

Foreign Exchange Risk Hedging, Corporate Governance and Financial Performance: Evidence From Kenya

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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 it helps increase the financial performance and the overall returns earned by investors. Understanding factors that influence foreign exchange risk 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.

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1. Introduction

Foreign exchange risk is one of the most common forms of financial risk encountered by firms operating in the local and international markets. Floating foreign exchange rate regime, globalization and international trade have exposed Kenyan 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 exchange rates. 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 it helps increase the financial performance and the overall returns earned by investors. On the other hand, if the risk is not managed, it may result in financial losses, financial distress or total business failure (Mahidhar, 2006). Understanding factors that influence foreign exchange risk hedging is a crucial step to the effectiveness of the overall risk management process.

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

The decision on whether to hedge or not, and the hedging techniques that are ultimately adopted, are all influenced by the corporate governance, amongst other factors. Corporate governance is concerned with board structures, processes and systems that drive the enterprise towards the achievement of its set goals (Osuo, 2019).

Samy and Osuoha, 2015). The board of directors and its related committees provides direction and oversight of the corporate governance process. The board of directors' acts on behalf of shareholders, therefore the board size, board composition, number of independent directors, CEO duality and ownership structure can strengthen or weaken the use and the effectiveness of hedging techniques. Ownership structure provides an indicator of who owns majority shares, whether external large block holder or large internal block holder. External blockholder are mainly institution investors, while internal large block holders involve family ownership. Firms with large institutional investors have strong financial incentives and large stake 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. Firms with strong corporate governance are likely to hedge; they are also likely to use financial derivative for hedging purpose and not for speculation (Allayannis, Lel and Miller 2012).

1.1 Research Objective

The general objective of this study was to evaluate the effects of foreign exchange risk hedging and corporate governance on the financial performance of listed companies in Kenya.

The specific objectives of this study were:

- i. To assess the effect of foreign exchange risk hedging on financial performance of listed firms in Kenya.
- ii. To establish the moderating effect of corporate governance on the relationship between foreign exchange risk hedging and financial performance of listed firms in Kenya.
- iii. To establish the joint effect of foreign exchange risk hedging and corporate governance on financial performance of listed firms in Kenya.

1.2 Hypotheses of the Study

To investigate the topic under study, the following hypothesis were be tested:

- i. H₀₁: There is no significant effect of foreign exchange risk hedging on the financial performance of listed firms in Kenya
- ii. H₀₂: There is no moderating effect of corporate governance in the relationship between the foreign exchange risk hedging and financial performance of listed firms in Kenya.
- iii. H₀₃: There is no significant joint effect of foreign exchange risk hedging and corporate governance on financial performance of listed firms in Kenya.

2.0 Literature Review

This section presents empirical studies on the relationship between foreign exchange risk hedging, corporate governance and financial performance. The strength of corporate governance of a firm may affect the hedging techniques adopted and the effectiveness of the hedging. Allayannis, Lel and Miller (2004) investigated the impact of corporate governance and hedging premium around the world for a period of ten years. The researchers found that hedging has a positive impact on the firm's value and corporate governance is an important factor in assessing the value of hedging policies. The study established that hedging premium is statistically significant in large firms with strong internal corporate governance. The study also established that hedging premium is insignificant for firms with weak internal governance. These 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 corporate governance influence how firms hedge foreign exchange risk. The results indicated that strongly governed firms are likely to use derivatives to hedge 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 of 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 increases 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.

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 undertaken to deal with financial risk exposure.

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 percentage of family ownership with highest control, managerial ownership and the associated companies. 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 the use of hedging techniques, consequently, financial performance. This study sought to assess the effect of corporate governance on the relationship between currency risk hedging and financial performance. Therefore, this study hypothesis that corporate governance has a moderating effect on the relationship between foreign exchange hedging techniques and financial performance of listed firms in Kenya.

3.0 Research Methodology

3.1 Research Design

This study used longitudinal research design. This design was deemed appropriate since the purposes of the study was to assess the effect of currency hedging and corporate governance on the financial performance of listed firms in Kenya for a period of six years. This design assisted in analyzing the changes in the relationship between the dependent and independent variables, within the firms and within variables over time.

