin and Jorion (2006) established that firms hedge to reduce the various costs incurred with highly volatile cash flows. Graham and Rogers (2002) found that hedging helps firms that are faced with convex tax functions to reduce the expected taxes, helps reduce the problem of under-investment, which occurs when firms have many growth opportunities, but the external financing is more expensive than internally generated funds, which make firms forgo the investment opportunities. Therefore, the theory suggests that results of hedging are beneficial to the firm, by increasing financial performance and ultimately maximizing shareholder's wealth.

This theory was relevant to this study because it proposes that hedging lowers the volatility of cash flows, thus enhancing financial performance. The theory explains the importance of currency hedging (the independent variable) on financial performance (the dependent variable). It supports the first hypothesis, which states that there is no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya.

2.2.2 The Purchasing Power Parity

The Purchasing Power Parity (PPP) theory was proposed by Gustav Cassel, a Swedish economist in 1918, after the First World War, while contributing to the international policy debate on the appropriate level for nominal exchange rates among the major industrialized countries. The PPP explains the relationship between the exchange rates and relative price of goods in different countries; it holds that the nominal exchange rate between two currencies should be equal to the ratio of aggregate price levels between the two countries, so that a unit of currency of one country will have the same purchasing power in a foreign country (Taylor & Taylor, 2004). The PPP theory posits that when the domestic price level increases or decreases relative to the foreign price, domestic currency depreciates or appreciates proportionally (Al-Zyoud, 2015). The reasoning behind is that markets are integrated and interdependent such that if there are differences in price across countries, arbitrage will take place until the price levels are equalized. It is often argued that the PPP theory will hold at

least if there is the possibility of international goods arbitrage. However this is not always the case.

Empirical debate has ensued with several scholars contributing to the development of the theory and two variants of PPP have been proposed, the absolute and the relative PPP. The absolute version of PPP states that the exchange rate between the currencies of two countries is equal to the ratio of the price levels in the two countries (Al-Zyoud, 2015). The absolute PPP assumes that goods are traded in perfect markets without transaction costs and trade barriers. On the other hand, the relative PPP postulates that the percentage of change in the exchange rate between two currencies over any time period equals the difference between the percentages of change in the price levels of goods over that same time period (Lafrance & Schembri, 2002). The relative PPP takes into consideration the market imperfections such as quotas, tariffs, and transportation costs within the two countries.

PPP theory is relevant to this study because it addresses the effect of the price of goods in determining the exchange level, which in turn can impact a firm's profitability. Determining exchange rates is a strategy used in natural hedging, which is an important aspect of this study. In addition, PPP helps scholars and policy makers understand the exchange rates behaviour since countries with fixed exchange rates need to know what the equilibrium exchange rate is likely to be while countries with variable exchange rates would like to know what level and variation in real and nominal exchange rates they should expect (Taylor & Taylor, 2004). PPP is central in determining exchange rates and it is useful in exchange rate policy-making models and foreign exchange risk management (Engel, Mark & West, 2012). This theory supports the first hypothesis, especially the natural hedging variable of currency risk management.

2.2.3 Fisher Effect and International Fisher Effect Theory

The Fisher effect theory describes the relationship between inflation rates and interest rates. The theory was proposed by Fisher (1930), who suggested that nominal interest rate could be decomposed into two components, a real inflation rate and an expected inflation rate. Fisher (1930) suggested that the relationship between the nominal interest rate and the purchasing power of money is measured by the inflation rate. The theory states that nominal interest rate in any period is equal to the sum of the real interest rate and the expected rate of inflation. An increase in inflation will result to an increase in the nominal interest rate. The theory further posits that nominal interest rates in two or more countries should be equal to the required real

rate of return to investors plus compensation for the expected amount of inflation in each of the countries.

The International Fisher Effect theory, which was an offshoot of Fisher effect theory, links the exchange rates to the nominal interest rates and explains why exchange rates change over time. (IFE) theory suggests that foreign currencies in countries with relatively high interest rates will tend to depreciate because of the high nominal interest rates reflected in the expected rate of inflation (Shalishali, 2012). IFE holds that exchange rate changes are balanced out by interest rate changes, such that interest rates in appreciating currencies tend to be low enough, and in depreciating currencies high enough, to offset expected currency gains and losses. IFE assumes that appreciation or depreciation of currency prices is proportionally related to differences in nominal interest rates. Nominal interest rates would automatically reflect differences in inflation by a purchasing power parity or no-arbitrage system. Generally, IFE is not a good predictor of short-run changes in spot exchange rates (Shalishali, 2012). This is due to the numerous short-term factors that affect exchange rates and predictions of nominal rates and inflation. In the longer-term, IFE shows that there exists a relationship between interest rate differentials and subsequent changes in spot exchange rate. This theory was deemed relevant to this study because of its focus on changes in interest rates, which in turn influences changes in exchange rates. Changes in exchange rates expose firms to exchange rate risk, which is minimised through hedging.

2.2.4 Transaction Cost Theory

The Transaction Cost Theory, otherwise known as the Transaction Economic Cost Theory, was initially proposed by Ronald Coase in 1937. It articulates the reasons why firms are involved in international business. The theory posits that firms seek to minimize the costs of exchanging resources within the environment in which they operate, while putting into consideration the bureaucratic costs of operations (Williamson, 1985). The theory considers the actual cost of outsourcing versus cost of in-house production activities, which is an important basis for companies deciding on whether to make or buy their goods locally or source from international markets. If internal costs are lower than the external transaction costs, the company will prefer sourcing from the markets offering better and lower costs. The theory suggests that decision makers constantly compare the transaction costs of sourcing from international markets against the costs of managing exchanges internally (Martins, Serra, Leite, Ferreira & Li, 2010). Internalizing the transactions, the theory argues, optimizes the relative value of the exchange and in essence, the market price mechanism is

replaced by fiat. The theory focuses on the determinants of coordination of the transactions through markets or hierarchies, and it further suggests that the boundaries of the firm should be a function of the governance structure (Martins et al., 2010).

According to Williamson (1981) a transaction cost occurs when a good or a service is transferred across a technologically separable interface. Transaction costs arise every time a product or service is being transferred from one stage to another, where new sets of technological capabilities are needed to make the product or service. The transaction costs of drafting, negotiating, and safeguarding any exchange or transaction are frictions that impede smooth transactions (Williamson, 1985). The transaction costs related to the exchange of resources with the external environment could also be reflected by factors like environmental uncertainty, opportunism, risks, bounded rationality, core company assets among others. If companies perceive the environmental uncertainty as high, they might choose not to outsource or exchange resources with the environment (Martins et al., 2010). This theory was relevant to this study because it explains the rationale behind firms opting in or out of the foreign market depending on the risks involved. The theory also suggests that corporate governance is critical in determining whether to diversify across borders. This theory supports hypothesis two, which addresses firm-specific factors, and hypothesis three, which assesses the moderating effect of corporate governance on currency hedging and financial performance.

2.3 Empirical Literature

This section presents empirical studies that provided insight into foreign exchange risk hedging techniques, firm specific factors, corporate governance and financial performance of firms. The studies assisted in identifying the knowledge gap. The section presents literature on the relationship between foreign exchange hedging techniques and financial performance; the mediating effect of firm specific factors; the moderating effect of corporate governance factors on the relationship between foreign risk management techniques and financial performance of a firm.

2.3.1 Foreign Exchange Risk Hedging Techniques and Financial Performance

Several studies have cross-examined the issue of foreign exchange risk hedging techniques (FERH) and firms' financial performance. FERH techniques are actions taken by a firm to mitigate the exchange risk. The most commonly used techniques include financial and natural hedging. Financial hedging involves the use of financial instruments like Futures, Forwards,

Swaps, Money Market Hedge and Options. Natural hedging strategies are measures used to minimize foreign exchange risk without using or engaging the services of financial institutions. These measures include geographical diversification of operation and sales, leading and lagging, matching costs and revenues, among others.

Allayannis and Weston (2001) examined the use foreign currency derivatives on a sample of 720 large U.S. non-financial firms. Using Tobin's Q for the estimate of the firm's value, the study established that the use of currency derivatives increases the value of the firm. Specifically, firms that are exposed to foreign exchange risk and use currency derivatives have a 4.87 percent higher value than firms that do not use the currency derivatives. Similarly, Bartram et al. (2004) evaluated the use of financial derivatives by firms across countries, by examining 7319 non-financial firms from 50 countries. The study revealed that the use of general derivatives has a positive effect on the value of the firm. The study also found evidence that firms located in less liquid derivatives markets, characteristically in less developed countries, are less likely to hedge.

Gleason, Kim and Mathur (2005) evaluated the relationship of the operational and financial hedging strategies of U.S. high technology firms. Using a sample of 216 firms and regression analysis, the study found that firms that use derivatives are large and spend more on research and development than non-derivative users. The study further revealed that financial hedging and operational hedging are complementary, and that financial hedging adds value to the firm while operational hedging does not. Similarly; Treanor, Carter, Rogers, and Simkins (2013) analysed the operational hedges that are often used by airlines to determine if operational and financial hedges are complements or substitutes. The study found that most airlines are likely to use financial derivatives and that the use of financial derivatives increases firm value. Surprisingly, the study found that the use of operational hedges decreases the value of the firm.

Carter et al. (2006) investigated jet fuel hedging behaviour of firms in the US airline industry during 1992-2003 to establish whether such hedging increases the value of these firms. Using Tobin’s Q as proxy for firm value, the study found that jet fuel hedging is positively related to airline firms’ value. It revealed that the greatest benefit of hedging in this industry is the reduction of underinvestment costs, since fuel prices are highly correlated to the investment opportunities in the sector. On the contrary, Jin and Jorion (2006) investigated the effect of hedging on firms’ value using 119 US oil and gas producers and found no evidence that

hedging has any significant positive effect on the market value of the firms in the oil and gas industry. However, the study concluded that hedging reduces the sensitivity of the firms' stock prices to oil and gas prices.

Mumoki (2009) assessed foreign exchange risk management strategies and techniques used by banks in Kenya to reduce foreign exchange risk exposure. The study found that the forward contract was the most frequently used instrument, whereas futures contract, foreign currency option, leading and lagging techniques and money market hedge were occasionally used by commercial banks in Kenya. The study did not assess the impact of the hedging techniques on the financial performance. Similarly, Gitogo (2012) investigated the relationship between derivatives and financial performance of commercial banks in Kenya. The study found that there is a relationship between derivatives and financial performance of commercial banks in Kenya.

Choi and Jiang (2009) examined the effects of multi-nationalism on exchange risk exposure. The study focused on the exchange risk exposure of US firms between 1983 and 2006, comparing multinational and non-multinational firms. Using a two-stage least square analysis, the study revealed that financial hedging is insignificant while the operational hedging is significant in reducing exchange risk exposure. Further, the study indicated that operational hedging decreases a firm's exchange risk exposure and increases its stock returns.

Mwangi (2013) investigated the effect of foreign exchange risk management on financial performance of Microfinance Institutions (MFIs) in Kenya, using a census study of all the 44 registered MFIs. The results established that a strong positive relationship exists between ROA and forward contracts; and between ROA and options. This implied that MFIs who used forward contracts and options to manage foreign exchange risk had registered improved financial performance. Similarly, Njunge (2012) examined the foreign exchange rate risk management practices adopted by MFI's in Kenya. The study concluded that the various foreign exchange risk management practices adopted by micro finance institutions in Kenya included; price adjustment, forward contracts, swaps, netting and price negotiation, delay of payments when foreign currency was strong, and accelerated payments when foreign currency was weak. Both studies did not assess the effect of the currency hedging on financial performance.

Runo (2013) examined the influence of foreign exchange risk management on the profits of oil companies listed on NSE, KenolKobil and Total Kenya Limited, from 2002 to 2012. Using regression analysis, the study found that foreign exchange risk affects the profitability of the firms. Similarly, Chiira (2009) did a survey on foreign exchange risk management practices by oil companies. Using a target population of 27 major oil companies operating in Kenya, the study found that exchange risk exposure is the second most significant risk to oil companies after fluctuation in global crude oil prices. Further, the study found that all the companies practice internal hedging techniques while only 35 percent of the companies used external hedging techniques. The study found that the most commonly used internal hedging technique is the choice of the currency of billing while forward contracts was the most frequently used financial derivative.

Nasurutia (2013) examined the effectiveness of derivatives in managing foreign exchange exposure among commercial banks in Kenya. The study focused on all the 10 listed commercial banks that were in operation during the period between 2008 and 2012. Using regression analysis, the study results indicated that derivative usage has a negative relationship to foreign exchange exposure, implying that an increase in derivative usage results in a corresponding decrease in foreign exchange exposure. This suggests that foreign exchange risk hedging minimized foreign exchange risk, hence increased the profitability of the commercial banks.

Dong, Kouvelis and Su (2014) investigated the impact of operational flexibility on firms' economic exposure to currency fluctuations in the presence of global competition. The study focused on two operational strategies; matching currency foot prints, which is a natural hedge, and capacity pooling strategy. Using a two-stage stochastic model, the study concluded that operational hedging techniques increase profits and reasonably reduce the foreign exchange risk. Likewise, Ahmed, Azevedo and Guney (2014) examined the effect of with financial derivatives on firm value and financial performance of nonfinancial firms listed in the FTSE-All share index at the London Stock Exchange (LSE). The study covered the time period between 2005 and 2012. The study found positive and significant relationship between the overall foreign exchange risks hedging, with firm value and financial performance. The study also found that the effectiveness of hedging depends on the type of financial risk been hedged.

Hoberg and Moon (2014) sought to explain why many firms that are globally active do not actively hedge despite the availability of alternatives that are cheaper than financial derivative. The study had proposed that incomplete hedging markets discourage hedging and suggested that operational hedging is often a more effective hedge. The study found that firm do not engage in hedging due to incomplete and underdeveloped derivative markets. The study also found that the probability of using financial hedging increases when the efficacy of currency derivatives as a hedge against consumption risk is higher. On the other hand, firms are less likely to practise financial hedging, and are more likely to use operational hedging when the efficacy of financial hedging is poor.

Ito et al. (2015) investigated the relationship between Japanese firms' exposure to the exchange rate risk and risk management tools, using a questionnaire survey covering all Tokyo Stock Exchange listed firms in 2009. The study used Tokyo Stock Price Index (TOPIX) and MSCI Japan Index as proxy for market portfolios and found that firms with high foreign sales are exposed to higher foreign exchange risk and that most of these Japanese firms use a combination of multiple risk hedging tools to reduce foreign exchange rate risk. The study concluded that the most commonly used techniques include; choice of invoicing currency, exchange rate pass-through, financial and operational hedges. Similarly, Kuzmina and Kuznetsova (2017) assessed the operational and financial hedging of German public firms between 2011 and 2014 that are involved in import and export businesses. The study found that firms use operational hedging as a substitute of financial derivatives when there is high exchange-rate fluctuations and when foreign denominated receipts match costs. The study found that there is a low correlation between foreign exchange risk and the value of the firm, implying that in the presence of endogenous hedging, both financial and operational, firms can find alternative ways of dealing with exchange risk.

Parlak and İlhan (2016) investigated the effect of foreign exchange open positions of manufacturing and service sector companies on financial performance in Turkey. The study used a sample of 30 firms for the period between 2012 and 2015. Using the ANOVA test, the study revealed that companies with short foreign exchange positions were able to increase their overall profitability almost to the same level as companies with long foreign exchange positions when the local currency was overvalued. However, these firms were exposed to serious losses when the local currency was devalued. Further, using regression analysis, the study showed that companies with a short foreign exchange position in the present period had

higher liquidity, asset efficiency and lower overall profitability than companies with a long foreign exchange position in the previous period.

Altuntas, Liebenberg, Watson and Yildiz (2017) explored the relationship between hedging, cash flows, and firm value. Specifically, this study assessed the impact of derivatives hedging on firm value both directly and indirectly through its effect on cash flow volatility. The study found that both derivatives hedging and cash flow volatility are negatively related to firm value, implying that increase in hedging results to a decrease in cash flow volatility. Overall, the study found that derivatives usage alone decreases firm value and performance for life insurers; however, when the study evaluated the effectiveness of hedging on cash flow volatility, the study found that the firms' value of the hedgers was less sensitive to cash flow volatility compared to the value of non-hedgers.

Nzioka and Maseki (2017) evaluated the effects of hedging foreign exchange risk on financial performance of non-banking companies and found that hedging techniques positively affect a firm's financial performance. The study also found that internal hedging techniques are more preferred than the external hedging techniques in Kenya. According to the study, this can be attributed to the complexities associated with external techniques. Correspondingly, Chanzu and Gekara (2014) found that non-financial and financial firms in Kenya do not hedge using financial derivatives because their management teams believe that exposure to risks is effectively managed through other means like natural hedging. The study further established that the minimal use of derivatives is due to the political environment, limited knowledge of derivatives, participants' attitude, financial infrastructure, and foreign competition. The minimal use of financial derivatives can also be attributed to the fact that the derivative market and instruments are not fully developed in Kenya.

Sikarwar (2018) investigated the relationship of exchange rate exposure and currency derivatives usage before, during and after the global financial crisis of 2008. The study used a sample of 624 Indian firms over the period of April 2001 to March 2016. The study did not find any evidence that the usage of currency derivatives is more effective in reducing exposure during the crisis and post-crisis period compared to the pre-crisis period. The study concluded that the effectiveness of derivatives usage in reducing exposure becomes less during the dynamic environment of crisis.

Opie and Riddiough (2019) assessed the effect of hedging foreign exchange risk in the international portfolios made up of equity and bonds. The study applied time-series to predict equity's and bond's returns. The study's findings indicated that the currency hedging strategies outperformed other leading alternative hedging strategies in generating risk-adjusted returns, ultimately increasing the firm's value and shareholder's returns. The findings also indicated that currency hedging yield superior diversifications gains to global equity and bond investors. These findings imply that, as the value of international businesses and investments raises, currency hedging is critical in managing foreign exchange risk of global portfolios to increase the returns.

In conclusion, the studies reviewed above provide contradictory evidence on the effect of currency hedging techniques on financial performance. Majority of these studies suggest that financial hedging increases the value of the firm, while others found no relationship between financial hedging and firm's financial performance. Other studies found that natural hedging has no effect on financial performance. The review also revealed that majority of the studies were undertaken in developed countries. This study aimed at bridging this knowledge gap. The study proposed that there is a significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya.

2.3.2 Foreign Exchange Risk Hedging Techniques, Firm Specific Factors and Financial Performance

Foreign exchange risk hedging and financial performance can be influenced by: firm's size, age, liquidity, geographical diversification, leverage, investment growth and foreign sales among other. Solakoglu (2005) examined the relationship between exchange rate exposure and firm-specific factors of Turkish firms. Using the panel data approach, the study covered the period between 2001 and 2003. The results indicated that the size of the firm and the level of international activity have significant effect in minimising foreign exchange risk. Large firms have the knowledge and resources, which enable them to engage in hedging, which assist in lowering foreign exchange risk. In addition, the firms that can be grouped as net-exporters or net-importers are more likely to experience high levels of foreign exchange risk, hence they are more likely to hedge.

Muller and Verschoor (2008) examined the determinants of corporate foreign currency derivatives (FCDs) usage and their role in reducing foreign exchange risk exposure for European non-financial firms in four countries: U.K., Germany, the Netherlands and

Belgium. The study revealed that firms in the four countries use FCDs to hedge and not to speculate. The study also found strong evidence in favour of the existence of economies of scale in hedging and that European firms engage in hedging programs in response to tax convexity, implying that size and taxes influence foreign exchange risk hedging techniques.

Al-Momani and Gharaibeh (2008) analysed the foreign exchange risk management practices of Jordanian firms, with special focus on the relationship between various factors affecting the adoption of foreign exchange risk hedging techniques, namely firm size, sector, international business involvement, and legal structure. The study used the Kruskal–Wallis one-way analysis of variances. The results indicated that there is no relationship between firm size, legal structure and the risk management practices aimed at minimizing transaction exposure. However, the study found a relationship between a firm's sector and international involvement with the foreign risk management practices used to reduce the transaction exposure. With regard to the economic exposure, the study did find a relationship between all the factors; firm size, sector, international business involvement, and legal structure influenced the foreign risk hedging techniques.

Omondi and Muturi (2013) assessed the factors affecting the financial performance of listed companies at the NSE. The study found that high level of leverage has a significant negative effect on financial performance, that is, as the firm increases debt beyond the optimum level, financial performance declines and the risk of bankruptcy increases. The study concluded that size is an important determinant of financial performance of the firm. Similarly, Serrasqueiro and Nunes (2008) investigated the relationship between firm size and performance of small and medium sized Portuguese companies for the period 1999 to 2003. The study found a positive and statistically significant relationship between size and profitability of SMEs. The conclusions of various studies on the impacts of size on profitability can be negative or positive (Serrasqueiro & Nunes, 2008).

Agyei-Ampomah, Mazouz and Yin (2013) studied the sensitivity of foreign exchange exposure and its determinants using a sample of 269 UK non-financial firms. The results of the study indicated that the determinants of foreign exchange exposure are model-dependent. The cross-sectional analysis revealed that specific-firm factors, such size, leverage, growth opportunities and liquidity had very little or no impact on a firm's exposure to foreign exchange risk, while using pooled panel data model across firms and time increases the effect of firm specific factors on the exposure.

Aktas, Cousin and Zhang (2013) assessed the effect of operational hedging, specifically geographical diversification, on the value of the firm. Using a sample of large French firms from the SBF 250 index for the period from January 1999 to December 2010, the study focused on the cross border takeovers as a strategy of minimising currency risk. The difference-in-differences (DD) research design proposed by Roberts and Whited (2013) which combines cross-sectional and time-series differences was used. The study findings revealed that operational strategies used by acquirers with high foreign currency risk exposure helped stabilised the market values of the target firms. The study also found that operational hedging increase the value of net importer. The implications of these findings is that geographical diversification do influence the effectiveness of hedging strategies.

Chaudhry, Mehmood and Mehmood (2014) examined the determinants of corporate hedging policies and derivative usage in risk management in Pakistan. The study used data from 75 non-financial firms listed in Karachi Stock Exchange for the period between 2007 and 2011. Mann-Whitney U test was used to differentiate between the derivative user and non-user. The study found a significant relationship between the use of derivatives and foreign purchases, liquidity, firm growth and size. Further, the study established that derivative users have a competitive edge over the non-users because of proper risk management practices, economies of scale and as a result of using different kinds of derivative instruments.

Giraldo-Prietoa, Uribeb, Bermejoc and Herrera (2017) explored the effect of financial hedging on the value of listed firms in Colombia. The study also assessed the effect of firm specific factor; size, debt or leverage, investment growth, international exposure to foreign markets, profitability, and geographical diversification, on value generation of firms. The study established the following. First, the use of financial derivatives has a positive relationship with the market value of the firms. Second, leverage, market capitalization, and net profitability have a positive influence on the value generation of firms. Lastly, the study found that geographical diversification, had positive relationship with the market value of the firms.

Geyer-Klingeberg, Hang and Rathgeber (2018) assessed the factors that drive the disparities in the results of studies on whether hedging improves firm's value and financial performance. The study collected data from 75 published studies. These empirical studies revealed diverse results about the level of hedging premiums obtained from hedging practices. The disparities, according to the study, are due to country level conditions, firm specific factors, micro and

macroeconomic factors. The study also found that the disparities could be due to several aspects of data used, method of analysis and model misspecification. The study also revealed that the value impact of hedging are smaller in countries with high stock trading volume, lower taxes and OECD countries. The study concluded that apart from the common firm specific factors, country specific factors can influence the hedging premium generated by risk management practices.

Ruhomaun, Saeedi and Nagavhi (2019) examined the effect of selected macro and micro economic variables on firm performance for listed firms, categorised as industrial products sector in Malaysia. The study used a sample of 196 companies over a time period of five years between 2012 and 2016 and the data was analysed using the dynamic panel data model. The study revealed that exchange rate had a negative but insignificant impact on firm performance. On the other hand, the study found that interest rate and financial distress have a negative but significant effect on firm performance, implying, that when firms use high levels of debt, the financial performance deteriorates because the costs associated with financial distress. Lastly, the study found that derivatives usage and had a positive significant effect on firm performance, that is, an increase in derivative usage, results to improved financial performance.

Going by the studies reviewed in this section, it is clear that some firm specific factors like size, leverage, liquidity, foreign sales, geographical diversification, tax levels, foreign purchases, amongst others, influence hedging decisions and financial performance. This study selected the commonly identified firm specific factors, guided by previous like (Chaudhry et al., 2014; Agyei-Ampomah et al., 2013; & Solakoglu, 2005). This study therefore had the hypothesis that firm specific factors have a mediating effect on the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

2.3.3 Foreign Exchange Risk Hedging Techniques, Corporate Governance and Financial Performance

The strength of the corporate governance of a firm may affect the hedging techniques adopted by organisations. Allayannis, Lel and Miller (2012) investigated the impact of corporate governance and hedging premium around the world for a period of ten years. The study found that hedging has a positive impact on the firm's value and corporate governance is an important factor in assessing the effectiveness of hedging policies and practices. The study

established that hedging premium is statistically significant and economically large for firms with strong internal corporate governance and that hedging premium is insignificant for firms with weak internal governance. The findings suggested that hedging is not valuable when internal corporate governance is weak and that corporate governance plays a significant role in understanding when risk management can be linked with higher firm value.

Lel (2012) examined the impact of corporate governance on the use of currency derivatives by firms in 30 countries between 1990 and 1999. The study concluded that the strength of the corporate governance influences how firms hedge foreign exchange risk. The results indicated that strongly governed firms are likely to use derivatives to hedge against currency exposure and overcome costly external financing, while weakly governed firms use derivatives for managerial reasons and use selective hedging. Similarly, Allayannis et al. (2012) examined the relationship between the use of foreign currency derivatives, corporate governance and firm's value. Using a sample of firms from thirty-nine countries with significant foreign exchange risk exposure, the study found strong evidence that the use of currency derivatives by firms that have strong corporate governance generated a significant hedging premium.

Osuoha et al. (2015) investigated the impact of corporate governance on derivatives usage in African non-financial firms. Using a sample of 760 firms from 17 African countries, the study revealed that that board composition had a strong impact on derivatives usage, and that derivative usage increased with increase in the number of executive directors in the board. The study concluded that firms with strong corporate governance reduced the misuse of derivatives that could negatively impact the firm's value. Similarly, Ahmed, Azevedo and Guney (2015) examined the relationship between underinvestment problems and corporate governance strength on corporate hedging decisions. Using 265 non-financial firms listed on FTSE-All share index for the period from 2005 to 2012, the regression analysis revealed that, corporate governance has a strong influence on the hedging decisions implemented to manage financial risk exposure.