3.2 Population and Sampling

The target population comprised of all the 54 firms that were continuously listed on NSE during the study period from 2011 to 2016. The selection of the period was guided by previous studies on foreign exchange risk hedging and firm performance like (Butt, *et al*, 2018). Since the study used all listed firms, sampling was not necessary.

3.3 Data Collection

Secondary data was extracted from the listed firm's audited financial statements from 2011 to 2016. These reports were obtained from Capital Markets Authority, Nairobi Securities Exchange data banks and from the websites of these firms.

3.4 Measurement of Study Variables

The financial hedging techniques was measured using categorical variables, where a value of 1 was assigned if the firm reports the use of financial derivatives for hedging purpose and 0 if otherwise. Likewise, the natural hedging techniques were measured using dummy variables, where a value of 1 was assigned if the firm reports the use of natural hedging techniques and 0 if otherwise. Financial performance was measured using Tobin's Q as the proxy for firm's financial performance. 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 used by most of the researchers in similar studies like (Wolfe & Sauaia 2003) and (Li, *et al*, 2014). The modified ratio is calculated by dividing the market value of a company plus debt divided by the value of its total assets. Corporate governance was assessed along the following dimensions: board size, board independence, ownership structure and CEO duality. The board size was measured as the natural log of number of directors on the company's board, at the end fiscal year as done. Board independence was assessed as the percentage of independent directors of board membership excluding the chairman to the total number of board members following (Ahmed, *et al.*, 2014). Ownership structure was measured along two dimensions, larger insider block holder and larger insider block holders. The larger insider block holders was measured using dummy variables where the value of 1 was assigned if the insider largest block holder, owns 10% or more of outstanding shares and is in the firm management, and 0 otherwise (Lang, Lins, and Miller 2003). The larger outsider block holders was also measured on a nominal scale where 1 was assigned if the largest block holder is not in the firm management, and 0 otherwise (Lang, *et al*, 2003). Lastly CEO duality was operationalized using dummy variables where a value of 1 if the firm's CEO is also the chairman of the board, 0 if otherwise (Allayannis, *et al.* 2004)

4.0 Data Analysis

Data was analyzed using descriptive and inferential statistics. The descriptive statistics used were mean, median and standard deviation. The inferential statistics used were correlation and regression analysis. The analysis was done with aid of the STATA software. The feasible generalized least square regression model used. Financial performance was regressed on the dimension of foreign risk hedging techniques. The following multiple

regression model was used:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \epsilon_{it} \dots\dots\dots(6.1)$$

Where:

Y_{it} = Financial Performance for firm i at time t

β_0 = Y intercept

β_1 = regression coefficients

X_1 = Foreign exchange risk hedging

ϵ = regression error term

To test the 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.

$$Y_{it} = \alpha + \beta_2 X_{1it} + \beta_3 Z_{1it} + \beta_4 XZ_{it} + \epsilon_{it} \dots\dots\dots(6.2)$$

Where: Y_{it} = Financial Performance for firm i at time t

α = y intercept

β_2 = the coefficient relating the independent variable (Foreign exchange risk hedging techniques)

β_3 = coefficient relating the moderator variable, Z, (Corporate governance)

β_4 = estimate of the moderation effect. If β_4 is statistically different from zero, there is significant moderation of the X-Y relation.

X_1 = Independent variable (Foreign exchange risk hedging techniques)

Z_1 = Moderating variable (Corporate governance)

XZ = interaction between independent and the moderating variable

ϵ = regression error term

4.1 Descriptive Data Analysis

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

4.1.1 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 the indicators; financial hedging techniques and natural hedging techniques. Both were measured on a binary categorical scale.