Husaini and Saiful (2017) assessed the influence of corporate governance, enterprise risk management on the value of the firm. The study used a sample of 110 Indonesian publicly listed firms, for the period between 2010 and 2013. Using multiple regression analysis the study found that the implementation of risk management strategies has a positive impact on the value of the firm. Further the study revealed that the size of the board of director has a

positive influence on the performance since the larger the number of directors, the more effective supervision of the management by the board, which results to increased financial performance. The study also found that a higher proportion of independent board members, the higher the quality of decisions made, devoid of conflict of interest, therefore increasing the value of the firm. Lastly the study revealed that high percentage of insider ownership, especially managerial ownership, has a negative impact of the value of the firm.

Saseela (2018) examined the impact of corporate governance on firm's performance of Sri Lankan listed companies, between 2010 and 2015. Using secondary data from the firm's annual reports, corporate governance was measured using board size, board independence, CEO duality, director's ownership and audit committee. The study operationalised financial performance using ROA and Tobin's Q. Multiple regression was used to analyse the data, the study found that the board size had a significant effect on Tobin's Q and the audit committee had a significant impact on ROA. However, the study found that CEO duality and director's ownership had an insignificant impact on financial performance. Further the study established that small board size results to higher financial performance.

Hegea, Hutson and Laing (2018) assessed the impact of mandatory governance changes, imposed by the government, on financial risk management and financial performance. The study focused on the introduction and adoption of the Sarbanes-Oxley Act of 2002 which mandated firms to strengthen corporate governance structures. Using a sample of 507 US listed firms the period between 2000 and 2007, the study found that improvements in corporate governance lead to less foreign exchange exposure and lead to an increase in the use of foreign exchange derivatives for hedging purposes. The study using the Dynamic panel GMM estimates, concluded that there is a positive relationship between the quality of corporate governance and hedging practices. The higher the quality of corporate governance, the more effective and efficient use of derivatives for hedging purposes. The study concluded that firms tend to hedge too little of the exchange risk if managerial discretion is not controlled by good corporate governance mechanisms.

Butt, Nazir, Arshad and Shahzad (2018) sought to assess the role of ownership concentration in risk management using derivative instruments. The study used a sample of 101 non-financial firms listed on the Pakistan Stock Exchange (PSX) for the period between 2010 and 2016. The study did a comparison of derivative users and non-users using the Mann-Whitney test, together with logistic regression to check the effect of ownership concentration

on derivative usage. The ownership concentration referred to the top five shareholdings, the ratio of family ownership with highest control, managerial ownership and the associated companies. Ownership is a critical component of corporate governance. The study revealed that concentrated owners were less likely to use derivatives for hedging purposes due to concentrated owners' vested interests.

From the foregoing studies, it is evident that corporate governance influences risk management practice, the choice of hedging techniques, and consequently financial performance. Therefore, this study hypothesized that corporate governance has a moderating effect on the relationship between foreign exchange hedging techniques and financial performance of listed firms in Kenya.

2.4 Summary and Knowledge Gap

The following can be deduced from the foregoing literature review. First, most studies on the effect of currency hedging on a firm's performance give conflicting results. Some provide evidence that hedging foreign exchange risk improves the financial performance, while others suggest that hedging has no effect on financial performance. Second, past studies indicate that the relationship between hedging and financial performance is influenced by a firm's specific factors like size, age, leverage, and diversification amongst others. Other studies suggest that the effect of firm specific factors can be reduced or strengthened by the models used in the study. Third, some studies provide evidence that the strength of corporate governance has a positive effect on hedging, while other studies did not find supporting evidence.

The purpose of this study was to fill these research gaps. This was achieved through assessing the effect of foreign exchange risk hedging techniques on financial performance and establishing the intervening effect of firm specific factors on the relationship between exchange hedging techniques and financial performance. The gaps were also filled through determining the moderating effect of corporate governance on the relationship between hedging techniques and financial performance. Finally, the research gaps were addressed by analysing the joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance of a firm. The study expected to find that foreign exchange risk hedging techniques help minimize volatility of expected cash flows, improve profitability and improve the overall financial performance of listed firms. Table 2.1 below summarises the research studies reviewed, which assisted in identifying the research gap.

Table 2.1
Summary of Empirical Literature and Knowledge Gaps

2.1.1 Foreign Exchange risk Hedging Techniques and Financial Performance

Researcher (s)	Focus of Study	Study Model/ Variables	Findings	Research Gaps	Gaps addressed in this study
Ito et al. (2015)	Investigated relationship between Japanese firms' exposure to the exchange rate risk and risk management tools	Regression model modified from Bodnar and Wang (2003) model	Found that firms which heavily depend on sales in foreign markets have greater foreign exchange risk and that most of these Japanese firms use a combination of multiple risk management tools to reduce foreign exchange rate	The study focused on the Japanese exporting firms. It did not focus on importing firms.	The study focused on all listed firms, both importing and exporting.
Nasurutia (2013)	The effectiveness of derivatives in managing foreign exchange exposure among commercial banks in Kenya.	Regression analysis	Found a negative relationship with foreign exchange exposure and derivative use, implying that an increase in derivative usage results in a corresponding decrease in	The study did not assess the effect of derivative usage on financial performance.	The study analyzed the effect of derivative usage on performance.

			foreign exchange exposure.		
Chiira (2009)	Survey of foreign exchange risk management practices by oil companies in Kenya.	Regression analysis	Found that all the companies practice internal hedging techniques while only 35% of the companies used external hedging techniques (derivatives).	The study did not analyze the effect of hedging techniques of the financial performance.	The study analyzed the effect of financial hedging on performance.
Mumoki (2009)	Assessment of foreign exchange risk management strategies and techniques used by banks in Kenya to manage foreign exchange risk exposure	Regression analysis	Found that the forward contract was the most frequently used instrument, whereas futures contract, foreign currency option, leading and lagging techniques, money market hedge are occasionally used by commercial banks in Kenya.	The study did not assess the effect of derivative usage on financial performance	The study analyzed the effect of derivative usage on performance.
Carter et al. (2006)	Investigated jet fuel hedging behavior of firms in the US	Regression analysis	Found that jet fuel hedging is positively related to	The scope of the study was US	The study analyzed the effect of hedging on

	airline industry.		airline firm’s value	airline firms	financial performance of firms in different industries.
Bartram et al. (2004)	Evaluated the use of financial derivative by firms across countries.	Regression analysis	Found use of general derivatives has a positive effect on the value of the firm.	The study focused on the general use of derivatives.	The study analyzed the use of financial and natural hedging for hedging purposes.
Dong et al. (2014)	Investigated the impact of operational flexibility on firms' economic exposure to currency fluctuations in the presence of global competition.	Two-stage stochastic model	There was profit maximizing performance and reasonable downside exchange risk control with the use of the operational hedging techniques.	The study focused on two operational strategies	The study focused on several operational and financial hedging strategies.
Choi and Jiang (2009)	The relationship between multinationalism of a firm and its effect on exchange risk exposure	Two-stage least square (2SLS)	The study revealed that financial hedging is insignificant while operational hedging is significant in reducing exchange risk exposure. There is evidence that	The scope of the study was US firms	The study focused on firms in a developing country.

			operational hedging decreases a firm's exchange risk exposure and increases its stock returns.		
Gleason, Kim and Mathur, (2005)	Evaluated the operational hedging strategies of U.S. high technology firms and how operational hedging is related to financial hedging.	Regression analysis	The study found that firm that use derivatives are large and are more R&D intensive than non-derivative users. Further the study revealed that financial hedging and operational hedging are complementary. The results also showed that financial hedging adds value to the firm while operational hedging does not.	The scope of the study was high technology firms in the US.	The study focused on firms in different industries.

2.1.2 Foreign Exchange Risk Hedging Techniques, Firm Specific Factors and Financial Performance

Researcher (s)	**Focus of Study**	**Study Model/ Variables**	**Findings**	**Research Gaps**	**Gaps addressed in this study**
Muller and Verschoor (2008)	Examined the determinants of corporate FCDs usage and their role in reducing foreign exchange risk exposure for European non-financial firm.	Correlation and Regression analysis	The main determinants of FCDs use and disclosure are firm's foreign trading volumes, size and tax convexity.	The study's focus was on factors determining FCDs use in developed countries	The study focused on the factors determining FCDs use in developing countries.
Al-Momani, and Gharaibeh, (2008)	Analyzed the foreign exchange risk management practices of Jordanian firms, with special focus on the relationship between various factors affect the adoption of foreign exchange risk management techniques.	The Kruskal–Wallis one-way analysis of variances	The study found a relationship between a firm's sector and international involvement with the foreign risk management practices used to reduce the transaction exposure. With regard to the economic exposure, the study did found a relationship between all the factors; firm size, sector,	The study's focus was on factors determining FCDs use in developed countries.	The study focused on the factors determining FCDs use in developing countries.

			international business involvement, and legal structure influenced the foreign risk managerial techniques used.		
Solakoglu (2005)	Examined the relationship between exchange rate exposure and firm-specific factors of Turkish firms.	Regression using panel data approach	The results indicated that the size of the firm and the level of international activity are significant in lowering the exposure.	The study focused on factors in developing country in Asia	The study focused on the factors determining FCDs use in developing countries, in Africa.

2.1.3 Foreign Exchange Risk Hedging Techniques, Corporate Governance and Financial Performance

Researcher (s)	Focus of Study	Study Model/ Variables	Findings	Research Gaps	Gaps addressed in this study
Allayannis, Lel and Miller (2004)	Investigated the impact of corporate governance and hedging premium around	Standard robust estimator of variance	The study found that hedging have a positive impact on the firm's value and corporate governance is an important factor in assessing the value of hedging policies.	The study focused on the role of corporate governance and firms value around the world	The study explored the influence of corporate governance on the relationship between hedging techniques and financial performance.
Lel (2011)	Examined the impact of corporate governance on the use of currency derivatives	Correlation and Regression analysis	The results showed that strongly governed firms are likely to use derivatives to hedge currency exposure and overcome costly external financing	The study focused on the influence of corporate governance and use of derivative in cross-country setting.	The study focused on the influence of corporate governance on the relationship between hedging techniques and financial

					performance.
Osuoha, Martin and Osuoha (2015)	Investigated the impact of corporate governance on derivatives usage of African non-financial firms	logistic regression	The study concluded that firms with strong corporate governance reduce the misuse of derivatives that could negatively impact the firm's value.	The study focused on the impact of corporate governance on currency derivative.	The study explored the influence of corporate governance on the usage of both financial hedging and natural hedging
Ahmed, Azevedo and Guney (2015	Examined whether underinvestment problems and the influence of corporate governance strength are related to corporate hedging decisions for financial	Probit regressions	The study reveals a strong influence of corporate governance on hedging decisions	Focused on the relationship between underinvestment problems, corporate governance and corporate hedging	The study explored the influence of corporate governance on the usage of both financial hedging and natural hedging

2.5 Conceptual Framework

This study sought to assess the effect of currency hedging techniques, firm specific factors and corporate governance on financial performance. The interrelationships between independent, mediating, moderating and dependent variables are illustrated diagrammatically by a conceptual framework. The Figure 2.1 below presents financial performance as the dependent variable, foreign exchange risk hedging techniques as the independent variable. The firm specific factors are shown as the mediating variables, while corporate governance is presented as the moderating variable.

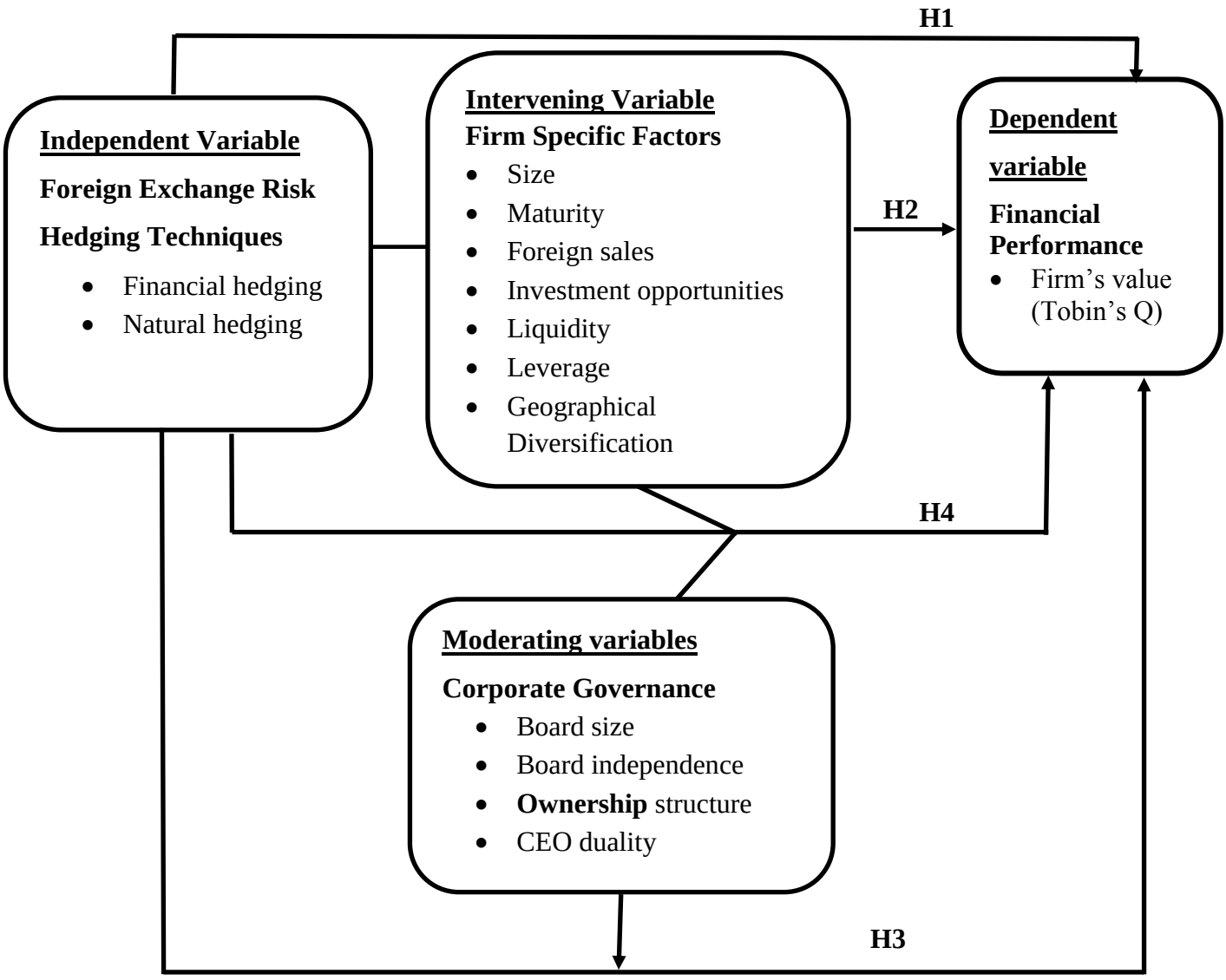

Figure 2.1: Relationship between Foreign Exchange Risk Hedging Techniques, Firm Specific Factors, Corporate Governance and Financial Performance

The model proposed a positive relationship between foreign exchange risk hedging techniques and financial performance, supported by previous studies on hedging and firm's value. Allayannis and Weston (2001) suggested that the value of firms that are exposed to foreign exchange risk increases when currency derivatives are used. Likewise, Bartram et al. (2004) suggested that the use of hedging techniques, specifically financial derivatives, has a positive effect on the value of the firm, as hedging reduces volatility of expected cash flows and reduces underinvestment costs hence increasing financial performance of a firm.

The model also suggested that firm-specific factors-size, age, investment opportunities, liquidity, leverage, foreign sales and geographical diversification-mediate the relationship between foreign exchange risk hedging and financial performance. The study expected to find a positive relationship between firm size and foreign sales on financial performance. Large firms are likely to have high foreign exchange risk exposure, and hence are likely to hedge, lowering this risk (Solakoglu, 2005). Similarly, Muller and Verschoor (2008) found that size and taxes strongly influences the foreign exchange risk hedging techniques of a firm.

The conceptual model also suggested that corporate governance moderates the relationship between foreign exchange hedging techniques and financial performance. The study expected to find a positive relationship between strongly governed firms and hedging techniques. The strength of corporate governance can influence the hedging technique adopted by a firm. Lel (2012) concluded that strongly governed firms are likely to use financial derivatives to overcome costly external financing. Firms with strong corporate governance reduce the misuse of derivatives that could negatively impact the firm's value (Ahmed et al., 2015).

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used to select, collect, organize and analyze the data to address the research problem identified. Specifically, it presents the research philosophy guiding this study, the research design, the population, the sampling procedure and the data collection methods used. Lastly it presents the statistical methods used to summarize and analyse the data.

3.2 Research Philosophy

Research philosophy is a belief about the way in which the research will be conducted and data analysed. The purpose of all research is to generate new knowledge. Such knowledge, and how it is subsequently used, will ultimately depend on the philosophy guiding the research, for different kinds of research philosophies produce particular kinds of knowledge that are often not compatible. According to Sobh and Perry (2006), research philosophy is important because it helps the researcher in the choice of research design, data collection, analysis and subsequent interpretation of results. Research philosophies are grouped into positivism, interpretivism and realism depending on the philosophical thinking of the researcher, broad disciplinary categories and research conventions in those disciplines. A researcher's philosophical thinking is dependent on the state of knowledge, theory development stage in a particular field and the researcher's view of the world (Elly, 2014).

The dominant research philosophies in social science are phenomenology and positivism. The phenomenological position is based on the notion that the external world is influenced by the internal world. Lived but subjectively rational personal experience is considered to be epistemologically and doxologically important (Easterby-Smith, Thorpe & Lowe, 2002). The positivist position, on the other hand, posits that the external world contains clues to its own condition and that internal factors do not play a vital part in the existence and explanation of the external world. In other words, positivism aspires at objectivity while phenomenology glorifies subjectivity. Of the two research philosophies, positivism is more driven by the scientific method of verification of scientific phenomena. Positivism is more about observing, counting, measuring and verifying concepts that are largely incompatible with phenomenology, which is concerned with experiential intensity and depth.

As a research project within the social science discipline of business administration, this study, in keeping with the traditions and conventions of the discipline, adopted a positivistic approach. This is because; first, the study of business lends itself to a scientific (positivistic) approach, requiring measurement and verification. Second the positivism philosophy was adopted because the study variables were measured and verified using scientific methods. The study was also based on existing theoretical knowledge lenses, formulated using decidedly positivistic approaches, and the researcher was not part of what was being observed. At the same time, the study focused on facts, evaluated causality between variables and formulated and tested hypotheses using quantitative techniques. In consideration of all these therefore, positivism was the natural alignment for this study.

3.3 Research Design

Research design is the blueprint for the collection, measurement, analysis of data which assist the researcher in obtaining answers to research questions (Coopers and Schindler, 2001). Research designs are classified based on different perspectives; the purpose of the study (descriptive or causal), method of data collection (survey or experiment) and time horizon (longitudinal or cross-sectional). Zikmund (2000) states that the choice of the research design is dependent on the objective of the study, the urgency of the decision, the availability, and cost of obtaining data.

This study used both cross sectional and longitudinal research designs, organized as panel data. These designs assisted in analysing the changes in the relationship across firms and in the variables over time. This design was deemed appropriate because the purpose of the study was to assess the effect of currency hedging techniques on the financial performance over a period of six years. The design helped to generate the evidence necessary for making causal inferences about relationships between foreign exchange risk hedging techniques, firm specific factors, corporate governance and financial performance. Longitudinal design assisted in analysing the changes in the relationships and in the variables over time.

3.4 Population of the Study

Data was collected and analysed at the firm level. The target population was all the 54 firms that were continuously listed on NSE during the study period, 2011 to 2016. The selection of the period was guided by previous studies on foreign exchange risk management and financial performance: (Aabo & Brodin, 2014; Muller & Verschoor, 2008; Carter et al., 2006). Because the study sought to find out what has already happened, not what is currently

happening, it was necessary for the study to adopt a historical approach considering that temporal distance allows for the study of a phenomena with dispassion and is therefore consistent with the positivist philosophy guiding this research. Firms listed in NSE are grouped under the following classifications: agriculture; automobiles and accessories; commercial and services; construction and allied; energy and petroleum; insurance; investment; investment services; manufacturing and allied; telecommunication and technology; and growth enterprise market segment (Appendix V).

The listed firms were deemed to be appropriate for this study due to various reasons. First, there is diversity and representation of all sectors of the economy. Second, listed firms comply with the statutory requirements outlined by the Capital Markets Authority (CMA), making the financial data reported to be reliable. Lastly, these firms use the International Financial Reporting Standards (IFRS) in preparing the financial statements, which means there is consistency in reporting that makes it possible to make comparisons within and across firms. This study used a census approach.

3.5 Data Collection

This study used both primary and secondary data. Secondary data was extracted from listed firms' audited financial statements, which were obtained from Capital Markets Authority and Nairobi Securities Exchange data banks. The Panel secondary data for the period between 2011 and 2016 was collected with the aid of a data capture sheet (Appendix II).

Primary data was collected using a survey questionnaire (Appendix 1) containing structured, closed-ended, Likert-type scale questions. Closed-ended questions helps respondents make quick decisions when choosing among the set of alternatives and make it easier to code the information during data analysis phase (Sekaran, 2003). The use of a questionnaire, in addition to secondary data, was necessary because information on firms' exposures and foreign risk hedging techniques was not easily available in Kenya. The questionnaire had five sections. Section I contained questions on the profile of the organization. Section II and III contained questions on hedging techniques. Section IV contained questions on firm specific factors and section V had questions on corporate governance. Before embarking on the actual data collection, a pilot study was done to ensure reliability and validity of the research instrument. The pilot-test was done on six listed firms, which were not included in the study because they had been listed for less than six years. (See appendix VI). The pre-test respondents were requested to comment on the clarity of the questions in the questionnaire.

Conducting research in a sound ethical manner is a critical fundamental principle of scientific inquiry (Kjellström, Ross, & Fridlund, 2010). Several ethical practices were considered while conducting this research. First, permission was sought from the Office of the Director, Graduate School of Egerton University to proceed to the field to collect data. (Appendix VII). Second, research authorization and permit were obtained from the National Commission for Science, Technology and Innovation (NACOSTI) to undertake the research in all counties in Kenya, Appendix VIII and IX. Third, verbal consent was sought from participants before the questionnaire was delivered. The researcher sought appointments at a time convenient to the respondents. Then the researcher or research assistant personally delivered the questionnaires to the Chief Finance Officers or the Chief Risk Officers of the firms under study. The researcher explained to the respondents; the purpose of research, the value of the research, the extent of privacy and confidentiality and guaranteed that the data was to be used for academic purposes only. Lastly, the data collection process was meticulously planned and executed to ensure cooperation and increased response rate. According to Creswell (2005) the researcher should deliberately consider the ethical issues, such as maintaining confidentiality, seeking consent and protecting the identity of the respondent. All these ethical issues were considered in this study.

3.6 Operationalization of the Study Variables

The study concepts were operationalized to make them measurable, which assisted in the analysis and eventually arriving to meaningful conclusions. The study variables were operationalized, borrowing from previous studies. Foreign exchange risk hedging techniques were decomposed into financial hedging and natural hedging. Financial hedging was measured using dummy variables, where the value of 1 was assigned if the firm reported the use of financial derivatives for hedging purpose and 0 if otherwise, borrowing from previous studies (Marsden & Prevost, 2005; Bartram, Brown & Conrad, 2011). Similarly, natural hedging was measured using dummy variables, where the value of 1 was assigned if the firm reported the use of natural hedging for hedging purposes and 0 if otherwise. Judge (2006) used dummy variables to differentiate between firms that use natural hedging and those that use financial hedging techniques. Natural hedging includes techniques like the use of geographical diversification, foreign debt, leading and lagging, and matching of costs and revenues.

Financial performance, the dependent variable, indicates the extent to which financial goals of a firm have been met. Different measures of financial performance have been used in different studies. Accounting measures like Return on Assets (ROA), Return on Equity (ROE) and market-based measures like Tobin's Q are the commonly used measures. Allayannis and Weston (2001) used Tobin's Q as the proxy for firm's value. Tobin's Q, which was developed by James Tobin, compares the value of a company given by financial markets with the value of a company's assets (Li, Visaltanachoti & Luo, 2014). It indicates investors' confidence and the market's behavior in relation to the expected firm's future cash flows.

Tobin's Q is calculated as the ratio of the market value of the firm to the replacement cost of its assets. However, due to limitations in the availability of data, this study used the modified version, like in past studies, Sanda, Mikailu, and Garba (2005); Gitundu (2016), where the modified ratio is calculated as the market value of a company divided by the value of its total assets. The advantage of using Tobin's Q is that it makes comparisons across firms easier than comparison based on accounting measures where a risk adjustment or normalization is required (Allayannis &Weston, 2001). Firms with Tobin's Q greater than one have better investment opportunities, higher growth potential and an indication that management has utilized the assets under their command in an efficient way (Wolfe & Sauaia, 2003). In other words, if Tobin's Q ratio is greater than 1, it implies that investment in the firm's assets leads to earnings that are more than the firm's capital expenditures, hence increased profitability (Sucuahi & Cambarihan, 2016). This study used the modified version, due to challenges in availability of data and following similar studies like (Wolfe & Sauaia 2003; Li et al., 2014).

Firm specific factors, the mediating variable, influence the relationship between foreign exchange risk hedging techniques and financial performance. The firm specific factors considered in this study included: size, firm maturity (age), liquidity, leverage, level of foreign involvement, growth opportunities and geographical diversification. Ahmed et al. (2014) measured size as the natural logarithm of total assets and age as the natural log of the number of years since the stock of the firm first appears in the securities exchange. Many scholars have considered size and level of maturity of the firm as key factors that influence foreign exchange risk management and financial performance. Large firms are likely to fund large initial projects, thus there is a higher likelihood of hedging. Size may likely lead to higher efficiency and hence higher accounting profitability (Ahmed et al., 2014).

Allayannis and Weston (2001) in their study on the impact of foreign currency derivatives on the firm market value computed leverage as the ratio of long-term debt to shareholders' equity. Leverage may influence the financial performance of the firm. Debt financing is advantageous to the firm because interest expense is tax allowable. The tax shield may increase the value of the firm, thus leveraged firm may have higher Tobin Q. However, if a firm is highly leveraged, it faces higher probability of the financial distress. Such firms are likely to use hedging strategies to minimize the risk.

Li et al. (2014) operationalized investment opportunities as the ratio of capital expenditure to total sales, while Allayannis and Weston (2001) measured geographical diversification (multi-nationality) as a ratio of foreign sales to total sales. Investment opportunities and diversification may influence foreign exchange risk management. Firms with high investment opportunities are likely to hedge. Singhraul and Bal (2014) in their study on the exchange-rate exposure of listed Indian non-financial firms measured liquidity using the current ratio. Current ratio is equal to current assets divided by current liabilities. With regard to banks, the current assets include cash and cash equivalents, including cash held in the vaults and balances with Central Banks, treasury bills and bonds and amounts due from other banks. Cash and cash equivalents exclude the cash reserve requirement held with the Central Banks. Liquidity of the firm can encourage or discourage hedging. Firms that are highly liquid are less likely to hedge because the probability of financial distress is low. The amount of foreign sales does influence the decision of whether to hedge or not hedge. Li et al. (2014) used dummy variables to measure foreign sales; where the value of 1 is assigned if the firm had foreign sales, and a value 0 if otherwise.

Firm-specific factors had several dimensions. Factor analysis, a dimension reduction technique, was used to reduce the large dimensions indicators of firm specific factors measured in the same scale into one latent mediating variable FSF. Factor analysis is applied to a large dimension of variables when seeking to find the underlying factors from which the observed variables are generated. Factor analysis investigates whether the sets of interest are linearly related to a smaller number of unobservable factors. Factor loadings are generated to determine the relationship of observed variables and the factors. The observed variables are said to belong to the factor if they load highest with a factor loading above 0.4 (Field, 2005)

Corporate governance, the moderating variable, was measured using the following components: board size, board independence, ownership structure, and CEO duality. Allayannis et al. (2012) examined the relationship between hedging and the value of the firm under different corporate governance mechanism. The study decomposed ownership structure into larger insider block holders and larger outsider block holders, following other studies like (Lins, 2003; Lang, Lins & Miller, 2003). The largest insider block holder was defined as any firm, person or family that owns 10 percent or more of the outstanding shares and is in the firm management. Insider block holder was measured using a dummy variable which equals one if the insider largest block holder, owns 10 percent or more of outstanding shares and is in the firm management, and zero otherwise. The outsider block holder was defined as any firm or institution that owns 10 percent or more of the outstanding shares and is not in the management. The largest outsider block holder was operationalized as a dummy variable that equals one if the largest block holder is not in the firm management, and zero if otherwise.

Ahmed et al. (2015) in their study on the effect of corporate governance on agency conflicts and hedging financial risks decisions used the natural log of number of directors on the company's board, as reported by the company in the fiscal year end to measure the board size. They also measured the board independence as the percentage of independent directors of board membership excluding the chairman to the total number of board members. Allayannis et al. (2004) used dummy variables to operationalize CEO duality. CEO duality equals one if the firm's CEO is also the chairman of the board, zero if otherwise. The measurements are summarized in table 3.1 below:

Table 3.1
Operationalization of the Study Variables

Variable	Indicators	Source	Measurement	Scale Type
Foreign exchange risk hedging techniques	Financial hedging techniques	Marsden and Prevost (2005); Bartram et al. (2011)	A value of 1 is assigned if the firm reports the use of financial derivatives for hedging purpose and 0 if otherwise	Nominal Scale
	Natural hedging techniques	Judge (2006)	A value of 1 is assigned if the firm reports the use of natural hedging techniques and 0 if otherwise	Nominal Scale
Financial Performance	Firm's Value	Allayannis and Weston (2001)	**Tobin's Q**= Total Market value divided by total assets	Ratio
Firm Specific Factors (FSF)	Size	Ahmed et al. (2014)	natural logarithm of total assets	Ratio
	Maturity	Ahmed et al. (2014)	Natural log of the number of years since the stock of the firm first appeared on the NSE	Ratio
	Leverage	Allayannis and Weston (2001).	long term debt divided by shareholders' equity	Ratio
	Investment opportunities	Li et al. (2014)	capital expenditure divided by total sales	Ratio
	Liquidity	Singhraul and Bal, (2014)	Current ratio= current assets divided by current liabilities	Ratio

	Foreign sales	Li et al. (2014)	The value of 1 is assigned if the firm has foreign sales, and a value 0 if otherwise.	Nominal Scale
	Diversification	Allayannis and Weston (2001)	Foreign sales divided by total sales	Ratio
Corporate Governance	Board size	Ahmed et al. (2014)	the natural log of number of directors on the company's board, at the end fiscal year	Ratio
	Board independence	Ahmed et al. (2014)	The percentage of independent directors of board membership excluding the chairman to the total number of board members	Ratio
	Ownership structure - larger insider block holders	Lins (2003); Lang, Lins, and Miller (2003)	Equals 1 if the insider largest block holder, owns 10% or more of outstanding shares and is in the firm management, and 0 otherwise.	Nominal Scale
	Ownership structure - larger outsider block holders	Lins (2003); Lang, Lins, and Miller (2003)	Equals to 1 if the largest block holder is not in the firm management, and 0 otherwise	Nominal Scale
	CEO duality	Allayannis et al. (2004)	A value of 1 if the firm's CEO is also the chairman of the board, 0 if otherwise.	Nominal Scale

3.7 Reliability, Validity and Diagnostic Tests

This study endeavored to collect data that ensured the findings were both reliable and valid. According Kothari (2004) validity indicates the degree to which an instrument measures what it is supposed to measure. Reliability is concerned with whether the instrument provides consistent results (Tavakol & Dennick, 2011). Test of reliability, validity and diagnostics tests are discussed below.

3.7.1 Test of Reliability

Test of reliability indicates how well the different items are homogeneous and are capable of independently measuring the same concept so that the respondents attach the same overall meaning to each of the items (Sekaran, 2003). Cronbach's alpha coefficient was used to measure the internal consistency. This test was applied because it is the most commonly used test when the questionnaire has multiple Likert type questions that form a scale and the researcher wants to determine if the scale is reliable (Field, 2005). A reliability coefficient of 0.70 or higher is considered acceptable, indicating that the instrument is consistent (Kothari, 2004).

3.7.2 Test of Validity

Validity of the instrument in this study was verified using the most commonly used tests; face and content validity. Face validity refers to the degree to which the instrument appears to measure what it purports to measure (Rovai, Baker & Ponton, 2014). Face validity and content validity was assessed by consulting with finance scholars at Egerton University and University of Nairobi, who scrutinized the wording and the terminologies used, ensuring that the questionnaire was clear and free of ambiguity. The comments from the experts were used to polish the questionnaire, ensuring face and content validity.

3.7.3 Diagnostics Tests

Regression was the main method of analysis in this study. To ensure the best linear unbiased estimation (BLUE), regression models were applied and pre-regression tests were done. This section highlights diagnostic tests that were applied: panel unit root, Hausman, serial correlation, heteroscedasticity, normality and cross-sectional dependence.

3.7.3.1 Panel Unit Root test

Time series data may exhibit trending behaviour or non-stationary in their means. Panel unit root test was done to determine data stationarity in the time series dimension of the panel data. If results of the tests revealed stationarity, then the data would be used in its original form in the regression. Conversely, if the data had unit root or it was non-sationary, then the data was to be differenced to make it stationary.

The most commonly used panel data unit root tests include: Hadri test; Levin, Lin and Chu test; Im, Pesaran and Shin; and Augmented Dickey-Fuller tests. These tests give similar results. However, one may be powerful in one aspect and weak in another. The Levin, Lin and Chu (LLC) and Augmented Dickey-Fuller (ADF) were used to test for the presence of a unit root or the absence of stationarity because these tests are considered to be more robust.

3.7.3.2 Hausman Test

Firms in the panel data may have individual characteristics that may or may not affect the dependent variable. There are two different panel data regression models that are used to control the individual effect; fixed effect (FE) and Random effect (RE). FE model is appropriate if the unique error is correlated with the independent variable and RE model is appropriate if the unique error is un-correlated with the explanatory variables (Schmidheiny, 2018). To decide which model to use, Hausman test was done, where the two regression models were ran separately, results saved and analysed. The null hypothesis tested was: Random effect model is appropriate and the alternate: Fixed effect model is appropriate. When the p value is less than 0.05, the null hypothesis was rejected and alternate accepted. The FE and RE models are specified below:

The Fixed Effect model specification:

$$Y_{it} = \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + \alpha_i + u_{it} \quad \text{.....(3.1)}$$

Y_{it} = dependent variable observed for individual firms *i* in time *t*.

X_{it} = the time-variant regressor for individual firms *i* in time *t.*

$\beta_{1\ldots k}$ = the coefficient for the independent variables, where 1…*k*= number of entities

α_i = unknown intercept for each entity *i*

u_{it} = error term for individual firms *i* in time *t*.

The Random Effect model specification:

$$Y_{it} = \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + \alpha + u_{it} + \mathcal{E}_{it} \quad \text{.....(3.2)}$$

Y_{it} = dependent variable observed for individual firms *i* in time *t*.

X_{it} = the time-variant regressor for individual firms *i* in time *t.*

$\beta_{1\ldots k}$ = the coefficient for the independent variables, where 1…*k*= number of entities

α = Intercept

u_{it} = between entity error

$\mathcal{E}_{it}$ = within entity error

3.7.3.3 Serial Correlation

Serial correlation occurs when the error term from different periods are correlated. When fitting panel data regression models, it is assumed that the error term does not have serial correlation. Serial correlation will not affect the un-biasedness or consistency of OLS estimators, but causes the results to be less efficient (Drukker, 2003). The Wooldridge test was used to test for serial correlation because it can be applied under general conditions, it is easy to implement and requires relatively few assumptions. The Wooldridge test uses F-statistic as the criteria for concluding on the presence or absence of serial correlation.

3.7.3.4 Heteroscedasticity

One of the assumptions of the Ordinary Least square (OLS) regression is that the variance of the error term is constant or homoscedasticity. If the error terms do not have constant variance across the observations, then there is a heteroscedasticity problem. In panel data model estimation, the assumption of panel homoscedasticity of the error variances is made (Hsiao, 2003). This problem can undermine statistical tests of significance. Breusch and Pagan test, which uses Chi-square statistics to test the hypothesis, was used to test for heteroscedasticity. The null hypothesis for this test is that the error variances are all equal and the alternate is that the error variances are not equal. If the Chi Squared value is significant, with a low p-value below 0.05, the null hypothesis is rejected and heteroscedasticity is assumed to be present.

3.7.3.5 Normality Test

In order for regression analysis to yield reliable and valid results, it is assumed that the values of the error term are normally distributed. The non-normal error in regression or the lack of Gaussianity harms reliability of estimation and testing procedures (Alejo, Galvao, Montes-Rojas & Sosa-Escudero, 2015). The assumption of normality plays a critical role making inferences about the data. In standard regression models, the classical Bera-Jarque (JB) test, proposed by Bera and Jarque (1987) was used to detect departure from Gaussianity in the form of skewness and excess kurtosis in the regression error term.

This study used normality test proposed by Galvao, Montes-Rojas, Sosa-Escudero and Wang (2013) which is an extension of the classical Bera-Jarque (JB) test for normality for panel data. In this test, assessment for normality of the error for each component, that is, the disturbances due to individual effects u_i and the remainder component disturbance e_i, is done separately. Then the JB chi-square statistics, with two degrees of freedom, for the e and u components is determined. If the p value is less than 0.005, then the error components are not normally distributed.

3.7.3.6 Cross-sectional Dependence Test

Panel data models assume that the observations across individual units are independent. In other words there is cross sectional independence. However, observations across individual units may be inter-dependent due to the presence of common shocks and unobserved components that become part of the error term causing spatial dependence (Hoyos & Sarafidis, 2006).

Cross-sectional dependence in the study models was tested using Pesaran Friedman test. If the p-value of the Z statistic was less than 0.05, it implied the presence of cross-sectional correlation of the residuals, meaning the observations were dependent across individuals units. The presence of cross-sectional dependence in the data may decrease the estimation efficiency of the panel least-squares estimator and may provide little improvement over the single-equation ordinary least squares (Phillips & Sul, 2003).

In summary, the pre-regression diagnostic tests assisted in selecting the best linear unbiased model (BLUE). When the pre-regression assumptions are met, the ordinary least square (OLS) model is applied. However, when the assumptions are violated, then results may not be trustworthy, resulting in over- or under-estimation of significance (Osborne & Waters, 2002). In this case, other models that accommodated the violations are used. When the

assumption of constant variance is violated or there is heteroscedasticity problem, data can be transformed to achieve constant variance. Alternatively, the generalised or weighted least squares method (WLS), which is a modification of ordinary least squares, can be used. The WLS takes into account the in-equality of variance in the observations. If several assumptions are violated, the feasible generalized least square (FGLS) model can be applied. FGLS model allows for auto-correlated errors, heteroskedastic errors and cross-sectional dependence. The FGLS is also applicable when the dependent variable (Y) is a continuous variable, while the predictors might be continuous, categorical or a mixture. The FGLS procedure dominates OLS due to its standard errors, which are robust to arbitrary group correlation in terms of power and confidence interval length (Hansen, 2006). Under the FGLS model, it is possible to implement bias correction for autocorrelation coefficients of any order AR(p) which deal with the issue of serial correlation. FGLS estimates can be obtained by fitting the model allowing for panel heteroskedasticity implementing the AR coefficients bias correction to obtain a generally consistent and asymptotically normal estimate that will be efficient over the OLS estimates (Hansen, 2006).

3.8 Data Analysis

This section explains how the data collected was prepared and analysed. The data collected was coded, cleaned and screened. Coding is the process of assigning numerals or other symbols to answers, so that responses can be input into limited number of categories or classes (Kothari, 2004). Coding ensures efficiency in analysis. Cleaning and screening is the process of checking for inconsistencies and missing responses. The coded data was analysed using descriptive and inferential statistics. The descriptive statistics used included mean, median and standard deviation. Inferential statistics used includes correlation and regression analysis. The analysis was done with aid of the STATA software.

3.8.1 Correlation Analysis

The relationship between the study variables: financial hedging, operational hedging and firm specific factors, was tested using Pearson's product-moment correlation. The expected relationships between the dependent and independent variables was informed by the anchoring theory of the study—the financial economic theory of risk management—which argues that hedging lowers the volatility of cash flows, hence improving the financial performance of a firm.

The study expected a positive coefficient of the financial hedging variables in relation to the financial performance. Similarly, the study also expected a positive relationship between operational hedging variables and financial performance. This was informed by previous studies like Gleason et al. (2005) which hypothesized and found a positive relationship between financial and operational hedges and firm value, implying that financial hedging and operational hedging improves financial performance. With regard to the intervening variables, the study expected to find that the size of the firm influences the hedging activities. Larger firms are likely to hedge more. Highly leveraged firm are likely to actively manage risk and hence employ the available hedging techniques. The firms with high levels of foreign involvement are likely to use both financial and operational hedging.

3.8.2 Regression Models

To test Hypothesis 1, which states that: Foreign exchange risk hedging techniques have no significant effect on the financial performance of listed firms, multiple regression was used. Financial performance was regressed on the dimension of foreign risk hedging techniques, which are; financial and natural hedging. The following multiple regression model was used:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_{it} \quad \text{.....(3.3)}$$

Where:

Y_{it}= Financial Performance (FP)

β_0 = Y intercept

β_1 and β_2 = regression coefficients

X_1 = Financial hedging techniques

X_2 = Natural Hedging techniques

$\mathcal{E}$ = regression error term

To test Hypothesis 2 which states that, there is no significant mediating effect of firm-specific factors on the relationship between foreign exchange risk hedging techniques and the financial performance of listed firms in Kenya, the Baron and Kenny's (1986) approach was used. The Baron and Kenny (1986) approach uses four steps to test the mediating effect. The first step shows that a relationship exists between the dependent and independent variables, and that, this relationship may be mediated. The regression model below was used to test the first condition for mediation.

$$Y_{it} = \alpha_0 + \beta_3 X_{3it} + \mathcal{E}_0 \quad \text{.....(3.4)}$$

Where: Y = Financial Performance for firm i at time t

α_0 = Y intercept

β_3 = regression coefficients

X_3 = Foreign exchange risk hedging techniques

$\mathcal{E}_0$ = regression error term

The second step shows that the independent variable, foreign exchange risk hedging techniques, is related to the potential mediator, firm specific factors. Therefore to satisfy the second condition for mediation, the potential mediator was regressed on the independent variable using the regression model below:

$$M = \alpha_1 + \beta_4 X_{3it} + \mathcal{E}_{1it} \quad \text{.....(3.5)}$$

M = Mediating variable (Firm specific factors)

α_1 = y intercept

β_4 = regression coefficients

X_3 =Foreign exchange risk hedging techniques

$\mathcal{E}_1$ = regression error term

The third step is to show that the dependent variable, financial performance is related to the potential mediator, firm specific factors. Therefore to satisfy the third condition for mediation, the potential mediator was regressed on the dependent variable, using the regression model below:

$$Y_{it} = \alpha_2 + \beta_5 M_{it} + \mathcal{E}_{2it} \quad \text{.....(3.6)}$$

Y_{it} = Financial Performance

α_2 = y intercept

β_5 = regression coefficients

M_{it} = Mediating variable for firm i at time t (Firm specific factors)

$\mathcal{E}_2$ = regression error term

Lastly, the dependent variable (financial performance) was regressed on the independent variable (foreign exchange risk hedging techniques) and the potential mediator, (firm specific factors). The final condition was tested using the model below:

$$Y_{it} = \alpha_3 + \beta_6 X_3 + \beta_7 M\, \mathcal{E}_3 \quad \text{.....(3.7)}$$

Where: Y_{it} = Dependent variable (Financial Performance) for firm i at time t

α_3 = y intercept

β_6 and β_7 = regression coefficients

X_3 =Independent variable (Foreign exchange risk hedging techniques)

M = Mediating variable (Firm specific factors)

$\mathcal{E}_3$ = regression error term

To test Hypothesis 3, which states that, there is no moderating effect of corporate governance in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya, the following multiple regression model was used.

$$Y_{it} = \alpha + \beta_8 X_{3,it} + \beta_9 Z_{2,it} + \beta_{10} XZ_{it} + \mathcal{E}_{it} \quad \text{.....(3.8)}$$

Where: Y_{it} = Dependent variable (Financial Performance)

α = y intercept

β_8 = the coefficient relating the independent variable (FERH)

β_9 = coefficient relating the moderator variable, Z, (Corporate governance)

β_{10} = estimate of the moderation effect. If β_{10} is statistically different from zero, there is significant moderation of the X-Y relation.

X_3=Independent variable (FERH)

Z = Moderating variable (Corporate governance)

XZ= interaction between independent and the moderating variable

$\mathcal{E}$ = regression error term

Lastly, to test Hypothesis 4, which states that; there is no significant joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance of listed firms, the following two stage regression models were used.

First, financial performance was regressed on foreign exchange hedging techniques using the model below:

$$Y_{it} = i_0 + \beta_{11} X_{3,it} + e_0 \quad \text{.....(3.9)}$$

Y = Dependent variable (Financial Performance)

i_0 = y intercept

β_{11} = the coefficient relating the independent variable (FERH)

X_3 =Independent variable (FERH)

e_0 = regression error term

Second, the dependent variable (financial performance) was regressed on the independent variable, mediating and moderating variables. The following multiple regression model was used.

$$Y_{it} = i_0 + \beta_2 X_{3it} + \beta_{12} X_{4it} + \beta_{13} X_{5it} + e_{1it} \quad \text{.....(3.10)}$$

Where: Y= Financial Performance (FP)

i_0 = y intercept

$\beta_{12} - \beta_{13}$ = regression coefficients

X_3 = Independent variable (FERH)

X_4 = Firm specific factors

X_5 = Corporate governance

e_1 = regression error term

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This study sought to investigate the effects of foreign exchange risk hedging techniques, firm specific factors, and corporate governance on financial performance of listed firms in Kenya. To achieve this objective, this chapter presents: descriptive statistics, data analysis, results and discussions.

4.2 The Primary Data Analysis

This section presents descriptive analysis of primary data. Specifically, it presents the response rate, the reliability and validity analysis. It also provides the analysis of preliminary questions and the analysis of questions on each study variable as outlined in the questionnaire.

4.2.1 Response Rate

The unit of analysis was the firm, the legally constituted business organization. Fifty-four questionnaires were distributed to Chief Finance Officers (CFOs) and in the absence of the CFO, the questionnaire was given to the Chief Risk Managers of the publically listed firms on NSE. The researcher received 37 out of the 54 questionnaires distributed, representing an overall response rate of 68.5 percent. This response rate was considered adequate for further analysis because it was over 60 percent, which is recommended as adequate by several researchers including (Johnson & Owens, 2003; Bryman & Bell, 2007). Kothari (2004) also suggested that a response rate of 50 percent and above is acceptable for analysis.

4.2.2 Reliability and Validity Analysis

To achieve the objective of the study, validity and reliability of the research instrument was assessed. Reliability of an instrument indicates how well the different items are capable of independently measuring the same concept, such that the respondents attached the same meaning to each of the items. The reliability of the questionnaire was evaluated using Cronbach's alpha, a measure of internal consistency. Table 4.1 below, summaries the results

Table 4. 1

Reliability Statistics of the Research Instrument

Overall Reliability Statistics	
Cronbach's Alpha	Number of Items
.950	56

Cronbach's Alpha Coefficients for Individual Constructs

Variable	Cronbach's Alpha	Number of Items
Financial Hedging Techniques	.874	12
Natural (Operational) Hedging Techniques	.823	12
Firm Specific Factors	.901	19
Corporate Governance	.787	13

Table 4.1 above shows that financial hedging techniques, natural (operational) hedging techniques, firm specific factors and corporate governance had Cronbach's alpha of .874, .823, .901, and .787 respectively. The overall Cronbach's alpha for all constructs was 0.95, indicating a high level of reliability. Therefore, the instrument met the recommended reliability threshold of 0.7, (Kothari, 2004).

Validity of the instrument, which indicates the extent to which the questionnaire measured what it was supposed to measure, was evaluated from two perspectives: face and content validity. Face validity, which is concerned with how the instrument was designed, for example the size of the font and formatting, was tested using existing scales that have been authenticated by other researchers and recommended by Egerton's Graduate School guidelines. Content validity, which is concerned with correct language usage and clarity of instructions, Fraenkel & Wallen (2003), was assessed with the help of finance scholars from Egerton University, who checked the wordings and terminologies used in the questionnaire. The recommendations of these experts were incorporated into the questionnaire.

4.2.3 Descriptive Analysis for Primary Data

Primary data collected were mainly measured on categorical scales considering both nominal and ordinal measurements. Most ordinal scale indicators were mainly measured on a Likert scale of 5. Based on the scale of measurement for each indicator, the appropriate measures of central tendency and measures of dispersions were chosen. Nominal scale measured variables

were analysed and reported using the mode as the measure of central tendency and the percentage distribution to report the dispersion. Variables measured on an ordinal scale were analysed and reported using the median and mode as measures of central tendency.

4.2.3.1 Profile of the Respondents

The study initially tried to understand the organisational profile of the firms. Most of the preliminary questions were measured on a nominal categorical scale. These questions were analysed and presented using frequency tables, with the mode used as the measure of central tendency.

Table 4.2

Ownership Structure of the Listed Firms

Ownership	Frequency	Percent	Cumulative Percent
Local	97.3	97.3	97.3
Foreign	2.7	100	2.7
Total	100		100

The results in table 4.2 above show that 97.3 percent of the listed firms are locally owned, while only 2.7 percent of the respondents indicated that majority ownership is held by foreign investors. The ownership, whether local or foreign, was considered to be important for this study, because foreign exchange risk hedging strategies may differ between local firms and subsidiaries of foreign firms. For instance, foreign owned firms due to their international exposure and orientation, are also inclined to engaging in hedging activities more than locally owned firms. Larger firms, with greater international presences are likely to have greater potential to acquire valuable information, which help in risk management than smaller domestic firms because larger firms can hire better analysts and have a more expansive market footprint (Adam, Fernando & Salas, 2015).

Table 4.3

Major Markets for the Listed Firm's Products

Market	Frequency	Percent	Cumulative Percent
Local	20.6	20.6	20.6
Foreign	2.9	23.5	2.9
Local and foreign	76.5	100	76.5
Total	100		100

The respondents were also asked about the major market for their products. The responses are presented in table 4.3 above. Majority, 76.5 percent of the firms, sell their products in both foreign and domestic markets. Another 20.6 percent sell to only domestic markets while only 2.9 percent sell exclusively to foreign markets. This implies that firms listed on NSE are exposed to currency risk because they sell their products across borders, using different currencies such as US dollars, Euros, British Pounds, Chinese Yuan and Japanese Yen, to mention but a few. The percent of foreign sales is considered important because the levels of international activities have a bearing on foreign risk exposure and the management of such risk (Solakoglu, 2005).

Table 4.4

Major Foreign Currencies used in the Foreign Trade by the Listed Firms

Currency	Frequency	Percent	Cumulative Percent
US Dollars	89.2	89.2	89.2
Sterling Pound	2.7	91.9	2.7
Euro	2.7	94.6	2.7
others	5.4	100	5.4
Total	100		100

The study also sought to determine the major currencies used in the foreign trade by the listed firms in Kenya. From table 4.4 above, the results indicate that 89.2 percent use the US dollar, 2.7 percent use the Sterling Pound, and 2.7 percent use the Euro while 5.4 percent use other currencies (mainly the currencies of African countries such as Uganda, Rwanda, Tanzania and South Africa). However, the US dollar featured prominently because of its wide acceptance as the currency of choice for international trade. Indeed the results show majority of the listed firm use the US dollar. During the study period, for instance, the Kenyan shilling recorded high fluctuations against the US dollar, and the results show majority of the listed firm use the US dollar. This is a clear indication that these firms were exposed to foreign exchange risk, hence the need to apply hedging techniques to minimise the exposure.

4.2.3.2 Foreign Exchange Risk Hedging Techniques

Foreign risk hedging techniques were decomposed into two dimensions: financial hedging and natural hedging techniques. Each of the dimensions was further measured using various

hedging technique indicators. In addition, respondents were also asked about the percentage of foreign risk hedged by either of the techniques. This variable was measured on an ordinal categorical scale of 5. Results are presented below.

Table 4.5
Amount of Foreign Exchange Risk Hedged

Scale	0- 10%	11- 25%	26 -50%	51 – 75%	76-100%	Mean	Std. dev.
Percentage	%	%	%	%	%		
Foreign exchange risk hedged	44	22	14	3	17	1.514	0.69

From table 4.5 above, the results show that 44 percent of the firms hedge less than 10 percent of foreign exchange risk, while on average, 22 percent of the firms hedge between 11 to 25 percent of the foreign exchange risk. Up to 20 percent hedge more than 50 percent of their foreign exchange risk, with only 17 percent hedging more than 75 percent of the foreign risks. The mean score was found to be 1.514 with a standard deviation of 0.69. The mean implied that on average, firms hedge between 0 to 25 percent of foreign exchange risks. The standard deviation of is also low, presenting a low spread and that data points lie around this average. Hedging of foreign exchange risks is not common and a large amount of foreign exchange (75 percent or more) risk is not hedged. Hoberg and Moon (2014) assessed the explanation why many firms that participate in international trade do not actively hedge despite the availability of alternatives that are cheaper than financial derivative. The study found that firms do not hedge foreign exchange risks because of incomplete and underdeveloped derivative markets. The derivative markets are not fully developed in Kenya, which explains the minimal hedging activities.

On the financial hedging techniques, the respondents were asked a number of questions as indicators of the techniques they adopt. The respondents were asked how frequently they use the various financial hedging techniques on an ordinal scale of 1 to 5. The results are presented in table 4.6 below.