Table 4. 1: FX Risk Hedging Techniques

	Dummy Variable	Proportion	Std. Err.	Binomial Wald [95% Conf. Interval]	
Financial Hedging	0	.7585139	.0238506	.7115912	.8054367
	1	.2414861	.0238506	.1945633	.2884088
Natural Hedging	0	.504644	.0278627	.449828	.5594599
	1	.495356	.0278627	.4405401	.550172

Source: Research Data, 2018

Table 4.1 presents a summary of both financial and natural hedging techniques. Amongst all the listed firms, 49 percent use natural hedging and 50% do not use natural hedging. On the other hand, 24% use financial hedging and 75 percent do not use financial hedging. This is consistent the finding of Afza and Alam (2016) which revealed that fewer firm in developing countries use financial derivatives compared to their counterparts in developed countries.

4.1.2 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 4.2: CEO Duality

CEO duality	Overall		Between		Within
	Freq.	Percent	Freq.	Percent	Percent
0	323	100	54	100	100
Total	323	100	54	100	100

(n=54)

Source: Research Data, 2018

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 4.2, the overall, between and within percentages are 100 percent, implying that all the CEOs of the entities for all the six years were not chair of the boards. The variable had no variation and was therefore not used for further analysis.

Table 4.3: Ownership Structure

	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	100	54	100	100

(n=54)

Source: Research Data, 2018

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 4.3 above, the overall entity year's proportions show that only 20.37 percent of the entities had the largest insider blockholder while 79.63 percent of the firms had the larger 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 4.4: Board Size and Board Independence

Variable	Variations	Mean	Std. Dev.	Min	Max	Observations
Number of directors	overall	8.463	2.347	4	15	N = 324
	between		2.341	4	15	n = 54
	within		0.334	6.463	10.130	T = 6
Number of independent directors	overall	6.160	2.241	2	11	N = 324
	between		2.233	2	11	n = 54
	within		0.337	4.494	8.994	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

Source: Research Data, 2018

Table 4.4 above shows that the average board size of these firms had nine 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 number of 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.

4.1.3 Financial Performance of the Listed Firms

The dependent variable, financial performance was measured on a continuous scale using the indicator Tobin's Q which 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 4.5: 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	80.719	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 4.5 shows the summary statistics of the indicators used to determine Tobin's Q. All the components showed high overall variation which are time variant but that depict higher variation between groups of the entities than within. The mean shares, 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 both reflected both in the variation between and within with standard deviations of 2.095 and 2.117 respectively

5.0 Results, Discussions and Findings

5.1 Model Specification and Regression Diagnostic Tests

To test hypotheses and draw conclusions on study objectives, statistical models were fitted for the panel dataset. The objective of the study was to determine the effects of foreign exchange risk hedging techniques and corporate governance on financial performance of listed firms in Kenya. Foreign exchange hedging techniques were regressed on financial performance to test the hypotheses and draw conclusions on the objectives. The Feasible Generalized Least Squares (FGLS) model was adopted after Hausman test was done for model specification and which favored the use of the random effect model.

Hausman test was used to choose between the fixed and random effect model. The test's null hypothesis stated: random effect model is appropriate, while the alternate stated: fixed effect model is appropriate. The Wald chi-square statistic computed was 1.18, with a p-value of 0.5548. The p-value of the Chi-square statistic was greater than 0.05, thus the null hypothesis was rejected and alternate hypothesis accepted. This means that the random effect model was the preferred model for testing the effect of hedging on financial performance. The Wooldridge F-statistic was used to test the existence of serial correlation and the p value of the F-statistics was 0.0089 which was less the 0.05, indicating the presence of serial correlation. Panel data model estimation also assumes panel homoscedasticity of the error variances (Hsiao, 2003). To test for the existence of significant heteroscedastic error variances, which disqualifies the homoscedasticity assumption, Wald test was used. The p-value of the Wald statistic was 0.000, which is less than 0.05 implying presence of heteroscedasticity.

Alejo, Galvao, Montes-Rojas and Sosa-Escudero (2015) recommends checking for non-normal errors in regression models. The Bera-Jarque (JB) test for the normality of the error was used. The JB chi-square statistics for the e and u components had p-values of 0.017 and 0.0454 respectively. Both were less than 0.05, implying that the error components were not normally distributed thus a violation of the normality assumption. Another

assumption when estimating panel data models is that of cross-sectional independence which assumes that cross-sectional observations are not correlated. The Pesaran Friedman test for cross-sectional dependence in random effect models was carried and the p-value of the Z statistic was 0.000, which is less than 0.05 implying presence of cross-sectional correlation of the residuals. The assumption of cross sectional independence was thus violated.