Table 4.6

Financial Hedging Techniques used by the Listed Firms

Scale	Never (%)	Some-times (%)	Often (%)	Very Often (%)	Always (%)	Mean	Std. dev
1. Forward contracts	49	17	20	14	0	2.250	1.481
2. Futures contracts	42	19	19	17	3	2.000	1.138
3. Swaps	63	9	14	11	3	2.194	1.238
4. Options	39	19	14	3	25	1.829	1.224
5. Foreign currency denominated debt	74	10	3	3	10	2.556	1.629
Overall mean score						2.166	1.342

Form the results presented in table 4.6 above, forward contracts had a mean of 2.250 with a standard deviation of 1.481. It was found that 49 percent of the firms never use forward contracts, 17 percent of the firms sometimes use this technique, 20 percent often use it, while only 14 percent use forward contracts very often. Future contracts have a mean score of 2 and a standard deviation of 1.138. Nearly half of the firms, specifically 42 percent, never use future options while 19 percent sometimes use this technique. On the other hand, 38 percent of the firms either: never use it, sometimes uses it or often use it, while 17 percent use it very often. Only 3 percent always uses future contracts. With regard to the use of swaps, 63 percent never use swaps, 9 percent of the firms either never use it or just use it sometimes, while 14 percent often use it and another 11 percent either use swaps very often or always. Options had a mean score of 1.829 and as standard deviation of 1.224. As shown in the table 4.6 above, 39 percent of the firms never use it, 19 percent sometimes uses while14 percent or often use it. 25 percent of the firms always use it while only 3 percent use it very often.

The results indicate that the financial hedging techniques were never used by majority of the firms as shown by the modes of 1 on all the techniques. The means of all techniques lie between 1.829 and 2.556, showing that on average that, the firms sometimes used the hedging techniques. The overall score mean of the usage of the financial risk hedging techniques was 2.166 with a standard deviation of 1.342. This further showed that overall; firms sometimes used forward contracts, future contracts, swaps, options and foreign

currency denominated debt for financial hedging. Foreign currency denominated had the highest means, meaning it was the most preferred financial hedging techniques. This is contrary to some empirical studies have like Mumoki (2009) and Mwangi (2013) which found that the commonly used financial derivatives in Kenya are futures, forwards and swaps.

Further on financial hedging techniques, the respondents were asked to describe the possible effect of the techniques on financial performance in their firm. The results are presented in table 4.7 below with the mean as the measure of central tendency. Dispersion was reported by the percentage frequency distribution and the standard deviation.

Table 4.7

Influence of Financial Hedging on Financial Performance

Scale	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly disagree (%)	Mean	Std. dev
1. Increase profits	19	6	19	17	39	3.500	1.540
2. Increase costs	22	6	22	44	6	3.056	1.286
3. Reduces earnings volatility	17	25	19	11	28	2.917	1.296
4. Increase the market value of the firm	22	8	28	22	19	3.083	1.422
Overall mean score						3.078	1.381

From the table 4.7 above, 19 percent of the respondents strongly disagreed that financial hedging increases profits, 6 percent disagreed and 19 percent were neutral while 56 percent agreed or strongly agreed that financial hedging increases profits. The mean score was 3.5. Considering the effect of financial hedging on cost, 44 percent were in agreement that financial hedging affects costs, while 22 percent of the respondents strongly disagreed. On the other hand, 22 percent of the respondents were neutral, while only 6 percent strongly agreed that hedging increases costs. Notably, 28 percent, agreed that hedging reduces earnings volatility. However, 61 percent of the respondents were either neutral, disagreed or were in strong disagreement with this.

The mean scores on each of the possible influences were approximately 3. The overall mean score for the effect of financial hedging was also found to be 3.078. The mean of 3 imply that on average the respondents were neutral to the perception that financial risk hedging could influence performance of the firms. The standard deviation was found to be 1.382 which shows a low spread out of 5 implying low possibilities of having respondents with high perceptions on how hedging positively influences performance. The indifference by the respondents on whether financial hedging influences performance could be attributed to lack of adequate knowledge on the importance of financial hedging and could be the reason for low levels of usage of the hedging techniques.

On the natural hedging, the respondents were asked a number of questions on the types of natural (operational) hedging techniques used by their firms. The respondents were asked about the frequency with which they used the natural hedging techniques on an ordinal scale of 1 to 5. The results are presented in table 4.8 below.

Table 4.8

Natural Hedging Techniques used by the Listed Firms

Scale	Never (%)	Some-times (%)	Often (%)	Very Often (%)	Always (%)	Mean	Std. dev
1. Diversification across countries	29	11	6	17	37	3.229	1.716
2. Matching costs and revenues	17	11	26	14	31	3.314	1.471
3. Netting inter-firm cash flows	31	20	29	11	9	2.457	1.291
4. Currency choice in invoicing	29	26	26	9	11	2.486	1.314
5. Price adjustments	29	15	9	35	12	2.853	1.480
6. Leading and lagging	36	8	39	14	3	2.389	1.202
Overall mean score						2.788	1.412

As shown in table 4.8, the firms had a mean score of 3.229 on diversification across countries with 37 percent indicating having subsidiaries in different countries. An average number of respondents, 31 percent, indicated that they always use matching costs and revenues, while majority very often use price adjustments shown by the mode of 4. Majority of them were neutral to the use of leading and lagging with a mode of 3 while majority, 36 percent, never used netting inter-firm cash flows and currency choice in invoicing with modes of 1.

The mean scores on diversification and matching of cost revenues were about 3 while the means of the other natural hedging techniques were below 3 but about and above 2. This shows that most firms used geographical diversification, matching of revenues and costs; as compared to other natural hedging techniques. The overall mean score for natural hedging techniques was found to be 2.788 with a standard deviation of 1.412. The mean score is above 2 but just below 3 implying that on average, the natural hedging techniques are sometimes or often used by the firms. This implies that listed firms in Kenya use geographical diversification to hedge. This is supports that the proposition that geographical diversification influences the effectiveness of hedging on financial performance (Aktas et al., 2013). Giraldo-Prietoa et al. (2017) also found that geographical diversification, had positive impact on the market value of the firms.

The respondents were asked to describe possible effects of natural hedging techniques on financial performance in their firm. The responses were closed on an ordinal scale of 5. The results are presented in table 4.9 with the mode (percentage frequencies) and the mean as measures of central tendency and the frequency distributions and standard deviations to report the dispersion

Table 4.9

Influence of Natural Hedging on Financial Performance

Scale	Strongly disagree (%)	Dis-agree (%)	Neutral (%)	Agree (%)	Strongly disagree (%)	**Mean**	**Std. dev**
1. Increase profits	19	6	31	33	11	3.111	1.282
2. Increase costs	14	11	31	28	17	3.222	1.267
3. Increase the possibility of financial distress	14	19	28	17	22	3.139	1.355
4. Increase earnings volatility	11	19	31	25	14	3.111	1.214
5. Increase the market value of the firm	14	8	28	39	11	3.250	1.204
6. Maintain competitive advantage	8	25	39	11	17	3.028	1.183
Overall mean score						3.144	1.251

Majority of the respondents were neutral concerning the effects of natural hedging and whether the technique increases costs, increases the possibility of financial distress, increases

earnings volatility and maintenance of competitive advantage. The indicators had modes of 3, which were all with majority frequency percentages of 31 percent, 28 percent, 31 percent and 39 percent respectively. For these indicators, 45 percent, 39 percent, 39 percent and 28 percent were either in agreement or strong agreement. Majority, 33 percent agreed that natural hedging increases profits with only 11percent strongly agreeing, and 56 percent either neutral, or in disagreement. On whether hedging led to or did not lead to reduced market value, 39 percent agreed, 11 percent strongly agreed, 28 percent were neutral, while 22 percent disagreed or were in strong disagreement.

The mean scores of the influence natural hedging on financial performance were all about 3 implying, neutral perceptions on the different possible influences on performance. The overall mean score of the effects of natural hedging techniques was 3.144 with a standard deviation of 1.251. This mean is also about 3 implying that the respondents in general have a neutral perception towards how natural hedging influences performance of the firms. The spread is also low implying that most observations are about the average of neutral perception. However, most respondents believe that natural hedging influences the market value of the firm, which had a mean score of 3.250. This corroborate the earlier empirical findings that operational hedging decreases exchange risk exposure and increases its stock returns (Choi and Jiang, 2009).

4.2.3.3 Firm Specific Factors

Firm specific factors had multi-dimensional constructs, with each dimension measured by various indicators, which were on a categorical ordinal scale. The respondents were presented with statements that described aspects of firm specific factors that influence foreign exchange risk hedging techniques. The indicators of firm size were: total annual sales, the market value of the firm's total sales and the firm's total equity capital.

Table 4.10

Influence of Firm Specific factors on Financial Performance

Scale	Strongly disagree (%)	Dis-agree (%)	Neutral (%)	Agree (%)	Strongly disagree (%)	**Mean**	**Std. dev**
1. The firm's total annual sales.	18	12	36	21	12	2.970	1.262
2. The market value of the firm's total assets	12	12	18	47	12	3.353	1.203
3. The firm's total equity capital	12	12	15	38	24	3.500	1.308
Overall mean score						3.274	1.258

The results in table 4.10 above indicate that respondents were averagely neutral to the firm's total annual assets influencing foreign risk hedging with a mean of 2.97. However, on average, the respondents were in agreement that risk hedging is influenced by the market value of the firm's total assets and the firm's total equity capital. Each had a mode of 4. Thirty percent of the respondents were either in disagreement or strong disagreement on the influence of the total annual sales, while 42 percent were neutral, in disagreement or strong disagreement on the influence of market value of total assets. Thirty nine percent of the respondents were neutral, were in disagreement or strong disagreement on the influence of total equity capital on foreign risk management.

The mean scores of the influences of firm specific factors on financial performance were all about 3. The overall mean score of the firm specific factors was found to be 3.274 with a standard deviation of 1.258. The mean score of 3.274 imply that the respondents have and almost neutral perception on whether the firm specific factors influence the performance. The total market value of assets and total equity capital had means of 3.353 and 3.500 respectively, implying that the size of the firms has significant influence on financial performance. There is strong evidence that size and international business involvement influence the exchange hedging techniques (Al-Momani & Gharaibeh, 2008).

The level of foreign involvement, another dimension of firm specific factors, was measured in three ordinal categorical variables on a scale of 5. Table 4.11 below presents the results.

Table 4.11

Level of Foreign Involvement

Scale	Strongly disagree (%)	Dis-agree (%)	Neutral (%)	Agree (%)	Strongly disagree (%)	**Mean**	**Std. dev**
1. The percentage of export revenue to total revenue	12	6	6	56	21	3.677	1.224
2. The percentage of import expenditures to total costs	12	12	6	53	18	3.529	1.261
3. The percentage of foreign denominated debt to total debt	21	18	18	35	9	2.941	1.324
Overall mean score						3.382	1.270

From Table 4. 11 above, the mode of all the three variables was 4, as implied by the highest percentages. Majority of the respondents agreed, though not strongly, that each of the indicators of level of foreign involvement influences foreign risk hedging techniques. On average, 24 percent of the respondents disagreed that export revenue affects level of foreign involvement, while up to 21 percent were in strong agreement. In regard to influence of import expenditures, 30 percent of the respondents were either neutral, in disagreement or in strong disagreement that import expenditures influence foreign risk management while up to 18 percent strongly agreed. On foreign denominated debt to total debt ratio, 21 percent strongly disagreed, while nine percent strongly agreed that foreign debt influences hedging techniques.

The mean scores of the perceptions of the respondents on the percentage of export revenue to total revenue and that on the percentage of import expenditures to total costs were above 3.5 thus implying a level of neutrality leaning towards agreement. The mean score on the percentage of foreign denominated debt to total debt was 2.941 implying an average neutral perception on this. The overall mean score was found to be 3.382 with a standard deviation of 1.270. This implies that most respondents, on average believe the level if international involvement influences hedging decisions. Firms with that have foreign operations are likely

to hedge and that foreign sales influences the hedging techniques adopted the their effectiveness (Aktas et al., 2013).

4.2.3.2 Financial Performance

Financial Performance was measured using Tobin's Q, which was computed using data provided by the respondents. Tobin's Q, measured on an interval scale, was analysed with the mean as the measure of central tendency and the standard deviation as the measure of dispersion. The average Tobin's Q from the data collected was 0.875 with a standard deviation of 1.137 as shown in table 4.12 below.

Table 4.12

Tobin's Q -Measure of Financial Performance

	TQ
Mean	0.875
Std. Deviation	1.137
N	37
Minimum	0.06
Maximum	5.8

4.3 Descriptive Analysis of Secondary Data

This section presents descriptive analysis of secondary data. This data was organised in panels. The study used data from a period of six years, from 2011 to 2016 for 54 firms that were continuously listed on NSE during the study period.

4.3.1 Foreign Exchange Risk Hedging Techniques

The independent variable was foreign exchange risk hedging techniques whose influence on financial performance was sought in the study. Foreign exchange risk hedging techniques was measured using financial hedging techniques and natural hedging techniques as the indicators. Both were measured on a binary categorical scale.

Table 4.13

Foreign Exchange Risk Hedging Techniques

	Dummy Variable	Proportion	Std. Err.	Binomial Wald [95% Conf. Interval]	
Financial Hedging	0=Does not use	.759	.0239	.712	.805
	1= uses	.241	.0239	.195	.288
Natural Hedging	0= Does not use	.505	.0279	.450	.560
	1=uses	.495	.0279	.441	.550

Table 4.13 presents a summary of both financial and natural hedging techniques. Similar to Marsden and Prevost (2005); Bartram et al. (2011) the hedging techniques were measured using dummy variables where the value of 1 was assigned if the firm reported the use of financial derivatives for hedging purpose and 0 if otherwise. Also the value of 1 was assigned to firms that used natural hedging and 0 if otherwise. Amongst all the listed firms, 50 percent use natural hedging and 50 percent do not use natural hedging. On the other hand, 24 percent use financial hedging and 76 percent do not use financial hedging. This is consistent with the finding of Afza and Alam (2016) which revealed that fewer firms in developing countries use financial derivatives compared to their counterparts in developed countries. Majority of Kenyan firms use natural hedging techniques.

Table 4.14

One-way Tabulation Panel Statistics for Financial Hedging

	Overall		Between		Within
Financial Hedging	Freq.	Percent	Freq.	Percent	Percent
Not practicing financial hedging	246	75.93	41	75.93	100
Practice Financial hedging	78	24.07	13	24.07	100
Total	324	100	54	100	100

Table 4.14 shows the one-way tabulations for financial hedging. The counts are decomposed into between and within components of the panel data. Overall, 75.93 percent of all the entity-years reported no financial hedging, while only 24.07 percent reported financial hedging practice. The “between” proportions show that 75.93 percent of all the entities did not use financial hedging. This proportion is equal to the overall proportion, implying that the

entire overall proportion was due to the variability within the entities. The 100 percent within component implies that financial hedging was a time invariant variable.

Table 4.15

One-Way Tabulation Panel Statistics for Natural Hedging

	Overall		Between		Within
Natural Hedging	Freq.	Percent	Freq.	Percent	Percent
Natural Hedging not used	168	51.85	28	51.85	100
Natural hedging used	156	48.15	26	48.15	100
Total	324	100	54	100	100

Table 4.15 presents the tabulation for natural hedging. This variable was also shown to be time invariant as indicated by within percentages, which were 100 percent. The overall proportions of firms that do not use natural hedging was 51.85 percent, which was all due to the total proportions of 51.85 percent of firms not practicing natural hedging as shown by the between percentages. 48.15 percent of the entities practiced natural hedging all through the years.

4.3.2 Firm Specific Factors

The mediating variable, firm specific factors (FSF), was measured using a set of seven indicators: size, maturity, leverage, investment opportunities, liquidity, foreign sales and geographical diversification. These were measured on a continuous scale except for foreign sales, which was on a binary categorical scale following other previous studies like (Li et al., 2014).

Table 4.16

One-Way Tabulation Panel Statistics for Foreign Sales

	Overall Variations		Between Variations		Within Variations
Foreign sales	Freq.	Percent	Freq.	Percent	Percent
No foreign sales	91	28.09	18	33.33	84.26
Has foreign sales	233	71.91	41	75.93	94.72
Total	324	100	59	109.26	91.53
	(n=54)				

The variable foreign sales was measured on a binary categorical scale of 0 and 1 where, 0 implied no foreign sales and 1 represents foreign sales made in the entity year. As shown in table 4.16, on overall, only 28.09 percent of the entity years had no foreign sales while 71.91 percent had foreign sales. The between percentage shows different proportions with 33.33 percent of the entities with no foreign sales and 75.93 percent had foreign sales, totalling to 109.26 percent. This means there were firms, which sometimes had no foreign sales and at other times had foreign sales. The total of entities of 59 shows entities having either foreign sales or no foreign sales, which is higher than the 54 entities in the dataset implying that on some years some firms had foreign sales and in others they had no foreign sales. The difference in overall and between is further explained by the within proportions which show the conditional fraction an entity had foreign sales or had none. The results show that, given that an entity had no foreign sales, then 84 percent of the entities' observations showed no foreign sales while for entities that had foreign sales then 94.72 of their observations showed foreign sales.

Table 4.17
Other Firm Specific Factors

Variable	Variations	Mean	Std. Dev.	Min	Max	Observations		
Size	overall	23.400	2.082	17.334	27.112	N	=	324
	between		2.077	17.862	26.748	n	=	54
	within		0.295	21.950	24.369	T	=	6
Maturity (Age)	overall	35.000	17.294	5.000	70	N	=	324
	between		17.345	7.500	67.500	n	=	54
	within		1.700	32.574	37.574	T	=	6
Leverage	overall	0.580	1.599	0.000	20.327	N	=	324
	between		1.057	0.000	6.507	n	=	54
	within		1.207	-5.927	14.400	T	=	6
Investment opportunities	overall	4.577	21.200	-4.830	282.59	N	=	324
	between		14.801	-0.837	74.180	n	=	54
	within		15.269	-69.343	212.987	T	=	5.981
Liquidity	overall	1.983	2.843	0.000	30.2	N	=	324
	between		1.959	0.245	11.103	n	=	54
	within		2.073	-3.950	24.950	T	=	6
Geographical Diversification	overall	0.457	2.241	0.000	25.764	N	=	324
	between		1.159	0.000	7.337	n	=	54
	Within		1.923	-6.880	21.848	T	=	6

The overall between and within variations calculated for all the indicators were 324 entity-years of the data. The between variations were 54 entities and the average number of years per entity calculated was 6. The firm size was operationalized using the natural logarithm of total assets following previous studies (Ahmed et al., 2014). The mean of size was 23.4 compared to 16.15 as observed by Gitundu (2016) in her study on publicly listed firms in Kenya. The mean log of assets, 23.4 varied from 17.334 to 27.112, with a standard deviation of 2.082. The variation of size across entities of 2.077, as depicted by the deviation between, is almost equal to the overall standard deviation for an entity over time. The slight variation of size is due to the changes of time within an entity.

The mean age (maturity) of the listed firms was 35.00 with an overall range of 5 to 70 years. Kenyan firms are relatively young compared to those in developed world. Young and newly incorporated listed firms are less likely to be active in hedging (Ahmed et al., 2015). Lievenbruck and Schmid (2014) found that a firm's size has important economic impact in any financial policies and, in particular, hedging decisions. The overall variation of 17.294 for an entity over time is entirely due to the deviation between groups across the entities of 17.345 with only a 1.700 variation due to time within each entity.

The leverage of these listed firms had an average of 58 percent. Highly levered firms are likely to hedge since high levels of debt increases probability of financial distress. The mean of the liquidity of these firms over the study period was 1.98; ranging between 2.843 and 30.2. This result indicates that most these firms are liquid. Firms with an adequate liquidity level are less likely to hedge because the risk of financial distress is minimal. According to Singhraul and Bal (2014) firms that are highly liquid are less likely to actively engage in hedging since they are able to meet financial obligations, minimizing the risk of financial distress. Approximately 72 percent of the listed firms have foreign sales, implying that there is a greater probability of foreign exchange risk, which suggests a likelihood of hedging in order to minimize the currency risk exposure. In addition, 45 percent of the listed firms are geographically diversified, which increases the likelihood of foreign exchange risk exposure.

To reduce the dimensions of the mediating variable, factor analysis procedure was applied. It showed that the items under firm-specific factors do not all belong to one construct as indicated by the factor loadings in table 4.18 below.

Table 4.18

Factor Analysis for Firm Specific Factors

	Factor loadings				
Variable	**Factor1**	**Factor2**	**Factor3**	**Factor4**	**Uniqueness**
Size	-0.573	0.067	0.002	-0.003	0.668
Age	0.510	0.107	0.032	0.008	0.727
Leverage	-0.013	0.251	-0.061	0.008	0.933
Invopp	-0.080	-0.157	0.03	0.019	0.968
Liquidity	0.372	-0.085	-0.088	-0.009	0.847
Geodiv	0.113	0.054	0.166	-0.007	0.957

Note: Invopp=investment opportunity, Geodiv= Geographical diversification

Table 4.18 above shows that the firm age and firm size both load factor 1 above 0.4 implying that the two variables have strong association to factor 1 but do not load any of the other factor higher than 0.4. The other hypothesized indicators do not load factor 1 or any other factor highly and do not belong to a common factor but are independent specific factors. This indicates that age and size can both measure one factor but the rest of the items are independent variables that do not show un-dimensionality to a construct. The items; size and age, were therefore each considered as an independent firm specific factor and are used in the further analyses.

4.3.3 Corporate Governance

Corporate governance, the moderating variable was measured by a set of indicators: CEO duality, ownership structure, board size and board independence. Ownership structure and CEO duality were measured in binary categorical scales following studies like (Lang, et al., 2003).

Table 4.19

Chief Executive Officer Duality

	Overall		Between		Within
CEO duality	**Freq.**	**Percent**	**Freq.**	**Percent**	**Percent**
CEO doubles as the Chair of the Board	0	0	0	0	0
CEO not the Chair of the Board	323	100	54	100	100
Total	323 (n=54)	100	54	100	100

Note: CEO= Chief Executive Officer

CEO duality binary scale measurement took the value of 1 if the firm's CEO is also the chairman of the board, 0 if otherwise. As shown in table 4.19, the overall between and within percentages are 100 percent, implying that all the CEOs of the entities for all the six years were not chairs of the boards. The variable had no variation and was therefore not used for further analysis.

Table 4.20

Ownership Structure of the Listed Firms

	Overall		Between		Within
	Freq.	**Percent**	**Freq.**	**Percent**	**Percent**
BH not in management	258	79.63	43	79.63	100
BH in management	66	20.37	11	20.37	100
Total	324 (n=54)	100	54	100	100

Note: BH= Block-Holder

The ownership structure was also measured on a categorical scale where the value 1 was assigned if the largest block holder (outsider) was not part of firm's management and 0 otherwise, following (Allayannis et al., 2012). In table 4.20 above, the overall entity year's proportions show that only 20.37 percent of the entities had the largest insider block holder while 79.63 percent of the firms had the largest outsider block holder. This variable was time invariant as shown by the 100% within-variations for both categories. This implies that the entire overall percentages were similar to the between percentages of ownership structures across entities. Large outsider block holders tend to monitor managers' actions; thus, the

presence of large outsider block holders should result to a positive relationship between hedging and financial performance of the firm value. However, concentrated ownership like a high ratio of family ownership with highest control were less likely to use derivatives for hedging purposes due to concentrated owners' vested interests (Butt et al., 2018).

Table 4.21
Board Size and Board Independence

Variable	Variations	Mean	Std. Dev.	Min	Max	Observations		
Number of directors	overall	8	2.347	4	15	N	=	324
	between		2.341	4	15	n	=	54
	within		0.334	6	10	T	=	6
Number of independent directors	overall	6	2.241	2	11	N	=	324
	between		2.233	2	11	n	=	54
	within		0.337	4	9	T	=	6
Proportion of independent directors	overall	0.729	0.161	0.182	1	N	=	324
	between		0.159	0.182	1	n	=	54
	within		0.028	0.612	1.012	T	=	6

Table 4.21 above shows that the average board of these firms had eight members, ranging from 4 to 15 on overall for each entity year. The overall variation, depicted by a standard deviation of 2.347, was due to variation between groups of entities. The average board size in this study was consistent with average size in previous studies, both local and international. Aduda, Chogii and Magutu (2013) found the mean size of the board of listed firms in Kenya was 7.73, while De Andrés and Vallelado (2008) found the average size of the board for OECD banks was 16 members.

Board independence was determined as a ratio of the number of independent directors to the total number of directors. The average board independence was 6.16, with an overall standard deviation of 2.241 and variation between had a standard deviation of 2.233, which was almost equal to the overall variation. The average percentage of board independence was 72.9 percent with an overall standard deviation of 16.1 percent and variation between shown by a standard deviation of 15.9 percent, which is almost equal to the overall variation. Only 2.8 percent of the variation in the proportion of independent directors was due to time within the entities.

4.3.4 Financial Performance of the Listed Firms

The dependent variable, financial performance, was measured on a continuous scale using the indicator Tobin's Q. Tobin's Q was calculated as the total market value divided by total assets of the firm. The market value was a composite measure of market shares and market share prices. The market value was also calculated from the number of shares and the share market price. All these indicators are measured on a continuous scale. Table 4.22 below shows the results on the items used to calculate Tobin's Q.

Table 4.22

Financial Performance of Listed Firms

Variable		Mean	Std. Dev.	Min	Max	Observations		
Number of shares in '000,000s	Overall	1420	5440	1.2	40100	N	=	324
	Between		5480	1.4	40000	n	=	54
	Within		229	492	4790	T	=	6
Share market price	Overall	80.72	144.924	1.300	1085	N	=	324
	Between		133.704	2.542	656.833	n	=	54
	Within		58.336	-330.11	557.219	T	=	6
Total market value in '000,000s	overall	30600	77200	38.6	767000	N	=	324
	between		69900	151	456000	n	=	54
	within		33900	-308000	341000	T	=	6
Total assets in '000,000s	overall	64400	100000	33.7	595000	N	=	324
	between		96300	59.4	422000	n	=	54
	within		30800	-66900	238000	T	=	6
Tobin's Q	overall	1.095	2.967	0.020	41.950	N	=	324
	between		2.095	0.060	12.987	n	=	54
	within		2.117	-11.231	30.059	T	=	6

Table 4.22 shows a summary of statistics of the indicators used to determine Tobin's Q. All the components showed high overall variation, which are time variant but depict higher variation between groups of the entities than within. The mean of number of shares, share market value and total assets in billions were found to be 1420, 30600 and 64400 respectively with high overall variations of 5440, 77200 and 100000 respectively.

Tobin's Q, used as the measure of the firm's financial performance, had a mean 1.095. This implied that majority of these firms are overvalued and the management is utilizing the assets under their command efficiently. If the value of Tobin's Q is less than one, it means the company is undervalued and the management is not creating value for the shareholders. The variation of Tobin's Q is however large implying a risk of undervaluation. The overall variation depicted by a standard deviation of 2.967 is reflected both in the variation between and within with standard deviations of 2.095 and 2.117 respectively. The summary of year-to-year indicators of financial performance is present below.

Table 4.23

Summary of Year to Year Tobin's Q

	Year	Mean	Std. Dev.	Min	Max
Total market value (millions)	2011	15,900	27,500	39	136,000
Total assets (millions)		45,200	68,300	56	331,000
Tobin's Q		0.710	1.084	0.020	6.620
Total market value (millions)	2012	23,200	43,400	39	210,000
Total assets (millions)		51,400	77,000	56	368,000
Tobin's Q		0.805	1.179	0.020	5.400
Total market value (millions)	2013	33,900	69,900	39	434,000
Total assets (millions)		60,100	87,700	59	391,000
Tobin's Q		0.997	1.583	0.030	7.110
Total market value (millions)	2014	40,100	88,100	141	563,000
Total assets (millions)		65,700	97,200	34	377,000
Tobin's Q		1.852	5.813	0.060	41.950
Total market value (millions)	2015	36,100	95,200	159	653,000
Total assets (millions)		78,700	120,000	62	468,000
Tobin's Q		1.271	3.027	0.040	20.240
Total market value (millions)	2016	34,400	107,000	114	767,000
Total assets (millions)		85,600	134,000	89	595,000
Tobin's Q		0.936	2.176	0.020	13.700

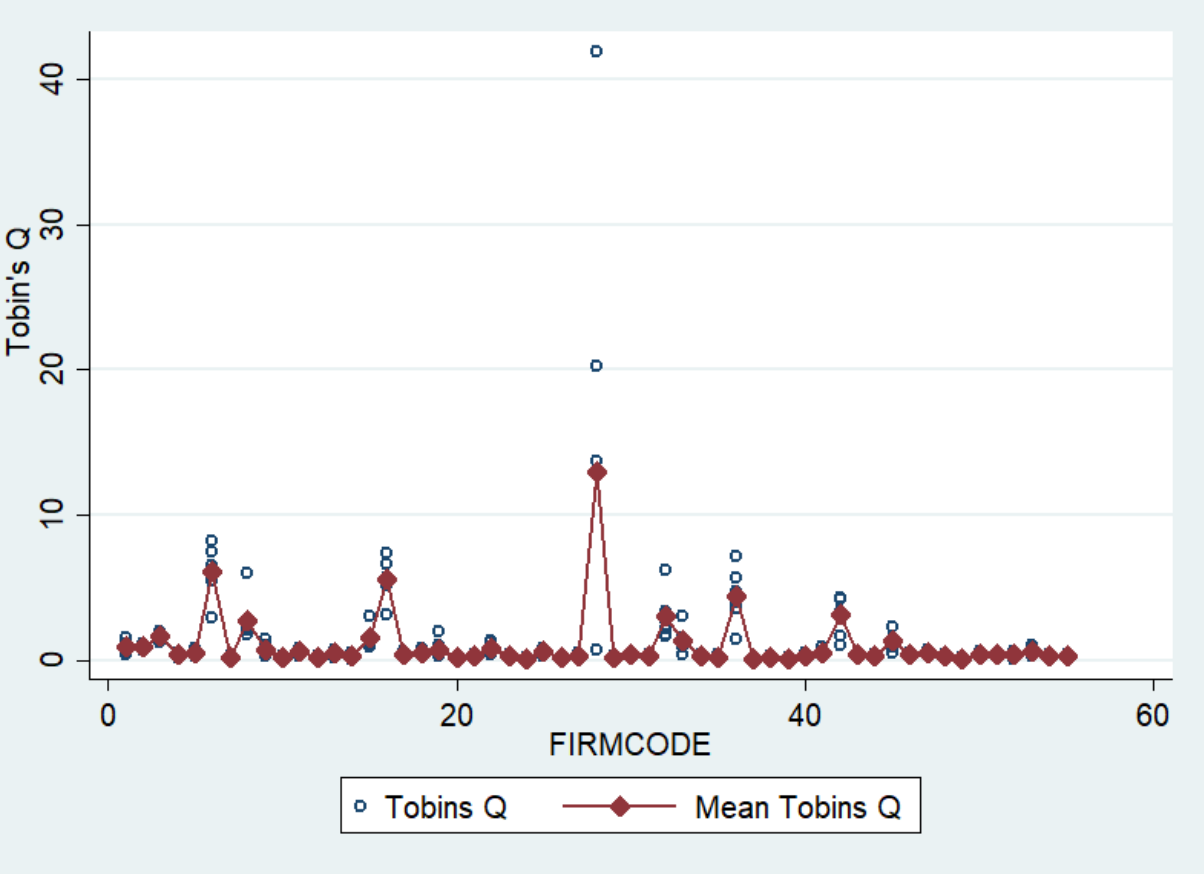

Figure 4.1: Scatter Plot for Tobin's Q against Firms

Figure 4.1 above displays a scatter plot of Tobin's Q over the 6-year period. Each year has plots of the actual Tobin's Q for each entity and the mean Tobin's Q for all the entities in the year. The figure shows that in a given year, the firm's values seem to cluster around the means with very little spread upwards. The Tobin's Q values for the years 2014 and 2015 however seem to be more spread than the other years with positive outliers. The mean Tobin's Q for each year is however shown to be virtually constant over the 6 years with just a slight increase in 2014. Table 4.24 below presents the ANOVA tests, to assess whether there is a significant difference in mean Tobin's Q between the years.

Table 4.24

ANOVA Tobin's Q across Entities

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1395.989	53	26.339	4.910	0.000
Within Groups	1447.544	270	5.361		
Total	2843.533	323	8.804		

Table 4.24 above shows a one-way analysis of variance of Tobin's Q between groups of entities. The F-statistic from the ANOVA table was 4.91, with a p-value of 0.000, which is less than 0.05. This shows that considering 5 percent level of significance, the mean in Tobin's Q was significantly different between the firms.

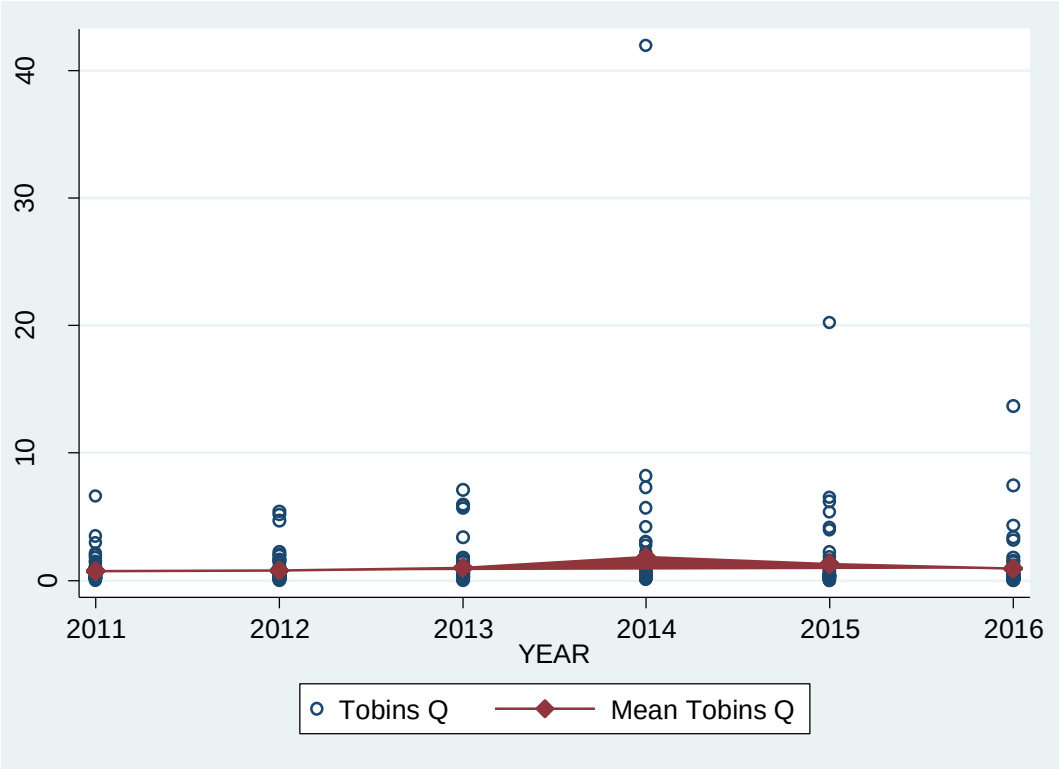

Figure 4.2: Scatter Plot of Tobin's Q across Time

Figure 4.2 above displays a scatter plot of Tobin's Q over the 6-year period. Each year has plots of the actual Tobin's Q for each entity and the mean Tobin's Q for all the entities in the year. The figure shows that in a given year, the firm's values seem to cluster around the means with very little spread upwards. The mean Tobin's Q between the firms also seems to

be constantly equal to the low values over the 6 years. Table 4.25 below presents the ANOVA tests, to assess whether there is a significant difference in mean Tobin's Q between the years.

Table 4.25

ANOVA Tobin's Q across Time

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	47.035	5	9.407	1.07	0.377
Within Groups	2796.498	318	8.794		
Total	2843.533	323	8.804		

Table 4.25 shows a one-way Analysis of variance of Tobin's Q between years. The F-statistic from the ANOVA table is 1.07 with a p-value of 0.377 which is greater than 0.05. This shows that considering a 5 percent level of significance, the mean in Tobin's Q is not significantly different between the years.

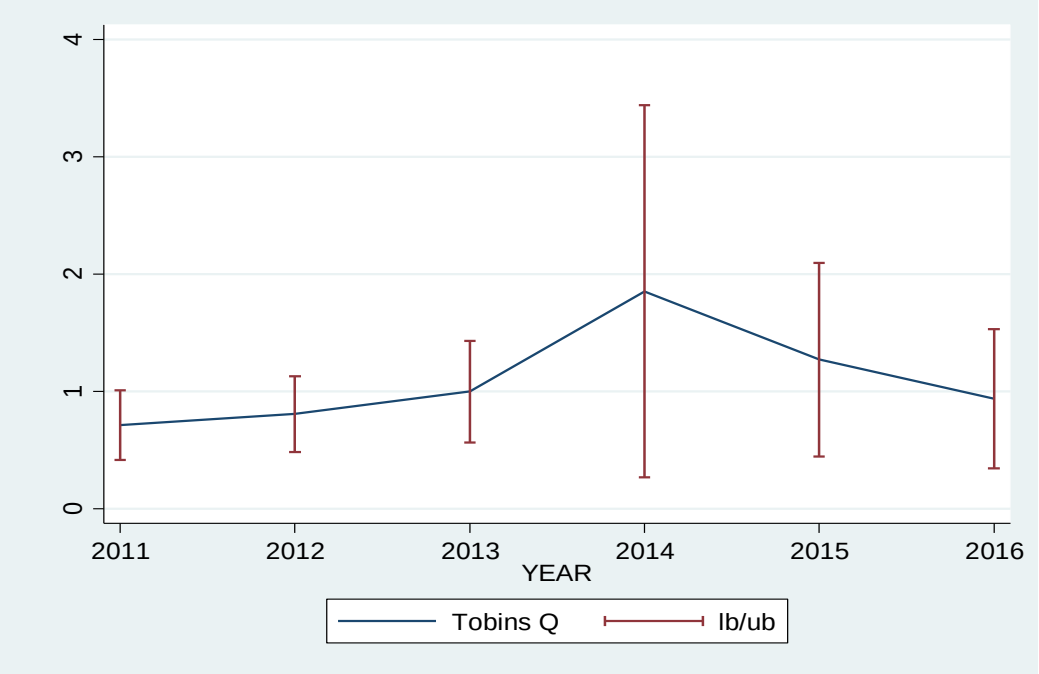

Figure 4.3: The Confidence Intervals (CI) Plot

Figure 4.3 above presents the CI plot, showing graphical analysis of the distribution of Tobin's Q over time, using the mean plots. The confidence intervals show that the indicators probably exhibit heteroscedasticity. Homoscedasticity of a variable implies constant variance. The confidence intervals over the periods are varying, with some years showing shorter CI

than others, implying varying standard deviations over time, which are not homoscedastic but rather heteroscedastic.

The Locally Weighted Scatterplot Smoothing (LOWESS) curve is a smoothened curve used for trend analysis. It creates a smooth curve through a time plot, which assists in understanding the relationship between variables and helps foresee future trends.

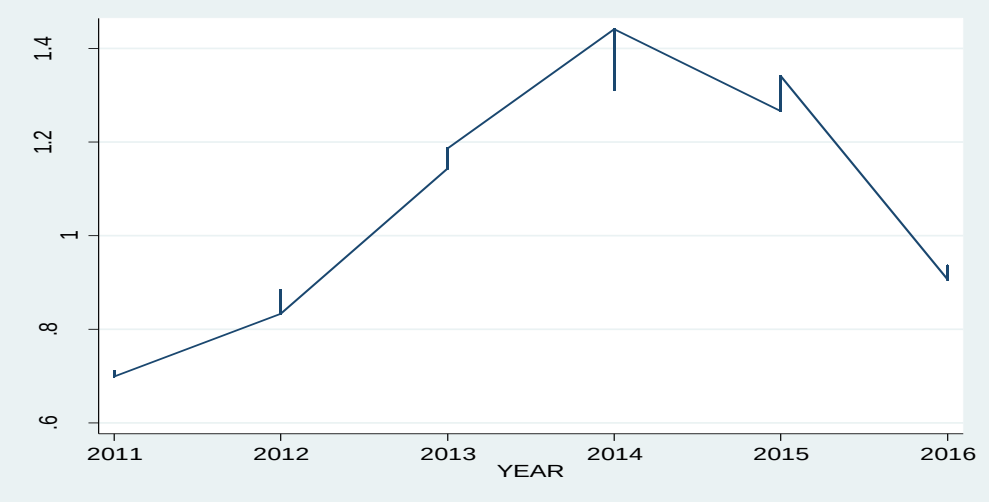

Figure 4.4: Lowess Smooth Curve

Figure 4.4 above shows a virtual increasing trend in the Tobin's Q from 2011 with a decrease from 2014 onwards. This implies that overall, the Tobin's Q had fluctuations for all firms.

4.4 Overall Associations and Correlation Analysis

Before testing the hypothesis, the study assessed the overall associations and correlation between the dependent and the predictor variables. The relationship between the dependent and independent variables was analyzed using the equality of means test, while the relationship between the mediating and moderation variables was assessed using the Pearson product moment correlation coefficient.

4.4.1 Foreign Exchange Risk Hedging and Financial Performance

To assess the association between hedging and financial performance, the equality of means test was used, since the dependent variable was measured continuously while the independent was measured on a categorical scale. All the measures of associations used considered the dataset as an entire cross-sectional data without considering the longitudinal aspect.

Table 4.26
Equality of Mean Test between Financial Hedging and Financial Performance

Variable		Obs	Mean	Std. Err.	Std. Dev.	[95%Conf.	Interval]
No Financial hedging		246	1.144	0.211	3.308	0.728	1.559
Financial Hedging practiced		78	0.943	0.163	1.441	0.618	1.268
	Combined	324	1.095	0.165	2.967	0.771	1.420
	diff		0.201	0.386		-0.559	0.960

Note. diff = mean (0) - mean (1) = 0.5197
Ho: diff = 0 df = 322
Ha: diff != 0 Pr(|T| > |t|) = 0.6037

The equality of mean test is used to assess whether the mean of a variable is equal between two populations or groups of a population. The data was divided into two groups (population sub-sets). A value of 0 was assigned where hedging is not practiced and 1 for entities that reported use of financial hedging. The test sought to determine whether the two groups had equal performance in terms of equal mean Tobin's Q in the two groups. From table 4.26 above, the mean performance (Tobin's Q) are unequal (group 0=1.144, group 1= 0.943) with difference in mean Tobin's Q of 0.201. This implies that firms that do not practice financial hedging have a better performance (larger mean Tobin's Q). A t-test for equality of means is used to test whether two levels of performance is significantly different. This equality of means test is a test of the null hypothesis that the difference in mean Tobin's Q in the 2 groups is equal to zero. The results showed that the p-value of the t-statistic was 0.603, which is greater than 0.05 hence the null hypothesis could not be rejected. This means that the difference is significantly equal to 0, thus the Tobin's Q is not significantly different between firms that practiced financial hedging and those that did not. This further implies that there is no significant association financial Hedging and Tobin's Q.

Table 4.27

Equality of Mean Test between Natural Hedging and Financial Performance

	Group	Obs	Mean	Std. Err.	Std. Dev.	[95%Conf.Interval]	
No Natural hedging	0	168	1.368	0.295	3.826	0.786	1.951
Natural Hedging practiced	1	156	0.801	0.124	1.552	0.556	1.047
	combined	324	1.095	0.165	2.967	0.771	1.420
	diff		0.567	0.329		-0.080	1.214

Note: diff = mean (0) - mean (1) t= 1.7249
Ho: diff = 0 df = 322
Ha: diff != 0
Pr(|T| > |t|) = 0.0855

Table 4.27 above shows the association test between Natural hedging and Tobin's Q. The t-test gave a p-value of 0.0855 which is greater than 0.05 hence implying that the Tobin's Q is not significantly different between the firms that practiced natural hedging and those that did not. This further implies that there is no significant association between natural hedging and Tobin's Q.

Table 4.28

Currency Hedging Techniques and Financial Performance

Variable	Group	Obs	Mean	Std. Err.	Std. Dev.	[95%Conf.Interval]	
No hedging	0	108	1.495	0.445	4.627	0.612	2.377
Hedging practiced	1	216	0.896	0.107	1.566	0.686	1.106
	combined	324	1.095	0.165	2.967	0.771	1.420
	diff		0.599	0.349		-0.087	1.285

Note: diff = mean (0) - mean (1) = 1.7188
Ho: diff = 0 df = 322
Ha: diff != 0 Pr(|T| > |t|) = 0.0866

Table 4.28 above, shows the association test between the overall hedging and Tobin's Q. The t-test gave a p-value of 0.0866 which is greater than 0.05 hence implying that the Tobin's Q is not significantly different between the two categories of organizations that practiced

currency hedging and those that did not. This further implies that there is no significant association between currency hedging and Tobin's Q.

4.4.2 Firm Specific Factors, Corporate Governance and Financial Performance

The correlation matrix in Table 4.29 below presents the results of the relationships between the indicators of firm specific factors, corporate governance and financial performance (Tobin's Q). The items included in the correlation matrix were all measured on a continuous scale thus the Pearson product moment correlation coefficient was used. The correlation coefficients were calculated based on the data as a cross-sectional dataset without considering the panel effects.

Table 4.29

The Correlation Matrix

		TQ	**Size**	**Age**	**Inv opp**	**Liquidity**	**Geo div**	**B-size**	**B-ind**	**Ind-prop**
TQ		1								
Size	$rho(\rho)$	-0.285	1							
	Sig.	0.000								
Age	$rho(\rho)$	0.195	-0.386	1						
	Sig.	0.000	0.000							
Inv opp	rho(ρ)	-0.063	0.014	-0.053	1					
	Sig.	0.263	0.802	0.347						
Liquidity	$rho(\rho)$	0.072	-0.281	0.158	-0.056	1				
	Sig.	0.196	0.000	0.005	0.313					
Geo div	rho(ρ)	-0.030	-0.053	0.100	-0.035	-0.007	1			
	Sig.	0.595	0.344	0.074	0.529	0.904				
B-size	$Rho(\rho)$	-0.030	0.556	-0.216	0.065	-0.297	-0.026	1		
	Sig.	0.587	0.000	0.000	0.245	0.000	0.647			
B-ind	rho(ρ)	-0.070	0.466	-0.217	0.132	-0.194	-0.045	0.748	1	
	Sig.	0.209	0.000	0.000	0.018	0.001	0.417	0.000		
Ind-prop	rho (ρ)	-0.013	0.044	-0.058	0.111	0.111	-0.037	-0.015	0.633	1
	Sig.	0.821	0.427	0.300	0.047	0.046	0.505	0.792	0.000	

Note: TQ= Tobin's Q, INV OPP= Investment Opportunity, Geo Div=geographical diversification, B-size= Board Size, B-ind= Board Independence, Ind-prop=proportion of independent directors

The results show that majority of the constructs do not have a significant relationship with Tobin's Q. The relationship between Tobin's Q and size was found to be negative but significant ($\rho = -0.285$, p-value=0.000<0.05). This shows a slight negative correlation, which is significant as indicated by the p-value of less than 0.05. Contrary to common wisdom, the size of a firm rate may be inversely related to its investment opportunities and by extension its profitability (Gala & Julio, 2016). Age also has a significant relationship with Tobin's Q ($\rho = 0.195$, p-value=0.000<0.05). The correlation coefficient shows a slight positive relationship, which is significant as shown by the p-value, which is less than 0.05. According to Driffield, Mahambre, and Pal (2007) older firms may be less open to new technology. However, they may be more effective due to managerial supremacy, enhancing financial performance. The other items in the matrix show no significant relationships with Tobin's Q. All the correlation coefficients are very low with p-values greater than 0.05.

4.5 Model Specification and Regression Diagnostic Tests

To test hypotheses and draw conclusions on study objectives, statistical models were fitted for the panel dataset. This study sought to investigate the effect of foreign exchange risk hedging techniques, firm specific factors, and corporate governance on financial performance of listed firms in Kenya.

4.5.1 Panel Unit Root Test

The Levin-Lin-Chu (LLC) and Augmented Dickey-Fuller (ADF) tests were used to determine data stationarity. Two hypothesis were tested, the null and alternate. The null hypothesis for the LLC was; panel data has unit root, and the alternate was; panel data has no unit root. The null hypothesis for the ADF test was; variable is not stationary and the alternate was; variable is stationary. If the p value was greater than 5 percent, the null hypothesis was rejected, for the two tests. Table 4.30 below presents the results of the unit root tests.

Table 4.30
Results of the Unit Root Test

Ho: Panels contain unit roots	Number of panels = 54
Ha: Panels are stationary	Number of periods = 6
AR parameter: Common	Asymptotics: N/T -> 0
Panel means: Included	
Time trend: Not included	
ADF regressions: 1 lag	
LR variance: Bartlett kernel, 5.00 lags average (chosen by LLC)	

	Statistic	p-value
Unadjusted t	-95.4679	
Adjusted t*	-1.00E+02	0.000

4.5.2 Pooled OLS Regression Model

Estimation of panel data models was approached by first assuming the simplest form of the model, the pooled model (Greene, 2010). The pooled model is a population averaged data model that assumes no panel effect, following the assumption that any latent heterogeneity has been averaged out. Latent heterogeneity are individual effects for each entity that are specific variables for each individual (entity) that are taken to be constant over the period of the panel data. The pooled model effect occurs when there is a time series of cross sections but the observations in each cross section do not necessarily refer to the same unit. The same model applies in each time period. Pooled OLS assumes homoskedasticity and no relationship between each entity's observations over time and between different units in the same time period. The study therefore first explored the possibility of fitting a significant pooled OLS model. The pooled OLS model also assumes a uniform error variance. The possible pooled model results are shown in table 4.31.

Table 4.31
The Pooled Model

		Number of obs	=	**324**
		F(3, 3568)	=	2.27
		Prob > F	=	0.1051
		R-squared	=	0.0139
		Adj R-squared	=	0.0078
	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
Financial hedging	-0.516	0.413	-1.250	0.213
Natural hedging	-0.730	0.354	-2.070	0.040
_Cons	1.571	0.280	5.610	0.000

Table 4.31 above shows the possible pooled OLS model ignoring the panel effects of the data. The results show that the R-square is 0.0139 implying 1.39% of the variation in financial performance as explained by the variations of the natural and financial hedging. The p-value of the ANOVA F-statistic was 0.105, which is greater than 0.05, implying that the model was generally insignificant.

Table 4.32
Lagrange Multiplier Test - (Breusch-Pagan)

Estimated results:	**Var**	**sd=sqrt(Var)**
Firm value	8.804	2.967
E	5.361	2.315
U	3.539	1.881

Test: Var(u) = 0 $chibar^2(01) = 117.26$ $Prob > chibar^2 = 0.000$

Based on the preposition by Torres (2007), a decision as to either use the random effect regression or the pooled OLS model regression is made using the Breusch-Pagan Lagrange multiplier (LM) test. The test's null hypothesis states that there is no panel effect and alternate states that there is panel effect. Table 4.32 shows the results of the Breusch Pagan LM test, which gives a p value of 0.000, which is less than 0.05. The null hypothesis was therefore rejected and the alternative hypothesis accepted. This indicated that there was a panel effect. In other words, there is a significant difference in the random effect model and the pooled model. Based on Breusch Pagan LM test, pooled effects model was not

appropriate, therefore the study had to choose between random or fixed effects model using Hausman test.

4.5.3 Hausman Test

The study used Hausman test to choose between the fixed and random effect models. According to Hajivassiliou (2011), pooled models, unlike panel effect models, have individual effects that are not persistent over time thus are averaged out. The random effect models on the other hand assume that the individual effects are persistent but are uncorrelated to the predictor variables and are thus ignorable. Hajivassiliou (2011) further points that in fixed effect models, the heterogeneity (individual effects) are both persistent over time and correlated with the predictor variables (independent variables X_i), thus cannot be ignored. The individual effect for each entity must be determined as fixed effects for each particular entity.

Assuming a random effect while the data exhibits non-ignorable persistent heterogeneity would yield inconsistent model estimates under the random effect models. The Hausman specification test was therefore used to determine the appropriate and more viable model between the random effect and the fixed effect. The test is based on testing orthogonally of the common effects and the regressors. The test's null hypothesis stated that random effect model is appropriate, while the alternate hypothesis stated that fixed effect model is appropriate. The Hausman test required computation of the beta coefficients of both the fixed effect (b) and of the random effect (B). Then determine the differences and a covariance matrix of the difference vector.

Table 4.33

Results of Hausman Test

	(b) fixed	**(B) random**	**(b-B) Difference**	**sqrt(diag(V_b-V_B)) S.E.**
Financial hedging	-0.048	-0.516	0.467	1.126
Natural hedging	0.535	-0.730	1.265	1.186

Note: $Chi^2(2) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B) = 1.18$, $Prob>chi^2 = 0.5548$

A Chi-square Wald statistic was computed and used as the rejection criteria for the Hausmann model specification test. The table 4.33 footer shows that the Wald Chi-square statistic was 1.18 with a p-value of 0.5548. The p-value of the Chi-square statistic was greater

than 0.05, hence the criteria failed to reject null hypothesis. Therefore, the results confirmed that the random effect model was the appropriate model.