5.2 Results and Findings

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

5.2.1 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 5.1 below.

Table 5. 1: 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 chi2(2)	= 6.19
			Prob > chi2	= 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 5.1 above, show that the model is generally significant with a Wald chi-square statistic ($\chi^2 = 6.19$, p-value = 0.045). The model also shows that natural hedging had a significant influence on financial performance ($\beta = 2.173$, $Z = 2.120$, p-value = 0.034). 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 ($\beta = 0.589$, $Z = 0.370$, p-value = 0.710). The p-value of the z-statistic was greater than 0.05 implying insignificance of the coefficient. 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 model regression model was fitted. It considered currency risk hedging as a combination of both hedging techniques, since having all the three in one model would violate the assumption of non-multi-collinearity. The currency 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 5.2 below presents the results.

Table 5.2: 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 chi2(1)	= 7.120
		Prob > chi2	= 0.008

	Coefficients.	Bootstrap Std. Err.	Z	P> z/
Forex risk Hedging	3.596	1.595	2.250	0.024
_Cons	1.192	1.437	0.830	0.407

The results in table 5.2, above, shows the model Wald statistic ($\chi^2 = 7.120$, p-value = 0.008). The p-value was less than 0.05 implying a significant model. The model further shows that currency hedging influence financial performance ($\beta = 3.596$ $Z = 2.250$, p-value = 0.024). The p-value is less than 0.05 implying significance of the coefficient estimate. The estimated model formulated in an equation takes the form:

$$Y_{it} = 3.596X_{it} + \mu_{it} + \epsilon_{it}$$

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. The significant coefficient 3.596 implies 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 than 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 improve financial performance (Wolfe & Sauaia 2003).

The findings are consistent with the theoretical proposition that hedging improve the financial performance of a firm. This findings corroborates with previous empirical studies which found that general hedging enhances the financial position and hence the value of the firm. Bartram, Brown and Fehle (2004) found evidence that, the use of general derivatives has a positive effect on the value of the firm. The result also consistent with findings that that natural (operational) hedging techniques increase profits and reasonably reduce the downside foreign exchange risk (Dong, Kouvelis & Su 2014).

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

The second 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_{02}) stated that there is no 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, 2012). 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) are 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 5.3 below.

Table 5.3: Regression Results of FERH 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 chi2(1)	= 7.120
			Prob > chi2	= 0.008
	Coefficients.	Bootstrap Std. Err.	Z	P>/z/
Forex risk Hedging	3.596	1.595	2.250	0.024
_Cons	1.192	1.437	0.830	0.407

Source: Research Data, 2018

From table 5.3, the results show a significant model with Wald statistic ($\chi^2 = 7.120$, p-value = 0.008) and p-value 0.045 implying significance of the effect of currency hedging on financial performance.

The second step, model two, the moderating variable, corporate governance 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 uses 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 5.4 below.

Table 5.4: Likelihood Ratio Test between Model 1 and Model 2

Likelihood-ratio test		LR chi2(1)	=	97.73		
(Assumption: Model 1 nested in Model 2)		Prob > chi2	=	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

Source: Research Data, 2018

From table 5.4, 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, model three, 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 5.5 below.

Table 5.5: Likelihood Ratio Test between Model 2 and Model 3

Likelihood-ratio test		LR chi2(1)	=	39.71		
(Assumption: Model 2 nested in Model 3)		Prob > chi2	=	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

Source: Research Data, 2018

The results in table 5.5 above, show that the AIC and BIC of model three, is less than that of model two, indicating 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 5.6: 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 chi2(3)- Model 3	=	1304.8
			Prob > chi2 - Model 3	=	0.000

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

Source: Research Data, 2018

Table 5.6, 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 of 0.000, which is less than 0.05. The coefficient of the interaction variable has a significant influence on financial performance ($\beta = -0.043$, $Z = -12.970$, p-value = 0.000). 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.

$$Y_{it} = 0.102X_{it} + 0.057Z_{it} - 0.043XZ_{it} + \mu_{it} + \epsilon_{it}$$

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. Therefore, the null hypothesis was rejected and the analysis assisted in a conclusion drawn 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.