4.5.4 Random Effect Model

Following the Hausman test results, the random effects model was fitted. The random effect model assumes that the individual effects from the panel data are persistent but are uncorrelated to the predictor variables and can be ignored. Since the unobserved individual effects are assumed to be uncorrelated with the independent variables, formulation of the random effect model can be expressed by the equation:

$$Y_{it} = \beta X'_{it} + (\alpha + \mu_{it}) + \varepsilon_{it} \quad \text{.....(4.1)}$$

The underlying assumption in the random effects model is that the individual heterogeneity being uncorrelated to the included model predictors may be included in the disturbance of the model. As shown in the equation, the term μ_{it} represents the group specific error term due to each individual effect. The other parameters in the equation are: α the single constant term which is the mean of all unobserved individual effects; β is the coeficients of the regressors X_{it}; and ε_{it} is the overall disturbance term.

Table 4.34 below shows the results of the random effect model. The variation of the dependent variable, financial performance, was explained by variations of the model predictors, R squared.

Table 4.34
Results of Random Effect Model

R-sq:	Within	=	0.001	Number of Obs		=	324
	Between	=	0.028	Number of groups		=	54
	Overall	=	0.0139				
Wald	chi2(2)	=	6.271	Obs per group:	Min	=	6
	Prob > chi^2	=	0.043		Avg	=	6
	corr(u_i,X)	=	0.000		Max	=	6

	Estimate	**Std. Error**	**Z value**	**Pr(>|z|)**
Financial hedging	-0.516	0.721	-0.720	0.475
Natural hedging	-0.730	0.365	-1.998	0.046
_Cons	1.571	0.488	3.220	0.001
sigma_u	1.881			
sigma_e	2.315			
Rho	0.397			

From table 4.34, the R squared statistic included the between, within and overall values of 0.028, 0.001 and 0.014 respectively. The R squared "between" groups is less than the others, which implies that a greater amount of information is exploited with between entities. The chi-square statistic of 6.271 has a p-value of 0.043, which is less than 0.05 implying a general significance of the model. The p-value of the z critical ratio statistic for the coefficient of natural hedging is 0.046 implying significance of the estimate. Therefore, the results indicate that natural hedging has a significant effect on financial performance.

In table 4.34, the statistics sigma_u and sigma_e are panel level residual standard deviation and the standard deviation for the overall remainder error components respectively. Sigma_e represents the variation of the overall residuals, which are caused by other factors that are not included in the model. The sigma_u represents variation of the residuals due to other firm specific factors that are not included in the regression model. The statistics are found to be 1.881 for sigma_u and 2.315 for sigma_e. Rho which 0.397 is the fraction of the variance due to the random component u_i. The statistic corr (u_i,X) is the correlation coefficient of the individual effects and the predictors. The random effects model assumes no relationship between the individual effects and the predictors thus the correlation coefficient is 0.000.

To adopt the random effect model as specified by the Hausman test, classical model assumptions diagnostics tests of non-serial correlation, homoskedasticity, correctional independence and normality of the disturbance terms were done. The table 4.35 below presents the summary of the model assumptions diagnostics tests done.

Table 4.35

Summary of Regression Assumptions Diagnostics Tests

Test	Assumption/ Purpose	Test statistic	P-value	Conclusion
Breusch-Godfrey/Wooldridge	Non-Serial correlation	F (1, 53)	0.009	Assumption violated
Lagrange Multiplier (LM)	Homoscedasticity	$Chi^2(53) = 1660000$	0.000	Assumption violated
Likelihood Ratio (LR)	Homoscedasticity	$Chi^2(53) = 821.0171$	0.000	Assumption violated
Wald	Homoscedasticity	$Chi^2(53) = 296000000$	0.000	Assumption violated
Bera-Jarque (JB)	Normality on e	$chi^2(2) = 8.05$	0.017	Assumption violated
Bera-Jarque (JB)	Normality on u	$chi^2(2) = 3883.84$	0.045	Assumption violated
Pesaran Friedman test	Cross-sectional dependence	Pesaran's Z =19.157	0.000	Assumption violated

4.5.5 Test Serial Correlation

When fitting panel data regression models, an assumption was made on the disturbance error term, that the error term does not exhibit serial correlation. Serial correlation of the error term in linear panel-data models causes a bias on the estimated standard errors resulting into less efficient estimates (Drukker, 2003). Wooldridge (2013) developed Wooldridge test for serial correlation, which is considered to be more robust compared to other tests. The Wooldridge test involves determining a Wooldridge F-statistic, which is used as the criteria for concluding on the existence of serial correlation. The null hypothesis for the test stated that there is no first order auto-correlation and the alternate hypothesis stated that there is first order correlation. If the p-value of the F-statistic was less than 0.05, the null hypothesis is rejected, implying the existence of serial correlation of order one. Condition for non-serial correlation is violated. Table 4.35 above presents the results for serial correlation. The p value of the F-statistics was 0.0089, which is less than 0.05, indicating the presence of serial correlation. The assumption of non-serial correlation was violated.

4.5.6 Test for Heteroscedasticity

Panel data model estimation also assumes panel homoscedasticity of the error variances (Hsiao, 2003). This means that the error terms of the model fitted for the panel data do not exhibit heteroscedasticity, also referred to as group-wise heteroscedasticity. Various tests have been derived including the Lagrange Multiplier (LM) test, the Likelihood Ratio (LR) and the Wald test. These tests determine a test statistic that follows a chi-square distribution, to test existence of significant heteroscedastic error variances. The group-wise heteroscedasticity test null hypothesis was: there is no heteroscedasticity, while the alternate hypothesis was: there is heteroscedasticity. In table 4.35 above, the p-values of the LM test, LR test, Wald statistic were 0.000, which is less than 0.05, implying presence of heteroscedasticity. This shows that the fitted random effect model violates the assumption of group-wise homoscedastic variances of the disturbance term. The presence of Heteroscedastic errors renders Ordinary Least Squares (OLS) estimators inefficient and induces bias in the corresponding standard errors (Miller & Startz, 2018).

4.5.7 Test for Normality

Alejo et al. (2015) suggested that checking for non-normal errors in regression models in general is necessary from both conceptual and methodological points of view. The assumption of normality is essential and deviation can affect the reliability of testing procedures and model estimates. Violation of the assumption demands the use of other

methods. Since, the disturbances in panel data could be due to individual effects u_i and the remainder component disturbance e_i, it is essential that normality is tested for both components of the error term. The test proposed by Galvao et al. (2013) an extension of the classical Bera-Jarque (JB) test was applied. It examines the normality of the error for each component separately. The classical JB test is based on the fact that the skewness of a normally distributed variable is 0 with a kurtosis of 3. Table 4.35 above presents the results of the normality test on the error components. The JB chi-square statistics for the e and u components had p-values of 0.017 and 0.0454 respectively. Both are less than 0.05, implying that the error components are not normally distributed thus the normality assumption was violated.

4.5.8 Test for Cross Sectional Dependence

Another assumption when estimating panel data models is that of cross-sectional independence, which assumes that cross-sectional observations are not correlated. According to Greene (2010), it is quite likely that the more important issue for appropriate estimation of the asymptotic covariance matrix is the correlation across observations, not heteroscedasticity. This means that cross sectional independence is a necessary condition for the panel data model. The Pesaran Friedman test for cross-sectional dependence in random effect models was carried out and the results presented in table 4.35 above. The p-value of the Z statistic is 0.000, which is less than 0.05, implying the presence of cross-sectional correlation or dependence of the residuals. The assumption of cross sectional independence was violated.

In summary, the Hausman tests results confirmed that the random effect model was the appropriate model. To adopt the random effect model, the classical model assumptions diagnostics tests of non-serial correlation, homoscedasticity, correctional independence and normality of the disturbance terms were done. All the assumptions were violated; therefore the study applied the Feasible Generalized Least Squares (FGSL) model to test the hypotheses. The FGLS model allows for auto correlated errors, heteroscedastic errors, cross-sectional dependence and non-normality of the error terms components.

4.6 Test of Hypotheses

This section presents the results of test of hypotheses using the Feasible Generalized Least Squares (FGSL) model. The section also presents statistical analysis, interpretations and discussions of the results.

4.6.1 Results of Objective One: Foreign Exchange Risk Hedging Techniques and Financial Performance

The first objective of the study was to determine the effect of foreign exchange risk hedging techniques on financial performance of listed firms in Kenya. The corresponding null hypothesis (H_{01}) was; there is no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya. Currency risk hedging was decomposed into financial hedging and natural hedging. Foreign exchange hedging components were regressed on financial performance using the FGLS model that allowed for heteroscedastic errors and cross-sectional correlations. The model had an autocorrelation bias correction of order 1 with a coefficient 0.8788 and also adopted bootstrapping due to normality assumption violation. The regression results are shown in table 4.36 below.

Table 4.36

Regression Results for Financial and Natural Hedging on Financial Performance

Coefficients: generalized least squares				
Panels: heteroskedastic with cross-sectional correlation				
Correlation: common AR(1) coefficient for all panels (0.8788)				
Estimated covariances	= 1485	Number of Obs	=	324
Estimated autocorrelations	= 1	Number of groups	=	54
Estimated coefficients	= 2	Time periods:	=	6
		Wald $chi^2(2)$	=	6.19
		Prob > chi^2	=	0.045
	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Financial hedging	0.589	1.585	0.370	0.710
Natural hedging	2.173	1.025	2.120	0.034
_Cons	2.755	1.600	1.722	0.085

The results presented in Table 4.36 above show that the model is generally significant with a Wald chi-square statistic (χ^2= 6.19, p-value < 0.05). The model also shows that natural hedging had a significant influence on financial performance (β=2.173, Z= 2.120, p-value < 0.05). The significance was implied by the z-statistic that had a p-value that is less than 0.05. Financial hedging on the other hand was found to have a coefficient (β=0.589, Z= 0.370, p-value > 0.05). The p-value of the z-statistic was greater than 0.05 implying insignificance of the coefficient. Primary data indicated that majority of firms do not use the various types of financial hedging, hence the insignificant effect. The constant term of the model fitted was

insignificant implying that the function of currency risk hedging on performance passed through the origin. The constant term was suppressed in the consequent models.

To ensure the robustness of the results, a second regression model was fitted. It considered foreign exchange risk hedging as a combination of both financial and natural hedging techniques, since having all the three in one model would violate the assumption of non-multi-collinearity. The foreign exchange risk hedging techniques is a function of both financial hedging and natural hedging. In this regression model, currency hedging was considered as a single binary variable, which took 1 for any entity that practiced any kind of hedging and 0 for an entity that did not practice hedging. The model adopted the FGLS approach following the tests that revealed that the random effect model specified for the data violated the assumptions required. The model allowed for heteroscedastic errors. Cross-sectional correlations had an autocorrelation bias correction of order 1 with a coefficient 0.8947 and also adopted bootstrapping due to normality assumption violation. Table 4.37 below presents the results.

Table 4.37

Regression Results Foreign Exchange Risk Hedging Techniques on Financial Performance

Coefficients: generalized least squares				
Panels: heteroskedastic with cross-sectional correlation				
Correlation: common AR(1) coefficient for all panels (0.8947)				
Estimated covariances	= 1485	Number of Obs		= 324
Estimated autocorrelations	= 1	Number of groups		= 54
Estimated coefficients	= 1	Time periods:		= 6
		Wald $chi^2(1)$		= 7.120
		Prob > chi^2		= 0.008
	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Currency risk hedging	3.596	1.595	2.250	0.024
_Cons	1.192	1.437	0.830	0.407

The results in table 4.37, above shows the model Wald statistic (χ^2= 7.120, p-value < 0.05). The p-value was less than 0.05, implying a significant correlation. The model further shows that currency hedging influences financial performance (β =3.596 *Z*= 2.250, p-value < 0.05). The p-value is less than 0.05 implying significance of the coefficient estimate. The estimated model formulated in an equation takes the form:

$$Y_{it} = 3.596X_{it} + \mu_{it} + \varepsilon_{it} \quad (4.2)$$

The null hypothesis was rejected and a conclusion drawn that foreign exchange risk hedging has a significant effect on financial performance of listed firms in Kenya.

4.6.2 Discussion of the Results of Objective One: Foreign Exchange Risk Hedging Techniques and Financial Performance

The first objective was to determine effect of foreign exchange risk hedging techniques on the financial performance. The corresponding null hypothesis (H_{01}) stated that there was no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya. The findings revealed a positive generalized linear relationship between foreign exchange risk hedging techniques and financial performance (Tobin's Q). The model yielded a coefficient estimate of 3.596 implying that an entity practicing any form of foreign exchange risk hedging techniques whether financial or natural hedging is expected to have a Tobin's Q of 3.596 or more, unlike those that do not practice any form of hedging. Firms with Tobin's Q greater than one have better investment opportunities, higher growth potential and an indication that management have utilized the assets under their command in an efficient way, hence improving financial performance (Wolfe & Sauaia, 2003).

The findings are consistent with the theoretical proposition that hedging improves the financial performance of a firm. Bartram et al. (2004) found evidence that the use of general derivatives has a positive effect on the value of the firm. The results were also consistent with findings that natural (operational) hedging techniques increase profits and reasonably reduce the downside foreign exchange risk (Dong, Kouvelis & Su, 2014). Hedging reduces the various costs involved with highly volatile cash flows. It also reduces the problem of under investment which, increases growth investments, which ultimately increases financial performance.

4.6.3 Results of Objective Two: Currency Risk Hedging Techniques, Firm Specific Factors and Financial Performance

The second objective of the study was to establish the mediating effect of firm specific factors on the relationship between foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. The null hypothesis (H_{02}) stated that there is no

mediating effect of firm specific factors on the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

Mediation is a hypothesized causal chain in which one variable affects a second variable that, in turn, affects a third variable. The intervening variable, M, is the mediator. In this study, the mediator was firm specific factors. It "mediates" the relationship between a predictor, X (currency hedging), and the outcome (Tobin's Q). According to Baron and Kenny (1986) three conditions are necessary for mediation to occur. First, there must be a relationship between X and M. Second, M must be significantly related to Y. Lastly, the strength of the relationship between X and Y diminishes when M is introduced in the model. Considering direct effects a and b, the mediational effects in which X leads to Y through M can be illustrated in figure 4.5 as follows;

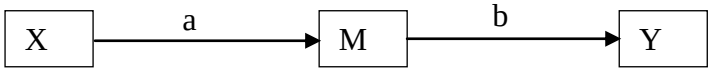

Figure 4.5: The Mediation Effect of Firm Size

The Mediator (M) had various dimensions which were tested and size (logarithm of total assets) retained as the significant mediating variable based on the stepwise modelling and tests, considering the different dimensions of firm specific factors. The other dimensions were dropped due to either insignificant influence on performance or insignificant causal relationship with currency hedging (X). The various models fitted with other dimensions of M are shown in appendix III.

The study borrowed from the Baron and Kenny (1986) method of testing mediation, which applies a four-step approach to examine the significance of the coefficient in each stage. The first three steps are aimed at establishing the existence of zero-order relationships among the variables. In the event that one or more of the relationships in steps 1 to 3 are insignificant, researchers usually conclude on implausibility of mediation (MacKinnon, Fairchild, & Fritz, 2007). In step one, a simple regression analysis was conducted to explore the effect of foreign exchange hedging (X) on financial performance (Y). As shown in table 4.37 above, foreign exchange risk hedging had significant effect on financial performance.

Steps 2 and 3 involved introduction of the mediator (M) as a dependent variable influenced by foreign currency risk hedging (X) as the independent variable, then influencing financial

performance (Y). Regressing the latent construct obtained from factor analysis as the mediator yielded an insignificant causal relationship with currency hedging. This latent construct (M) considered age and size as observed indicators. The table in appendix III-2 shows that currency hedging does not have significant influence on the latent construct as required. The latent construct from age and size was dropped from further mediation analysis having failed to meet the significance in step 2. This latent construct was however seen to significantly influence performance (Tobin's Q) as shown in the model in appendix III-1. Considering the individual observed firm specific factors dimensions as mediators, the variables age, size, and board independence were found to have significant influence on performance (Tobin's Q) and thus being candidates of mediation. As shown in appendix III-3.

Of the three dimensions retained, age and board independence were found not to be significantly influenced by currency hedging as required in step 2 of the mediation analysis leaving size for further mediation analysis. This is shown in appendices III-4 and III-5 respectively. Step two involved running a regression model to explore X predicting M, that is, the effect of currency hedging on firm specific factors. A regression model was therefore fitted as shown in table 4.38 below, to estimate the coefficient of Forex hedging on predicting firm specific factors. The model had auto-regression bias correction coefficient due to the fact that autocorrelation of order 1 for the model was 0.9443.

Table 4.38

Effect of Foreign Risk Hedging Techniques on Firm Specific Factors

Coefficients: generalized least squares				
Panels: heteroskedastic with cross-sectional correlation				
Correlation: common AR(1) coefficient for all panels (-0.9443)				
Estimated covariances	= 1485	Number of Obs		= 324
Estimated autocorrelations	= 1	Number of groups		= 54
Estimated coefficients	= 1	Time periods:		= 6
		Wald $chi^2(3)$		= 1789.32
		Prob > chi^2		= 0.000
	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Currency risk hedging	24.191	0.572	42.300	0.000

The results in table 4.38 above show that size was significantly predicted by currency risk hedging (β =24.191, Z= 42.300, p-value < 0.05). The p-value was less than 0.05 implying significance of the coefficient estimate. An insignificant coefficient estimate of forex hedging on the mediator would give no grounds for a mediation effect. The results however show existence of a zero-order relationship between the mediator and the independent variable. The estimated model formulated in the equation took the form:

$$M_{it} = 24.191X_{it} + \mu_{it} + \varepsilon_{it} \quad \text{.....(4.3)}$$

The third step of testing mediation was to test the effect of firm specific factors on financial performance. The results are presented in table 4.39 below.

Table 4.39

Effect of Firm Specific Factors on Financial Performance

Coefficients: generalized least squares			
Panels: heteroskedastic with cross-sectional correlation			
Correlation: common AR(1) coefficient for all panels (0.8741)			
Estimated covariances = 1485	Number of Obs	= 324	
Estimated autocorrelations = 1	Number of groups	= 54	
Estimated coefficients = 1	Time periods:	6	
	Wald $chi^2(1)$	= 6.750	
	Prob > chi^2	= 0.009	

	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Firm size	0.189	0.073	2.600	0.009

The results show that size has significant effect on financial performance as shown in table 4.39. The auto-regression bias correction coefficient due to autocorrelation of order 1 for model 3 was 0.8741. The model's Wald statistic (χ^2= 6.750, p-value < 0.05) presents a p-value less than 0.05 suggesting a significant model. The model moreover exhibits that size influences financial performance (β =0.189 Z= 2.600, p-value < 0.05). The p-value of less than 0.05 suggests the significance of the coefficient estimate. The significance of this coefficient confirms that a zero-order relationship exists between the moderator and the dependent variable, giving grounds for a possible mediation effect. An insignificant coefficient estimate of currency hedging on the mediator would give no grounds for a

mediation effect. The estimated model formulated in the equation took the form as shown below:

$$Y_{it} = 0.189M_{it} + \mu_{it} + \varepsilon_{it} \quad \ldots\ldots(4.4)$$

The fourth and final step of testing mediation involved conducting a multiple regression analysis in which both the independent variable (X) and the mediator (M) predict the dependent variable (Y). This regression analysis was aimed at testing the existence of a mediating effect. Mediation is characterized by a diminishing coefficient of the independent variable on the dependent variable in the presence of the mediator. When all the relationships in step 1 to 3 are significant, mediation is explored and concluded to exist, if the effect (coefficient) of the mediator remains significant in step four while the coefficient of the independent variable reduces or becomes insignificant. In the event that the coefficient of the independent variable reduces but remains significant, the effect is said to be partial mediation effect. However, should the independent variable become insignificant in step four, the effect is full mediation effect. The results of the four-step regression model are shown in table 4.40 below.

Table 4.40

Firm Specific Factors and Currency Risk Hedging on Financial Performance

Coefficients: generalized least squares				
Panels: heteroskedastic with cross-sectional correlation				
Correlation: common AR(1) coefficient for all panels (-0.8631)				
Estimated covariances	= 1485	Number of Obs		= 324
Estimated autocorrelations	= 1	Number of groups		= 54
Estimated coefficients	= 1	Time periods:		= 6
		Wald $chi^2(3)$		= 14.39
		Prob > chi^2		= 0.000
	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Size	0.162	0.081	1.990	0.046
Currency risk hedging	0.895	1.439	0.620	0.534

The results from table 4.40 above show that size, the coefficient of the firm specific factors, remains significant (β =0.162, Z= 1.990, p-value < 0.05). The p-value of the coefficient estimate of currency hedging however shows insignificant effect (β =0.895, Z= 0.620, p-value > 0.05). This implies that including the meditator in the model diminishes the influence

of currency hedging on financial performance to an insignificant effect. The study therefore concludes that there is full mediation effect.

The results from the four-step analysis show the existence of a full mediation effect, as displayed in figure 4.7 below. The results revealed that the direct effect (b) remained significant in the multiple regression while the direct effect (c') diminished to an insignificant coefficient on the inclusion of the mediator.

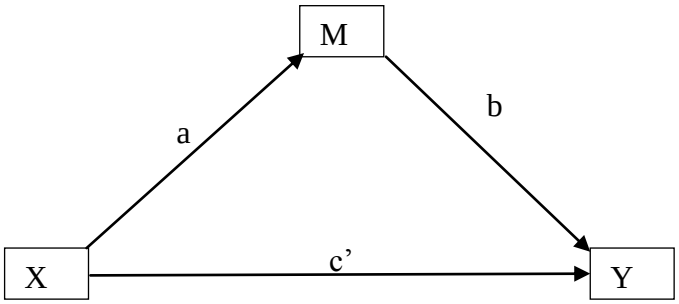

Figure 4.6: Full Mediation Effect of Firm Specific Factors

However, the regression analyses, steps one to four did not test the significance of the indirect mediating effect. The indirect mediating effect was then tested using the bootstrap method following previous studies like (Biesanz, Falk & Savalei, 2010; Fritz, Taylor & MacKinnon, 2012). In this, bias corrected bootstrapped confidence intervals of the indirect effect are explored and expected not to include zero. The results of the bootstrapped indirect effect are presented in table 4.41 below.

Table 4.41

Bootstrapped Indirect Effect

	Observed Estimate	**Bias**	**Bootstrap Std. Err.**	**[95% Conf.**	**Interval]**
Indirect effect	3.919	0.003	0.055	3.811	4.027 (BCa)

Note: (BCa) bias-corrected and accelerated confidence interval

The results of the indirect effect in table 4.41 above show the product estimate indirect effect was 3.811 which had a bootstrapped bias corrected 95% confidence interval of 3.917 to 4.027. This implied that the indirect effect was significant.

4.6.4 Discussion of the Results of Objective Two: Currency Risk Hedging Techniques, Firm Specific Factors and Financial Performance

The second objective was to determine whether there was a mediating effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance. The corresponding hypothesis, (H_{02}) stated that there was no mediating effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance. The findings revealed that firm specific factors mediate the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. Analysis for this objective involved fitting four models to assess the role of firm specific factors on the relationship between foreign exchange risk hedging and firm performance. The assessment was to determine whether the coefficient of foreign exchange risk hedging diminishes on introduction of the mediator. Foreign exchange risk hedging was found to influence performance and was also found to have a direct influence on the mediator. The firm specific factors were also found to influence performance. However, on introducing the mediator into a multiple regression model including hedging and the mediator as predictors, the coefficient of foreign exchange risk hedging was found to be diminished, implying full mediation.

The direct effect of foreign exchange risk hedging on performance is diminished to an insignificant coefficient when included with the mediator while that of the firm specific factor (mediator) remains significant. The indirect effect was estimated to be 3.919 with a standard error of 0.055, which yielded a confidence interval ranging from 3.917 to 4.027. The confidence interval calculated at 95% confidence was entirely positive not including zero, thus the null hypothesis was rejected. The study concluded that there was a mediating effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

The findings are consistent with previous studies on factors influencing hedging. Doidge Griffin and Williamson (2006) found that large firms are exposed to more foreign exchange risk than smaller firms, hence they employ hedging techniques to minimize the risk. Among the dimensions of firm specific factors, only size was found to be a significant mediating variable. The other dimension, age, was found to influence performance but with no mediating influence. Age was not significantly influenced by hedging thus could not be considered as a significant mediator, hence age is a factor that is expected to be independent of the changes in the currency hedging practices of the firm. These results partly corroborate

the finding of Okwo, Ezenwakwelu, Igwe and Imhanrenialena (2019) study which revealed that firm age, employee size, and profit size do not mediate between transaction exposure hedging on firm survival, hence its financial performance. The size of the firm, which was measured as the logarithm of the total assets of the firm was found to be significantly influenced by hedging. When firms minimize risks, this could in turn increase its assets hence the size. Since size was found to be a significant mediator, the increase in size due to minimized risks would then influence the firms' performance. These finding are consistent with previous findings, for example, Okwo et al. (2019) found that hedging greatly influences the firm's size and hence its survival.

4.6.5 Results of Objective Three: Currency Risk Hedging Techniques, Corporate Governance and Financial Performance

The third objective of the study was to establish the moderating effect of corporate governance on the relationship between foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. The null hypothesis (H_{03}) stated that there is no significant moderating effect of corporate governance on the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

The moderating effect is measured continuously and this effect is modelled by generating a new interaction variable (XZ), which is the product of the independent variable (X) and the moderating variable (Z), (Little, Card, Bovaird, Preacher & Crandall, 2007). The interaction term was entered into the stepwise hierarchical regression at the last step after the linear main effects of the moderating (Z) and independent variables (X) on the dependent (Y) were estimated. In this study, a hierarchical regression model was fitted using three steps. At each step the significant change in the model was explored.

The first step, model one, examined the effect of the independent variable, foreign exchange risk hedging techniques on the dependent variable, financial performance. The results are presented in table 4.42 below.

Table 4.42

Regression Results of Foreign Risk Hedging Techniques on Financial Performance

Coefficients: generalized least squares				
Panels: heteroskedastic with cross-sectional correlation				
Correlation: common AR(1) coefficient for all panels (0.8947)				
Estimated covariances	= 1485	Number of Obs		= 324
Estimated autocorrelations	= 1	Number of groups		= 54
Estimated coefficients	= 1	Time periods:		= 6
		Wald $chi^2(1)$		= 7.120
		Prob > chi^2		= 0.008
	Coefficients.	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Currency risk Hedging	3.596	1.595	2.250	0.024
_Cons	1.192	1.437	0.830	0.407

From table 4.42 above, the results show a significant model with Wald statistic (χ^2= 7.120, p-value < 0.05) and p-value 0.045 implying significance of the effect of currency hedging on financial performance.

At the second step, model 2, the moderating variable was introduced to the equation. To test whether there is a significant change from model one to model two with the moderating variable, corporate governance, a likelihood ratio test was carried out. The likelihood ratio test used a chi-square, to test the difference in models. Akaike and Bayesian information criteria (AIC and BIC) were used to determine whether the difference implied an improved model by introducing the moderating variable. The results for the likelihood ratio test are shown in table 4.43 below.

Table 4.43

Likelihood Ratio Test between Model 1 and Model 2

Likelihood-ratio test	LR $chi^2(1)$	=	97.73
(Assumption: Model 1 nested in Model 2)	Prob > chi^2	=	0.000

Akaike's information criterion and Bayesian information criterion

Model	**Obs**	**ll(null)**	**ll(model)**	**Df**	**AIC**	**BIC**
1	324	.	-144.885	55	399.770	607.711
2	324	.	-96.022	56	304.045	515.766

Note: AIC= Akaike's information criterion and BIC= Bayesian information criterion

From table 4.43, both the AIC and the BIC of model two; 304.045 and 515.766 respectively are lower than the AIC and BIC of 399.770 and 607.711 respectively, in model one. This implies that model two is better than model one, indicating there was an improvement. The difference between the two models is also significant as shown by the p-value of the chi-square statistic of 0.000, which is less than 0.05. The results show that there was a significant change in the likelihood ratio statistic. In the third step, the interaction term was introduced to the model. The change in the model upon the introduction of the interaction term was also assessed using likelihood ratio (LR) test. The results are shown in table 4.44 below.

Table 4.44

Likelihood Ratio Test between Model 2 and Model 3

Likelihood-ratio test	LR $chi^2(1)$	=	39.71
(Assumption: Model 2 nested in Model 3)	Prob > chi^2	=	0.000

Akaike's information criterion and Bayesian information criterion

Model	**Obs**	**ll(null)**	**ll(model)**	**df**	**AIC**	**BIC**
2	324	.	-96.022	56	304.045	515.766
3	324	.	-76.168	57	266.335	481.838

Note: AIC= Akaike's information criterion and BIC= Bayesian information criterion

The results in table 4.44 above show that the AIC and BIC of model three is less than that of model two implying an improvement after introduction of the interaction term. Thus, the significance of the improvement was observed from the likelihood ratio chi-square statistic. The change in LR statistic due to the addition is 39.71 and the p-value of the change due to the addition of the interaction terms is 0.000. This implied that the interaction terms significantly changed the LR of the model, indicating that there is a moderating influence of corporate governance on the relationship between foreign exchange risk hedging techniques on financial performance.

Table 4.45

Summary Moderating Effect of Corporate Governance

Coefficients: generalized least squares

Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.1784)

Estimated covariances	= 1485	Number of Obs	= 324
Estimated autocorrelations	= 1	Number of groups	= 54
Estimated coefficients	= 3	Time periods:	= 6
		Wald $chi^2(3)$- Model 3	= 1304.8
		Prob > chi^2 - Model 3	= 0.000

Model	Predictors	Coefficients	Bootstrap Std. Err.	Z	P>/z/
1	Currency risk hedging	0.196	0.008	23.390	0.000
	Currency risk hedging	0.021	0.011	1.986	0.047
2	Corporate governance (Independent non-executive directors)	0.035	0.002	21.260	0.000
	Currency risk hedging	0.102	0.017	5.910	0.000
	Corporate governance (Independent non-executive directors)	0.057	0.002	25.450	0.000
3	Corporate governance interaction currency risk hedging	-0.043	0.003	-12.970	0.000

Table 4.45 above shows the results of the moderated multiple regression model that includes the interaction term. The model fitted is statistically significant as shown by the Wald Chi-square statistic of 1304.8, with a p-value less than 0.05. The coefficient of the interaction variable has a significant influence on financial performance (β =-0.043, Z= -12.970, p-value < 0.05). This confirms that corporate governance had a moderating effect on the relationship between forex risk hedging and performance. The equation generated from the model is given below.

$$Y_{it} = 0.102X_{it} + 0.057Z_{it} - 0.043XZ_{it} + \mu_{it} + \varepsilon_{it} \quad \text{.....(4.5)}$$

To sum it up, from the LR test, the additional change in the change in LR statistic due to the addition was 39.71 and the p-value of the change due to the addition of the interaction terms is 0.000 implying that the interaction terms significantly change the LR of the model. The

critical ratio of the interaction term from the coefficients table is -12.970 with a p-value of 0.000. The p-value is less than 0.05. This implies that there was a moderating effect of corporate governance on the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

4.6.6 Discussion of the Results of Objective Three: Discussion on Currency Risk Hedging Techniques, Corporate Governance and Financial Performance

The third objective was to determine the influence of corporate governance on the relationship between currency hedging techniques and financial performance. The corresponding null hypothesis (H_{03}) stated that there is no moderating effect of corporate governance in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. The LR test indicated that there was a moderating effect of corporate governance on the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.

The results corroborate findings of previous studies. Allayannis, Lel and Miller (2012); Lel (2012) found that the strength of corporate governance influence how firms manage risk. Firms with strong governance structure like a large number of independent non-executive board members and high percentage of outsider block holders encourage the proper use of derivative instruments which results to higher hedging premium, which can be linked to higher financial performance. Large number of independent board members improves the quality of decisions made, which increases the value of the firm (Husaini & Saiful 2017). In contrast, firms with weak governance structures are likely to misuse the derivative instruments, which could have a negative impact on the financial performance (Osuoha et al., 2015). Husaini and Saiful (2017) also found that companies with high percentage of insider ownership, especially managerial ownership, do not use hedging appropriately due to conflicts of interest, which has a negative impact on financial performance.

4.6.7 Results of Objective Four: Joint Effect of Foreign Risk Hedging Techniques, Firm Specific Factors, Corporate Governance and Financial Performance

The joint effect of the independent variable, mediation of firm specific factors and moderation of corporate governance was assessed using a multiple regression model, including all the variables as predictors. It was also possible for moderation and mediation relationships to occur in the same context. There are frequent occurrences of models in which interaction effects are hypothesized to be mediated or indirect effects are hypothesized to be

moderated. In the occurrence of interaction effect, which is mediated, the effect is termed as mediated moderation (Baron & Kenny, 1986). On the other hand, when an indirect effect is moderated by one or more moderator variables, the effect is termed as moderated mediation (Muller, Judd, & Yzerbyt, 2005). This study tested the combined effect using multiple regression and further examined other effects underlying joint effects by exploring the possibilities of a moderated mediation.

Using a multiple regression model: the independent variable, foreign exchange risk hedging (X); the mediating variable, the firm specific factor (M); and the moderating variable, corporate governance (Z) were all regressed together as predictors of financial performance (Y). This model was carried out without exploring the mediation and moderating effects. The results are shown in table 4.46 below.

Table 4.46
Joint Effect of Currency Risk Hedging Techniques, Firm Specific Factors, Corporate Governance and Financial Performance

Coefficients: generalized least squares
Panels: heteroskedastic with cross-sectional correlation
Correlation: common AR(1) coefficient for all panels (0.18584)

Estimated covariances	= 1485	Number of Obs	= 324
Estimated autocorrelations	= 1	Number of groups	= 54
Estimated coefficients	= 3	Time periods:	= 6
		Wald $chi^2(3)$	= 1482.94
		Prob > chi^2	= 0.000

	Coefficients	Bootstrap Std. Err.	Z	P>/z/
Currency risk hedging	-0.156	0.014	-10.890	0.00
Firm specific factor	0.011	0.001	13.82	0.00
Corporate governance	0.011	0.002	4.370	0.00

From table 4.46, the results revealed that the model was generally significant with a chi-square statistic of 1482.94 and a p-value of 0.000. All the three predictors; currency risk hedging, firm specific factors and corporate governance were found to have coefficient estimates that were significant, with all p-values less than 0.05. The results from the model generated the equation below.

$$Y_{it} = -0.156X_{it} + 0.011M_{it} + 0.011Z_{it} + \mu_{it} + \varepsilon_{it} \quad \text{.....(4.6)}$$

4.6.6.1 Evaluating Moderated Mediation

According to Preacher, Rucker, and Hayes (2007) there are five different and specific ways to assess moderation, as follows: (i) b is moderated by the input variable X, (ii) a is moderated by a moderator variable Z but b is not moderated by Z, (iii) b is moderated by Z but a is not moderated by Z, (iv) a is moderated by a moderator variable Z1and b is moderated by another moderator variable Z2., (v) a and b are both moderated by Z.

Considering the fact that this study had only one moderating variable, tests included the possibility of scenarios (ii) and (v) where a single moderator either moderates both paths a and b; or path a only; but not path b. Two models were fitted to explore the moderated mediation effect as shown in table 4.47.

Table 4.47

Moderated Mediation of Corporate Governance, Firm Specific Factors and Currency risk Hedging

	Model 1 (Outcome is M)				**Model 2 (Outcome is Y)**			
	Coef.	**Std. Err.**	**z**	**P>z**	**Coef.**	**Std. Err.**	**Z**	**P>z**
Currency risk hedging (X)	20.802	0.120	173.730	0.00	-0.143	0.051	-2.820	0.005
Firm specific factor (M)					0.008	0.002	4.320	0.000
Corporate governance (Z)	4.291	0.010	420.130	0.00	0.171	0.018	9.270	0.000
XZ	-3.791	0.019	-195.81	0.00	0.014	0.008	1.770	0.076
MZ					-0.007	0.001	-8.650	0.000
Chi-square		741038.76				1515.62		
P-value		0.000				0.000		

According to the results in table 4.47 above, corporate governance moderates both paths. For path "a", which is characterized by regressing forex hedging (X) on M with a moderator, the interaction term between the X and the moderator XZ was found to be significant (β =-3.791, Z= -195.81, p-value < 0.05). This was shown by the model 1 results, which implies that corporate governance moderates the relationship between X and the mediator.

Path "b" is also moderated as shown by the model 2 results, which considered computation of the interaction term between the mediator and the moderator MZ. The model includes the interaction term after allowing for all control variables. The interaction term is also found to

have a significant coefficient (β =-0.007, Z= -8.650, p-value < 0.05). This shows moderation of both paths a and b represented by figure 4.8 below.

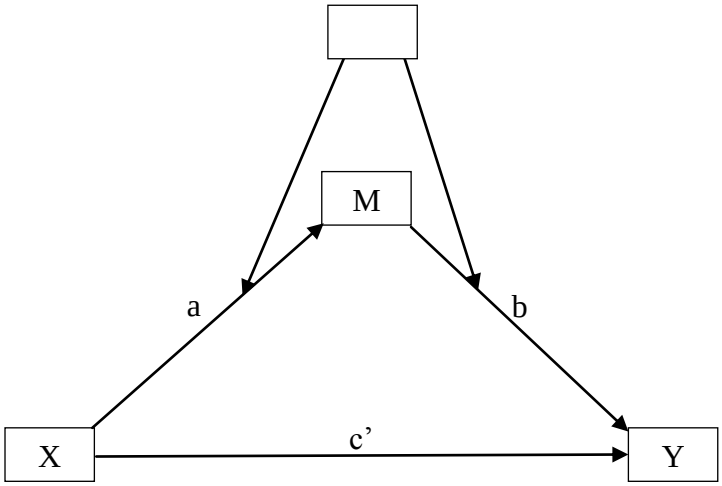

Figure 4.7: Moderated Mediation

The chi-square statistic for the joint multiple regression model and the moderated regression model as shown in tables 4.46 and 4.47, had p-values less than 0.05 implying significant joint effects of the independent variables in the models. The null hypothesis was therefore rejected and a conclusion drawn that there was a significant joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance of listed firms in Kenya.

4.6.8 Discussion of the Results of Objective Four: Discussion on Joint Effect of Foreign Exchange Risk Hedging Techniques, Firm Specific Factors, Corporate Governance and Financial Performance

The fourth objective was to determine the joint influence foreign exchange risk hedging techniques, firm specific factors, and corporate governance on financial performance. The corresponding null hypothesis (H_{04}) stated that there is no significant joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance of listed firms in Kenya. The multiple regression results indicated that all the three independent variables had a significant joint effect on the financial performance of the listed firms. These results agree with what was hypothesized, as the outcome indicates that hedging by large firms with strong corporate governance enhances financial performance. These results corroborate results of other empirical studies.

Chaudhry et al. (2014) found that there is a significant relationship between the use of derivatives, firm size and financial performance. The study also revealed that large firms that use derivatives for hedging purposes have competitive advantage over non user because economies of scale, proper risk management and enhanced corporate governance structures.

4.7 Summary of Results of Test of Hypotheses

The test of hypotheses started with identifying the best fit model that satisfied regression assumptions. The FGLS model was found to be most appropriate to test the hypotheses. The test of hypothesis started with testing the direct effect of currency risk hedging techniques on financial performance. Second, the mediating effect of firm specific factors in the relationship between currency hedging and financial performance was tested. Third, the study tested the moderating effect of corporate governance in the relationship between foreign exchange risk hedging techniques and financial performance. Lastly, the joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance was assessed. The results failed to accept the null hypotheses and accepted the alternate hypotheses. Table 4.48 below presents the summary of the hypotheses tests.

Table 4.48

Summary of the Results of the Tests of Hypotheses

Hypothesis	Results	Conclusion
$H_{01:}$ There is no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya	Wald statistic (χ^2= 4.670, p-value < 0.05). The p-value is less than 0.05 implying a significant model. The model further shows that forex hedging positively influences financial performance (β =2.741 Z= 2.160, p-value < 0.05).	H_{01} Rejected
$H_{02:}$ There is no mediating effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.	Significant change in Wald statistic (χ^2= 14.39, p-value = 0.0000). The coefficient of the firm specific factor (size) remains significant (β =0.162, Z= 1.990, p-value < 0.05). The p-value of the coefficient estimate of forex hedging in the, shows insignificant effect (β =0.895, Z= 0.620, p-value > 0.05). This implies that including the meditator in the model diminishes the influence of forex hedging on financial performance to an insignificant effect.	H_{02} Rejected
$H_{03:}$ There is no moderating effect of corporate governance in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya.	The coefficient of the interaction variable has a significant influence on financial performance (β =-0.043, Z= -12.970, p-value = 0.000). The LR Chi-square statistic of 39.71 from model 2 to model 3 also has a p-value of 0.000 which is less than 0.05. This shows that there is a significant change in the likelihood ratio from model 2 to 3 upon addition of the interaction term. This confirms that corporate governance has a moderating effect on the relationship between forex risk hedging and performance.	H_{03} Rejected

$H_{04:}$ There is no significant joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance of listed firms in Kenya.	The Wald chi^2 (3) = 1482.94 for the multiple regression model has a p-value of 0.000 which shows that the estimates of the predictors are jointly not equal to zero. This implies a significant joint effect of the three predictors in the model.	H_{04} Rejected

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

As shown in Chapter one and Chapter two, empirical studies have demonstrated that hedging minimizes cash flow volatility, hence enhancing financial performance. However, hedging as a practice is not widely used in Kenya. Some Kenyan firms have embraced risk-hedging techniques to mitigate any losses potentially arising from the volatility of the Kenyan shilling, while others have not. This study sought to evaluate the effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance of listed companies in Kenya. This chapter presents the summary of the study findings, conclusions, implications and recommendations of the study.

5.2 Summary of Findings

After studying the effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance of listed firms, the study made the following findings. To begin with, the study found that most of the listed firms are locally owned, with 76.5 percent selling their products in both domestic and international markets. This implies that the listed firms are exposed to exchange risk. The study also revealed that Kenyan firms either use financial or natural hedging to hedge against currency risk. From the primary data, the firms were, on average, found to hedge less than 10 percent of the foreign exchange risks. From the secondary data, 75.93 percent of the firms practiced financial risk hedging during the study period while 24.07 percent did not. The most commonly used financial derivatives were options, followed by foreign currency denominated debt. It was also deduced that 51.85 percent of the firms used natural hedging over the 6 years studied (2011-2016) while 48.15 percent did not. The commonly used Natural hedging technique was matching costs and revenues, to hedge against currency risk.

The first objective was to determine the effect of foreign exchange risk hedging techniques on the financial performance. The corresponding null hypothesis (H_{01}) stated that there was no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya. From the regression analysis, the Wald statistic (χ^2= 4.670, p-value < 0.05). When the p-value is less than 0.05, it implying a significant model. The model further shows that forex hedging positively influences financial performance (β

=2.741 Z= 2.160, p-value = 0.031).The findings revealed a positive relationship between foreign exchange risk hedging techniques and financial performance (Tobin's Q). This was based on the secondary panel data, which was analysed by fitting panel effect data models. Thus the null hypothesis, (H_{01}) was rejected.

The second objective was to determine if there was mediating effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance. The corresponding hypothesis, (H_{02}), stated that there was no mediating effect of firm specific factors in the relationship between the foreign exchange risk hedging techniques and financial performance. Results from the three steps of the Baron and Kenny (1986) model, indicated that, first, the size of the firm was significantly predicted by currency risk hedging (β =24.191, Z= 42.300, p-value < 0.05). In the second step, the model revealed that size influences financial performance (β =0.189 Z= 2.600, p-value < 0.05). The p-value of less than 0.05 suggests the significance of the coefficient estimate. The final step of testing mediation involved conducting a multiple regression analysis in which both the currency hedging techniques and the mediator, firm specific factors predict the dependent variable, financial performance. The results showed that size, the coefficient of the firm specific factors, remained significant (β =0.162, Z= 1.990, p-value < 0.05) and the p-value of the coefficient estimate of currency hedging however showed insignificant effect (β =0.895, Z= 0.620, p-value > 0.05). This implies that including the meditator in the model diminishes the influence of currency hedging on financial performance to an insignificant effect. The study therefore concluded that there was full mediation effect, that is, firm specific factors mediate the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. Therefore, the null hypothesis, (H_{02}) was rejected.

The third objective was to establish the moderating effect of corporate governance in the relationship between foreign exchange risk hedging techniques and financial performance. The corresponding hypothesis (H_{03}) stated that there is no significant moderating effect of corporate governance in the relationship between the foreign exchange risk hedging techniques and financial performance. The moderating effect was tested using a hierarchical regression model using three steps. The results of the first step, showed a significant model with Wald statistic (χ^2= 7.120, p-value < 0.05) and p-value 0.045 implying significance of the effect of foreign exchange risk hedging techniques on financial performance. The second step involved introducing the moderating variable to the regression model, and applying a

likelihood ratio test, to check the differences between the models. Akaike and Bayesian information criteria (AIC and BIC) were used to determine the difference. The results revealed that the AIC and the BIC of model two; 304.045 and 515.766 respectively are lower than the AIC and BIC of 399.770 and 607.711 respectively, in model one. The difference between the two models was significant. In the third and last step, the interaction term was introduced to the model. The change in the model was also assessed using likelihood ratio (LR) test. The results revealed that the AIC and BIC of model three was less than that of model two implying an improvement after introduction of the interaction term. This implied that the interaction terms significantly changed the LR of the model, indicating that there is a moderating influence of corporate governance on the relationship between foreign exchange risk hedging techniques on financial performance of listed firms. Therefore, the null hypothesis, (H_{03}) was rejected and the alternate hypothesis accepted.

The fourth objective was to determine whether the joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance was significant. The corresponding null hypothesis (H_{04}) stated that there was no significant joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on financial performance. The regression results showed that foreign exchange risk hedging, firm specific factors and corporate governance had a significant joint effect on financial performance of the listed firms. Therefore, the null hypothesis, (H_{04}), was rejected.

5.3 Conclusions

Theoretically, there exists a nexus between hedging and financial performance of listed firms; currency risk hedging techniques are positively related to financial performance. The first null hypothesis, H_{01} stated that there is no significant effect of foreign exchange risk hedging techniques on the financial performance of listed firms in Kenya. From the results of the study, this null hypothesis was rejected and a conclusion drawn that foreign exchange risk hedging techniques used have a significant influence on the financial performance of listed firms in Kenya. This study therefore confirmed that currency risk hedging techniques have a positive effect on financial performance. These finding implies that foreign exchange risk hedging reduces the fluctuations of expected cash flow of firms that engage in international trade, increase the value of assets held by foreign subsidiaries, reduces the costs of servicing foreign debts and generally reduces the costs of investing abroad.

The second objective was based on the mediating effect of firm specific factors on the relationship between foreign exchange risk hedging and financial performance. A conclusion was drawn that firm specific factors, specifically the size of the firm have a mediating role in the relationship between the foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. This implies that, large firms have a wealth of knowledge to identify and implement hedging techniques in an efficient way. Large and mature firms, also enjoy economies of scale and resources, both financial and non-financial which, enables them source and employ currency risk hedging techniques in the most appropriate way.

The third objective was to establish the moderating effect of corporate governance on the relationship between foreign exchange risk hedging techniques and financial performance of listed firms in Kenya. The findings revealed that corporate governance moderates the relationship between currency hedging and financial performance. The results showed that corporate governance influences the strength of the relationship. When corporate governance is strong, firms are likely to hedge appropriately, hence improving financial performance. Strong corporate governance minimises the agency problems, promoting goal congruence, implying that, management teams working together to achieve the goals of the firm.

The last objective sought to determine whether the joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance was significant. The results revealed that there was a significant joint effect of hedging, specific firm factors and corporate governance on the financial performance of the firms. From the results, the null hypothesis was rejected and a conclusion drawn that foreign exchange risk hedging techniques, firm specific factors and corporate governance have a significant joint effect on financial performance of listed firms in Kenya.

5.4 Policy Implications and Recommendations

5.4.1 Policy Implications

This study has implications on policies relating to tax incentives, local manufacturing, derivative markets, to mention but a few. The study found that hedging has a positive effect on financial performance of listed firms in Kenya. This supports the propositions of the financial economic theory of risk management. The theory posits that hedging leads to lower volatility of cash flows, hence reducing the volatility of a firm's value and increasing

financial performance. Hedging reduces expected cash flows volatility, relieves the problem of underinvestment and reduces some costs especially for firms that are faced with convex tax function. Thoroughly planned and well-executed hedging strategies are good ingredients for firms focused on improving their financial performance.

This study revealed that natural hedging has a positive effect on financial performance. Most listed firms in Kenya use natural hedging, especially exposure netting, foreign debt and maintaining bank accounts in foreign denominated currencies, mainly US dollars and the Euro, to facilitate transactions in foreign currency. These strategies call for a good understanding of relationship between exchange rates and the relative prices of goods in different countries. These findings support the arguments put forth by the PPP theory and the IFE. The PPP explains the relationship between the exchange rates and relative price of goods in different countries; it states that there is an impulse-response relationship between exchange rates and prices (Chortareas & Kapetanios, 2013). IFE suggests that exchange rates changes are balanced out by interest rate changes, such that interest rates in appreciating currencies tend to be low enough, and in depreciating currencies tend to be high enough, to offset expected currency gains and losses. This study adds to the empirical evidence supporting the understanding of the relationship between exchange rate and prices of goods, and the understanding of the relationship between exchange rate and interest. These are central in formulating effective risk management strategies and identifying the most appropriate hedging techniques.

The study also assessed the mediating effect of firm-specific factors and found partial mediation. This finding does offer empirical support to the transaction economic cost theory in the Kenyan context. The theory explains the rationale behind firms opting in or out of the foreign market, depending on the risks involved. The theory suggests that firms invest in foreign countries with an aim of minimizing transaction costs. This study found that most Kenyan firms diversify to other countries for reasons other than hedging.

Lastly, the integrated model that assessed the joint effect of foreign exchange risk hedging techniques, firm specific factors and corporate governance on the financial performance, found that the joint effect of these variables on financial performance is significant. This supports the anchoring theory, the financial economic theory of risk management, which suggests that hedging does add value to firms, hence maximizing shareholder's wealth.

5.4.2 Policy Recommendations

The findings also have implications for corporate governance structures and practices. The study contributes to the understanding of the relationship between foreign exchange risk hedging techniques, firm specific factors, corporate governance and financial performance. From the findings, the study makes the following policy recommendations, which are aligned to the specific objectives. First, the study confirmed a positive effect of foreign exchange hedging techniques on financial performance. The study found that majority of listed Kenyan firms use natural hedging like: matching costs and revenue, leading and lagging, which do not involve financial institution. From the primary data, most firms listed on NSE hedge less than 10 percent of the foreign exchange risks. From the secondary data, 75.93 percent of the firms used financial hedging during the study period while 24.07 percent did not. It was also deduced that 51.85 percent of the firms practiced natural hedging over the studied period, 2011-2016, while 48.15 percent did not. The financial derivatives are not widely used because the derivative market is not well developed. The findings implied that thoroughly planned and well-executed hedging strategies are good ingredients for firms focused on improving their financial performance, and consequently create value for shareholders. In addition, the availability of hedging derivatives, at a reasonable cost, will encourage firms to hedge. Since the early 2000s, the Nairobi Securities Exchange (NSE) and the market regulator, Capital Markets Authority (CMA), endeavoured to introduce and develop the Futures and Options Market Segment performance (FOMS). The progress has however been very slow. The study recommends that these institutions should expedite the development of the derivatives markets, so that the hedging instruments are easily available to the Kenyan firms at a reasonable cost.

Second, the study found that firm specific factors particularly size of the firm mediate the relationship between hedging techniques and financial performance. Larger firms have the resources and expertise to employ risk hedging strategies appropriately. On the other hand smaller firms do not have the financial muscle or the expertise to hedge. This finding implies that the management should come up with new or revise the existing strategies that will help smaller firms increase their asset base and other resources. The study recommends that the government should create an enabling environment, for example; tax incentives, reduce reliance on imported goods, reduce production costs, and develop derivative markets, amongst others, to help Kenyan firms increase their asset base and their size.

Third, the study revealed that corporate governance moderates the relationship between hedging techniques and financial performance. The strength of corporate governance in an organization encourages better hedging decisions and increases the overall effectiveness of financial risk management. This implies that firms in Kenya should endeavour to strengthen their corporate governance structures and practices, since strong corporate governance encourages good risk management practices, which translates into higher financial performance and increases the firm's value. This study recommends that there should be concerted efforts by all stake holders to uphold, encourage and strengthen good corporate governance practices of Kenyan firms.

Fourth, the results confirmed that the joint effect of exchange hedging techniques, some firm specific factors and corporate governance is greater than the individual effect of hedging techniques on financial performance. This implies that to enhance financial performance, managers need to embrace risk-hedging techniques, strengthen corporate governance and be cognizant of how the firm-specific factor influences hedging and financial performance. Given the importance of hedging techniques that has been established in this study, it is vital that companies start to explore the whole repertoire of risk amelioration techniques, particularly those available in the roster of innovative techniques of hedging. In order to take full advantage of such techniques, however, the regulator and the securities exchange must lead from the front by introducing cutting-edge financial hedging instruments. In Kenya, the dearth of such instruments inhibits innovativeness surrounding risk management.

5.5 Recommendations for Further Research

Further research is necessary to address some of the limitations of this study and to broaden the knowledge and corpus relating to hedging, particularly in a developmental, African setting.

The study used both primary and secondary data. Obtaining some of the secondary data, particularly the notional amounts of financial derivatives from the audited financial statements was a great challenge. This is because this information was often not reported. Kenya follows the International Financial Reporting Standards (IFRS). IFRS 7 requires firms to disclose the notional amounts and other information about the extent and nature of derivative financial instruments. Firms should disclose by class (e.g., interest rate contract or foreign exchange contract) and by type (e.g., forwards, futures, credit default swaps, total return swaps and options). Majority of the Kenyan firms do not disclose this information, yet

this is critical disclosure requirement that is also in keeping with freedom of information provisions of the constitution (Article 35). Regulatory bodies should enforce this requirement to enable future researchers obtain relevant data. When collecting primary data, the respondents were either the Chief Finance Officer or Chief Risk Officer. One respondent in each organization completed the questionnaire. To mitigate the effect of single respondent bias, future research should involve multiple respondents including mid-level managers as well as risk management committee members of the board.