5.2.3 Joint Effect of Foreign Risk Hedging and Corporate Governance on Financial Performance

The joint effect of the independent variable, moderation of corporate governance was assessed using a multiple regression model, including all the variables as predictors. The results are shown in table 5.7 below.

Table 5.7: Joint Effect of FERH, Corporate Governance and Financial Performance

Coefficients: generalized least squares

Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.8598)

Estimated covariances	=	1485	Number of Obs	=	324
Estimated autocorrelations	=	1	Number of groups	=	54
Estimated coefficients	=	2	Time periods:	=	6
			Wald chi2(2)	=	1128.97
			Prob > chi2	=	0.000

	Coefficients	Bootstrap Std. Err.	Z	P> z
Forex Hedging	0.021	0.011	1.986	0.047
Corporate governance	0.035	0.002	21.260	0.000

Source: Research Data, 2018

Table 5.7, above, shows the results of the multiple regression model to assess the joint effect of foreign exchange risk hedging and corporate governance on performance. The model fitted is statistically significant as shown by the Wald Chi-square statistic of 1128.97, with a p-value of 0.000, which is less than 0.05 which implies that foreign exchange risk hedging and corporate governance have a significant joint effect on the performance. The coefficient estimates of both Foreign exchange risk hedging and that of corporate governance are also shown to be significant. The p-value of the estimate of the influence of forex hedging on financial performance ($\beta = -0.043$, $Z = -12.970$, $p\text{-value} = 0.000$) is less than the 0.05 level of significance. The coefficient estimate of corporate governance ($\beta = 0.035$, $Z = 21.260$, $p\text{-value} = 0.000$) also has a p-value less than 0.05. This confirms that both forex hedging and corporate governance had a significant effect on performance. The equation generated from the model is given below.

$$Y_{it} = 0.021X_{it} + 0.035Z_{it} + \mu_{it} + \varepsilon_{it}$$

5.2.4 Summary of Findings

After studying the effect of foreign exchange risk hedging techniques and corporate governance on the financial performance of listed firms, the study made the following findings. The first objective was to determine the effect of foreign exchange risk hedging techniques on the financial performance. 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 analyzed by fitting panel effect data models. Thus the null hypothesis, (H_{01}) was rejected.

The second 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 also showed that corporate governance influence 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, that is; 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 and corporate governance on the financial performance was significant. The results revealed that there was a significant joint effect of currency hedging 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 and corporate governance have a significant joint effect on financial performance of listed firms in Kenya.

6.0 Conclusions and Recommendations

Theoretically, there exists a relationship between hedging and financial performance of listed firms. This study therefore confirmed that currency risk hedging techniques have a positive effect on financial performance. The results also indicated that corporate governance moderates the relationship between currency hedging and financial performance. Lastly, the results also revealed that there was a significant joint effect of hedging and corporate governance on the financial performance of the firms.

The findings of the study have various implications on risk management policy and practices. First, the study confirmed a positive effect of foreign exchange hedging techniques on financial performance. The study found out that majority of listed Kenyan firms use natural hedging, like borrowing in foreign currency, which does not involve financial institution. The financial derivatives are not widely used because the derivative market is not well developed. Since the early 2000s, the Nairobi Securities Exchange (NSE) and the market regulator, Capital Markets Authority (CMA), endeavored to introduce and develop the Futures and Options Market Segment (FOMS). The progress has, however, been very slow. 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 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 endeavor to strengthen the 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.

Third, the results confirmed that the joint effect of exchange hedging techniques 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 and strengthen corporate governance. 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 instruments. In Kenya, the dearth of such instruments inhibits innovativeness surrounding risk management.

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