In this study, financial performance was measured using the widely used market measure, Tobin's Q. Future research should broaden the operationalization of financial performance to include other measures like accounting measures to enhance comparability. In addition, future studies may consider inclusion of other microeconomic and macroeconomic firm-specific factors, which may influence the relationship between exchange hedging techniques and financial performance either as moderating or mediating variables.

Lastly, the study should be replicated in privately held firms, and in other countries and geographical regions. Such replication could further determine whether the findings of this study hold true for other firms or countries with different cultural, regulatory, governance, and management contexts. This will enhance understanding of the relationship between foreign exchange risk hedging and financial performance in different contexts and environments.

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APPENDICES

Appendix I: Study Questionnaire

Section I. Organization's Profile

Kindly write or tick the appropriate answer in the space provided:

1. Name of your organization……

2. Your position within the organization……...

3. Location of your head office…….

4. Majority ownership of your firm (tick one)

a. Local [ ]

b. Foreign [ ]

c. Others [ ] Please specify……

5. Indicate the number of years which your firm has been in operation in Kenya (tick as appropriate)

a. Less than 6 years [ ]

b. 6 to 10 years [ ]

c. 11 to 15 years [ ]

d. 16 to 20 years [ ]

e. More than 20 years [ ]

6. Products or services are mostly sold in:

a. Domestic markets only [ ]

b. Foreign markets only [ ]

c. Domestic and foreign markets [ ]

7. Raw materials, products and services are mostly sourced from:

a. Domestic markets only [ ]

b. Foreign markets only [ ]

c. Domestic and foreign markets [ ]

8. Currency mostly used in buying and selling in the foreign markets

a. US Dollar [ ]

b. Sterling Pound [ ]

c. Euro [ ]

e. Others [ ] Please specify……

9. What is the proportion of your firm's total sales or revenues generated from foreign market (foreign sales to total sales)?

a. Less than 10% [ ]

b. 10% - 25% [ ]

c. 25% -50% [ ]

d. 50% -75% [ ]

e. 75% - 100% [ ]

10. What is the proportion of your firm's total costs from foreign markets (foreign sales costs to total costs)?

a. Less than 10% [ ]

b. 10% - 25% [ ]

c. 25% -50% [ ]

d. 50% -75% [ ]

e. 75% - 100% [ ]

11. What is the proportion of foreign debt to total debt of your firm?

a. Less than 10% [ ]

b. 10% - 25% [ ]

c. 25 % -50% [ ]

d. 50 % -75% [ ]

e. 75% - 100% [ ]

12. What percentage of foreign risk is hedged by your firm?

a. Less than 10% [ ]

b. 10% - 25% [ ]

c. 25% -50% [ ]

d. 50% -75% [ ]

e. 75% - 100% [ ]

Section II: Financial Hedging Techniques

The statements presented below describe types of financial hedging techniques in your firm. Please indicate the frequency of each technique used by ticking '✓' in the appropriate box (from 1 to 5); where: 1= Never (N); 2 = Sometimes (S); 3 = Often (O); 4 = Very Often (VO); 5 = Always

a) Financial hedging techniques	**N 1**	**S 2**	**O 3**	**VO 4**	**A 5**
1.Forward contracts	1	2	3	4	5
2. Futures contracts	1	2	3	4	5
3. Swaps	1	2	3	4	5
4. Options	1	2	3	4	5
5. Foreign currency denominated debt	1	2	3	4	5
6. Others (please specify)….....	1	2	3	4	5

The statements presented below describe possible effect of financial hedging techniques on financial performance in your firm. Please indicate the extent to which you agree that each of the statements describes your firm by ticking '✓' in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

b) Given the current use of financial hedging, fluctuation of home currency (Kenya Shilling) will	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1. Increase profits	1	2	3	4	5
2. Increase costs	1	2	3	4	5
3. Increase earnings volatility	1	2	3	4	5
4. Increase the market value of the firm	1	2	3	4	5
5. Maintain competitive advantage	1	2	3	4	5
6. Others (Please specify)……	1	2	3	4	5
c) Based on the notional value of contracts, your firm's derivative usage since 2011 have	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1. Increased	1	2	3	4	5
2. Decrease	1	2	3	4	5

Section III: Natural (Operational) Hedging Techniques

The statements presented below describe types of natural (operational) hedging techniques in your firm. Please indicate the frequency of each strategy used by ticking '✓' in the appropriate box (from 1 to 5); where: 1= Never (N); 2 = Sometimes (S); 3 = Often (O); 4 = Very Often (VO); 5 = Always

a) Natural (Operational) hedging techniques	**N 1**	**S 2**	**O 3**	**VO 4**	**A 5**
1. Diversification across countries (having subsidiaries in different countries)	1	2	3	4	5
2. Matching costs and revenues	1	2	3	4	5
3. Netting inter-firm cash flows	1	2	3	4	5
4. Currency choice in invoicing	1	2	3	4	5
5. Price adjustments	1	2	3	4	5
6. Leading and lagging	1	2	3	4	5
8. Others (Please specify) ……	1	2	3	4	5

The statements presented below describe the possible effect of operational hedging techniques on the following aspects of your firm. Please indicate the extent to which you agree that each of the statements describes your firm by ticking '✓' in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

b) Given the current use of natural hedging, depreciation of home currency (Kenya Shilling) will	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1. Reduce profits	1	2	3	4	5
2. Increase costs	1	2	3	4	5
3. Increase the possibility of financial distress	1	2	3	4	5
4. Increase earnings volatility	1	2	3	4	5
5. Increase the market value of the firm	1	2	3	4	5
6. Maintain competitive advantage	1	2	3	4	5
7. Others (Please specify)……	1	2	3	4	5

Section IV: Firm Specific Factors

The statements presented below describe aspects of factors that influences foreign exchange risk management techniques in your firm. Please indicate the extent to which you agree that each of the statements describes your firm by ticking '✓' in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

Firm size- Our firm's foreign risk management techniques are influenced by	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1. The firm's total annual sales.	1	2	3	4	5
2. The market value of the firm's total assets	1	2	3	4	5
3. The firm's total equity capital	1	2	3	4	5
Firm maturity – Our firm's foreign risk management techniques are influenced by					
1. Number of years in operation	1	2	3	4	5
Level of foreign involvement- The techniques used in foreign exchange risk management by our firm are influenced by					
1. The percentage of export revenue to total revenue	1	2	3	4	5
2. The percentage of import expenditures to total costs	1	2	3	4	5
3. The percentage of foreign denominated debt to total debt	1	2	3	4	5
Cost of foreign exchange management					
1. The cost of hedging is too high	1	2	3	4	5
Liquidity					
1. At our firm, the level of liquidity hinders the use of foreign exchange management techniques.	1	2	3	4	5
Ownership structure					
1. Large percentage of shares is held by top management	1	2	3	4	5

2. Large percentage of shares is held by institutional investors	1	2	3	4	5
3. Most shares are held by individual investors	1	2	3	4	5

Section V: Corporate Governance

The statements presented below describe aspects of corporate governance within your firm. Please indicate the extent to which you agree that each of the statements describes your firm by ticking '✓' in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

Corporate Governance – The number and size of Board of Directors influences:	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1. The guidance on the foreign risk hedging techniques adopted.	1	2	3	4	5
2. The resources available for foreign risk hedging.	1	2	3	4	5
3. Empowerment of the risk management team	1	2	3	4	5
4. The periodically reviews on the effectiveness of hedging	1	2	3	4	5
The ownership structure influences					
1. General attitude towards foreign exchange risk hedging	1	2	3	4	5
2. How the top management initiates foreign risk hedging programs	1	2	3	4	5
3. How the top management give guidance on foreign risk management	1	2	3	4	5

Section VI: Financial Performance
Please provide the following data for the last six years:

	2011	2012	2013	2014	2015	2016
	Shs.	**Shs.**	**Shs.**	**Shs.**	**Shs.**	**Shs**
Total Assets						
No of ordinary shares outstanding						
Market Price						

Thank you for taking time to complete the survey and answering all questions.

Your help is greatly appreciated

Appendix II: Secondary Data Capture Sheet

Name of the firm……

	2011	2012	2013	2014	2015	2016
	Shs.	**Shs.**	**Shs.**	**Shs.**	**Shs.**	**Shs.**
HEDGING TECHNIQUES						
Financial Hedging (Yes or No)						
Natural Hedging (Yes or No)						
FIRM SPECIFIC FACTORS						
Size=Logarithm of Total assets						
Age						
Long Term Debt (Leverage)						
Share Holder's Equity						
Leverage = Long-term debt/shareholder's equity						
Capital Expenditure						
Total Sales (TS)						
Foreign Sales (FS)						
Investment Opportunities= Capital Exp/Total sales						
Diversification = Foreign Sales/Total Sales						
Current Assets (CA)						
Current liabilities (CL)						
Liquidity= Current Assets/Current Liabilities						
CORPORATE GOVERNANCE						
Board Size =Total number of Directors(TD)						
Number of independent directors (ID)						
Board Independence= ID/TD						
Larger Insider Block Holders						

Larger Outsider Block Holders						
CEO duality						
FINANCIAL PERFORMANCE						
Number of Shares						
Market Price						
Total Market Value						
Total Assets						
Tobin's Q **= Total Mkt value/ total assets**						

Appendix III: Statistical analysis models

Appendix III-1: Latent construct (FSF) on Tobin's Q

Coefficients: generalized least squares

Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.8505)

Estimated covariances	= 1485	Number of Obs	= 324
Estimated autocorrelations	= 1	Number of groups	= 54
Estimated coefficients	= 1	Time periods:	6
		Wald chi2(1)	= 23.4
		Prob > chi2	= 0.000

Tobin's Q	**Coefficients.**	**Bootstrap Std. Err.**	**Z**	**P>/z/**
FSF (Age and Size factor)	0.5821	0.1203	4.8400	0.0000

Appendix III-2: Currency hedging on the Latent construct (FSF)

Coefficients: generalized least squares

Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.9748)

Estimated covariances	= 1485	Number of Obs	= 324
Estimated autocorrelations	= 1	Number of groups	= 54
Estimated coefficients	= 1	Time periods:	= 6
		Wald chi2(1)	= 1.37
		Prob > chi2	= 0.242

FSF (Age and Size factor)	**Coefficients.**	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Currency Hedging	-0.244	0.209	-1.170	0.242

Appendix III-3: Firm specific factors on Tobin's Q

Coefficients: generalized least squares

Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.8741)

Estimated covariances	= 1485	Number of Obs	= 324
Estimated autocorrelations	= 1	Number of groups	= 54
Estimated coefficients	= 6	Time periods:	= 6
		Wald chi2(5)	= 44.88
		Prob > chi2	= 0.000

Tobin's Q	**Coefficients.**	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Size	0.004	0.002	2.355	0.019
Age	0.006	0.003	1.980	0.048
Inv opp	0.005	0.005	0.990	0.323
Liquidity	0.000	0.000	-0.150	0.878
Geo div	-0.002	0.017	-0.150	0.883

Appendix III-4: Currency hedging on Age

Coefficients: generalized least squares

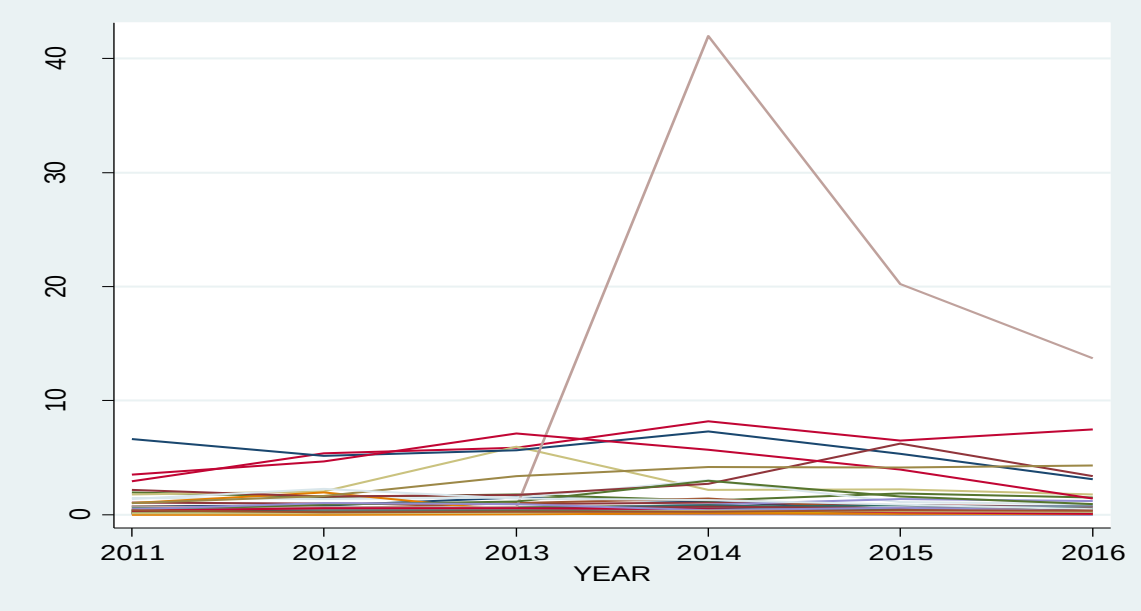
Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.9914)

Estimated covariances	= 1485	Number of Obs	= 324
Estimated autocorrelations	= 1	Number of groups	= 54
Estimated coefficients	= 1	Time periods:	= 6
		Wald chi2(1)	= 1.710
		Prob > chi2	= 0.191

Age	**Coefficients.**	**Bootstrap Std. Err.**	**Z**	**P>/z/**
Currency Hedging	0.010	0.007	1.308	0.191

Appendix III-5: Spaghetti Plot for Tobin's Q



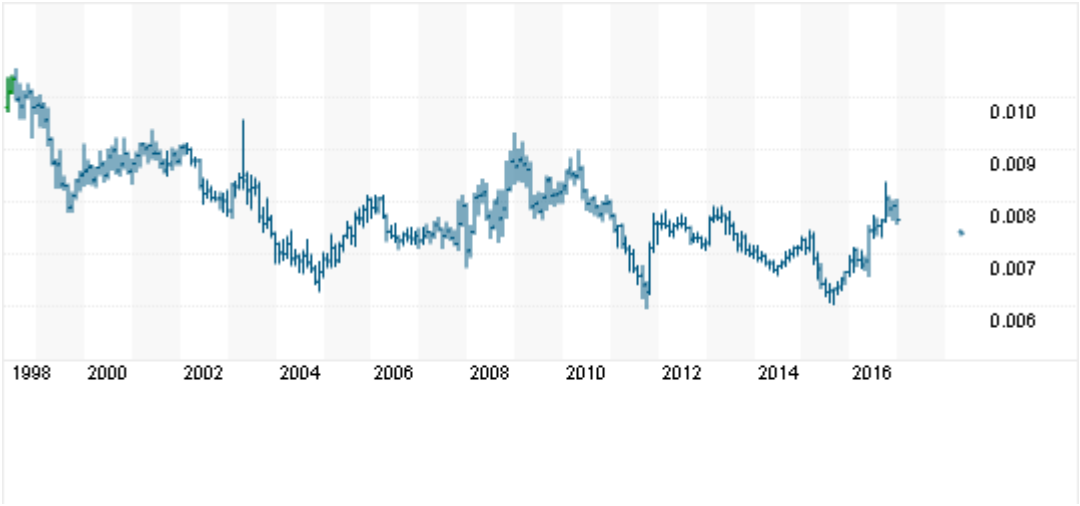
Source: Research Data, 2018

The spaghetti plot above, shows the trend lines for each entity over the 6-year period. The plot virtually shows that there are differences in Tobin's Q between the entities. Majority of the entities however had very low Tobin's Q

Appendix IV: Exchange Rates Charts

KES/USD Exchange Rate 1998-2016

KES/GBP Exchange Rate 1998-2016



Source: Reuters Currencies Charts

Appendix V: Firms listed on Nairobi Securities Exchange as on December 31, 2016

	Head office	Date listed
AGRICULTURAL		
1. Eaagads Ltd	Kenya	1972
2. Kapchorua Tea Co. Ltd	Kenya	1972
3. Kakuzi Limited	Kenya	1951
4. Limuru Tea Co. Ltd	Kenya	1967
5. Rea Vipingo Plantations Ltd	Kenya	1996
6. Sasini Ltd	Kenya	1965
7. Williamson Tea Kenya Ltd	Kenya	1972
AUTOMOBILES AND ACCESSORIES		
8. Car and General (K) Ltd	Kenya	1940
9. Sameer Africa Ltd	Kenya	1994
10. Marshalls (E.A.) Ltd	Kenya	1969
BANKING		
11. Barclays Bank Ltd	UK	1986
12. CFC Stanbic Holdings Ltd	Kenya	2011
13. Diamond Trust Bank Kenya Ltd	Kenya	1972
14. Housing Finance Co Ltd	Kenya	1992
15. Kenya Commercial Bank Ltd	Kenya	1988
16. National Bank of Kenya Ltd	Kenya	1994
17. NIC Bank Ltd	Kenya	1971
18. Standard Chartered Bank Ltd	UK	1989
19. Equity Bank Ltd	Kenya	2006
20. The Co-operative Bank of Kenya Ltd	Kenya	2008
COMMERCIAL AND SERVICES		
21. Express Ltd	Kenya	1978
22. Kenya Airways Ltd	Kenya	1996
23. Nation Media Group	Kenya	1973
24. Standard Group Ltd	Kenya	1954
25. TPS Eastern Africa (Serena) Ltd	Kenya	1997
26. Scangroup Ltd	Kenya	2006
27. Uchumi Supermarket Ltd	Kenya	1992

28. Longhorn Kenya Ltd	Kenya	1993
CONSTRUCTION AND ALLIED		
29. Athi River Mining	Kenya	1997
30. Bamburi Cement Ltd	UK	1970
31. Crown Berger Ltd	Kenya	1992
32. E.A.Cables Ltd	Kenya	1973
33. E.A.Portland Cement Ltd	Kenya	1973
ENERGY AND PETROLEUM		
34. KenolKobil Ltd	Kenya	1959
35. Total Kenya Ltd	France	1988
36. KenGen Ltd	Kenya	2006
37. Kenya Power & Lighting Co Ltd	Kenya	1972
INSURANCE		
38. Jubilee Holdings Ltd	Kenya	1984
39. Pan Africa Insurance Holdings Ltd	Kenya	1963
40. Kenya Re Insurance Corporation Ltd	Kenya	2007
41. Liberty Kenya Holdings Ltd	South Africa	2007
42. British American Investments Company (Kenya)	Kenya	2011
INVESTMENT		
43. Olympia Capital Holdings Ltd	Kenya	1974
44. Centum Investment Co Ltd	Kenya	1967
45. Trans Century Ltd	Kenya	2011
MANUFACTURING AND ALLIED		
46. B.O.C Kenya Ltd	UK	1969
47. British American Tobacco Kenya Ltd	UK	1969
48. Carbacid Investments Ltd	Kenya	1972
49. East African Breweries Ltd	Kenya	1972
50. Mumias Sugar Co. Ltd	Kenya	2001
51. Unga Group Ltd	Kenya	1971
52. Eveready East Africa Ltd	Kenya	2006
53. Kenya Orchards Ltd	Kenya	1959
TELECOMMUNICATION AND TECHNOLOGY		
54. Safaricom Ltd	Kenya	2008

Source: Adopted and Modified from the NSE Website (2016)

Appendix VI: Questionnaire Cover Letter

Monica Wanjiru Muiru,
Egerton University,
Faculty of Commerce,
P. O. Box 13357 – 20100,
Nakuru.
Telephone: 254 722 54 55 61

To Whom It May Concern

Dear Sir/Madam,

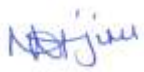
RE: REQUEST FOR RESEARCH DATA FROM YOUR FIRM

I am a PhD student at Faculty of Commerce, Egerton University. To fulfil the requirement of the degree, I am conducting a research study on "The Effect of Foreign Exchange Risk Management on Firm's Financial Performance: Evidence from Selected Listed Firms in Kenya". Your company has been identified as a participant in this survey.

Kindly fill the attached questionnaire by providing appropriate response to each question. This will be of great help in my academic research. The information provided will be treated with strict confidentiality and will be used for academic purpose only. Your name will not be mentioned in this research. The findings will be provided to your firm upon request. I greatly appreciate your time, contribution and your firm's participation in this survey.

Thank you,

Yours sincerely,



Monica Muiru,
PhD Student
E-mail: mshirom@yahoo.com

Appendix VII: Research Authorization by Egerton University

EGERTON UNIVERSITY
Tel: Pilot: 254-51-2217620
254-51-2217877
254-51-2217631
Dir.line/Fax: 254-51-2217847
Cell Phone
Extension: 3606

P.O. Box 536 - 20115
Egerton, Njoro, Kenya
Email: bpgs@egerton.ac.ke
www.egerton.ac.ke

OFFICE OF THE DIRECTOR GRADUATE SCHOOL

CD11/0484/14 — 20th July, 2017

Ref:..... Date:.....

Ms. Monica Wanjiru Muiru
Dept. of Acc.Fin.& Management Science
Nakuru Town Campus
NAKURU

Dear Ms, Muiru,

RE: CORRECTED PROPOSAL

This is to acknowledge receipt of two copies of your corrected proposal, entitled **"Effect of Foreign Exchange Risk Hedging Techniques, Firm Specific Factors, Corporate Governance of Financial Performance of Listed Firms in Kenya."**

You are now at liberty to commence your fieldwork. However note the following:

1. You must register each semester
2. Pay your fees every semester
3. Submit progress reports every four (4) months (Masters) or six (6) months (PHDs). Without this, your thesis/project will not be accepted. Forms are available at the Board
4. You are expected to publish one (1) paper (Masters) or two (2) papers (PhD) in peer-reviewed journal and present them before issuance of "Intent to submit Thesis/i ;oject" forms by the board

Thank you.

Yours sincerely,

Prof. Nzula Kitaka
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

c.c. Supervisors
COD, Acc. Fin.& Mgt. Sc.
Dean, Commerce

NK/ear

Appendix VIII: Research Authorization by NACOSTI

NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website:www.nacosti.go.ke
Whenreplying pleasequote

9th Floor, Utalii House
Uhuru Highway
P O Box 30623-00100
NAIROBI-KENYA

Ref No: **NACOSTI/P/17/03485/18602**

Date **18th August, 2017**

Monica WanjiruMuiru
Egerton University
P.O. Box 536-20115
EGERTON.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Effects of foreign exchange risk hedging techniques ,firm specific factors and corporate governance on financial performance of listed firms in Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **All Counties** for the period ending **17th August, 2018.**

You are advised to report to **the County Commissioners and the County Directors of Education,All Counties** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
All Counties.

The County Director of Education
All Counties.

Appendix IX: Research Permit from NACOSTI

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 15397

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MS. MONICA WANJIRU MUIRU
of EGERTON UNIVERSITY, 0-100
NAIROBI,has been permitted to conduct
research in*All Counties County*

on the topic: *EFFECTS OF FOREIGN EXCHANGE RISK HEDGING TECHNIQUES, FIRM SPECIFIC FACTORS AND CORPORATE GOVERNANCE ON FINANCIAL PERFORMANCE OF LISTED FIRMS IN KENYA*

for the period ending:
17th August,2018

.....
Applicant's Signature

Permit No : NACOSTI/P/17/03485/18602
Date Of Issue : 18th August,2017
Fee Recieved :Ksh 2000

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

Appendix X: Abstracts of my Publications

Publication I: Effect of Foreign Exchange Risk Hedging Techniques on Financial Performance of Listed Firms in Kenya

Publisher: International Journal of Accounting and Financial Reporting. Vol 8, No 3 (2018).
http://www.macrothink.org/journal/index.php/ijafr/article/view/13512

Monica Wanjiru Muiru, Sifunjo E. Kisaka, Fredrick Kalui

Abstract

The adoption of floating foreign exchange rate regime in the 1990s and international trade have led to increased exposure of Kenyan firms to foreign exchange risk. Foreign exchange risk can affect a firm's expected cash flows, and by extension, its financial performance. This paper examines the effects of foreign exchange risk hedging techniques on the financial performance of publicly listed firms in Kenya. The target population constituted all the 54 firms that were continuously listed on the Nairobi Securities Exchange during the study period, from 2011 to 2016. The study used panel data research design. Secondary data was obtained from financial statements of the listed firms. The data was coded and analysed using descriptive and inferential statistics—correlation and regression—with the aid of STATA software. The feasible generalised least square model was used to test the hypotheses. The results show currency hedging has a positive effect on financial performance. This implies that when hedging strategies and hedging tools are implemented appropriately, they help firms achieve their financial objectives, increasing financial performance, hence creating value for shareholders.

Publication II: Foreign Exchange Risk Hedging, Corporate Governance and Financial Performance: Evidence from Kenya

Publisher: Research Journal of Finance and Accounting. Vol 10, No 5 (2019)
https://iiste.org/Journals/index.php/RJFA/article/view/46919

Monica Wanjiru Muiru, Lawrence Kangogo Kibet, Fredrick Kalui

Abstract

Globalization, Kenya's floating foreign exchange rate regime, and international trade have exposed Kenyan firms to foreign exchange risk. Empirical studies have demonstrated that hedging minimizes cash flow volatility, hence enhancing financial performance. The management of these risks is critical in overall financial management, since its helps increase the financial performance and the overall returns earned by investors. Understanding factors that influence foreign exchange risks hedging is a crucial step to the effectiveness of the overall risk management process. Against this background, this study sought to evaluate the effects of foreign exchange risk hedging, corporate governance and the financial performance of listed companies in Kenya. The target population constituted all the 54 firms that were continuously listed on the Nairobi Securities Exchange during the study period, from 2011 to 2016. The study used longitudinal research design. Secondary data was obtained from financial statements of the listed firms. The data was coded and analysed using descriptive and inferential statistics—correlation and regression—with the aid of STATA software. The feasible generalised least square model was used to test the hypotheses. The results show currency hedging has a positive effect on financial performance. The study also revealed that corporate governance, moderates the relationship between foreign exchange risk hedging and financial performance. In the light of this findings, management should explore the whole repertoire of risk amelioration techniques, particularly those available in the roster of innovative techniques of hedging. In order to take full advantage of such techniques, however, the regulator and the securities exchange must lead from the front by introducing cutting-edge financial instruments. In addition firms should endeavor to strengthen corporate governance which enhances the effectiveness of risk management.

Keywords: Foreign Exchange risk, Hedging Techniques, Corporate Governance.

Publication date: March 31st 2019