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Effects of Derivatives on Financial Performance of Firms Listed at the Nairobi Securities Exchange

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Abstract:

Derivative markets have changed overtime from trading with simple contracts to very advanced financial instruments. The benefits and costs of derivatives on the financial performance of listed firms remains the subject of debate. This study, therefore, sought to establish the effect of derivatives on the financial performance of firms listed at the Nairobi Securities Exchange. The study targeted all 62 firms listed at the NSE as at 31st December 2016. A questionnaire was used to collect primary data. The study applied both descriptive and inferential statistics to analyze collected quantitative data. The study used Statistical Package for Social Sciences (SPSS version 22) for analysis. Return on Assets (ROA) was used as the proxy for financial performance while risk management, efficiency in trading, price stabilization and price discovery were the predictor variables. The findings of the study indicated that there is a significant relationship between the financial performance (ROA) of firms listed at the NSE and derivatives. Additionally, the positive nature of the relationship means that a unit change /increase in derivatives will result to an increase in financial performance of firms listed at the Nairobi Securities Exchange. This study recommends that listed firms put in place adequate risk measuring systems and appropriately create structured limits on risk taking. Consequently, derivatives should also be properly used in a manner that is instrumental to the goal of a firm.

Keywords: *Derivatives, financial performance, risk management, efficiency in trading, price stabilization and price discovery*

1. Background of the study

Derivatives are financial instruments whose values are derived from the values of other basic underlying assets such as stocks, bonds, real-estate property, rates or other variables (Stulz, 2005). The common financial derivatives used are futures, forwards, and options and swap contracts. In the global market, Bartram, Brown, and Conrad, (2011), on a survey of non-financial firms from 47 countries found out that the use of these instruments reduced firm's total risk that is mostly experienced in firms with higher exposures to interest rate risks, exchange rate risks and commodity prices risks. In United States, 83% of hedging firms use forward agreements, futures contracts, options or swaps to hedge foreign exchange risk, 76% use them to hedge interest rate risk and 56% use them to hedge commodity price risk, (Bodnar, G.M., De Jang, A. & Macrae, V., 2003)

According to some of the studies done in the African region, South Africa uses derivative instruments only on short term contracts which include futures, forwards and swaps (Minnit, Goodwin, & Stacey, 2007); (Sivakumar & Sakar, 2011). Osuoha (2010) identified the need for derivatives to increase market depth in Nigerian financial markets. Present Nigerian capital and money markets are lacking in hedging mechanism to protect investors.

In Kenya, The Nairobi Securities Exchange recently received the green light from the Capital Markets Authority to start issuing and trading derivative contracts on its derivative market known as Next. Ochieng and Ntoiti (2016) analyzed effect of foreign hedging practices on financial performance of non-financial firms listed at the Nairobi Securities Exchange. The study findings indicated that employees were concerned about the financial performance so as to enhance the whole organization's performance.

1.1. Statement of the Problem

A thin line exists between the usage of derivatives in hedging and speculation. While it is widely appreciated that hedging is necessary in managing financial risks, some finance managers may venture in speculative behaviour which exposes the firms to more risks. In 2015, two local giant firms, Kenya Airways and Uchumi Supermarkets reported 25.7 billion shillings and 262.3million shillings losses respectively which were associated to lack of proper hedging practices (Kiio, 2017). Losses incurred by Kenya airways since 2014 have been partly blamed on the use of fuel derivatives to protect against sudden increases in oil prices. The airline has however made massive profits from use of derivatives in the past (Kiragu, 2015). The benefits and costs of derivatives on the financial performance of listed firms remains the subject of debate. This study sought to establish the effect of derivatives on the financial performance of firms listed at the NSE.

Tanui (2015) conducted a study on the determinants of corporate hedging practices used by companies listed in the Nairobi Stock Exchange (NSE). Wekesa (2012) conducted a study on relationship between foreign exchange risk management and profitability of airlines in Kenya and found out that airlines fully hedged using forwards, futures and money markets concluding that there was a positive relationship between foreign exchange risk and the hedged positions. There is limited literature on the impact derivatives have on the financial performance of listed firms. This research therefore, sought to establish and fill the research gap on the effect of derivatives on the financial performance of firms listed at the NSE.

1.2. Objectives of the Study

1.2.1. General Objective

The overall objective of the study was to establish the effect of derivatives on the financial performance of firms listed at the NSE.

1.2.2. Specific Objectives

The specific objectives of this study were to:

- To examine how risk management in derivatives affects the financial performance of firms listed at the Nairobi Securities Exchange in Kenya.
- To examine how efficiency in trading of derivatives affects the financial performance of firms listed at the Nairobi Securities Exchange in Kenya.
- To establish the extent to which price stabilization affects the financial performance of firms listed at the Nairobi Securities Exchange in Kenya.
- To determine the extent to which price discovery affects the financial performance of firms listed at the Nairobi Securities Exchange in Kenya.

2. Literature Review

2.1. Theoretical Framework

The usage of derivatives and its linkage to financial performance has a theoretical underpinning.

2.1.1. Agency Theory

Agency theory by Jensen and Meckling (1976) provides a justification for the use of derivatives. This theory viewed debt as one way to minimized agency costs and as a monitoring mean. Agency costs arise when managers have different goals than the goals of the owner and as they pursue their goals the owner's stake might be affected which will lead to a conflict between the owner and managers. They called this conflict principle-agent conflict. This theory informs the current study in that it is obvious that capital structure and hedging suffer from an endogenous problem, Borokhovich, K. A., Brunarski, K. R., Crutchley, C. E., & Simkins, B. J. (2004) This means that the derivatives' role in capital decisions is more complex than it was considered (Bartram, S. M., Brown, G. W., & Fehle, F. R., 2009).

2.1.2. Modigliani-Miller Theory

The theory was advanced by Franco Modigliani and Merton Miller in 1958. Soon after its publication, the M&M theory was transformed into the main theory of the capital structure (Pan, 2012). According to miller, derivatives are unusually successful and principal instrument in the management of risk, whether this risk is connected with fluctuations in securities prices, interest rates, commodity prices or foreign exchange rates. Risk management improves a firm's financial performance. Derivatives enable risk to be transferred from those wishing to protect themselves against it, to those willing to undertake greater risk. This solution conforms to the market completely and is a further phenomenon of its self-regulatory abilities.

2.1.3. Economic Theory of Agency

The economic theory of agency was proposed by Ross (1973). The theory assumes that managers act in the interest of internal shareholders. In modern corporations, however, there is separation between ownership and control. The economic

theory of agency covers these conflicts of interests between managers and shareholders as well as methods to mitigate them. Risk aversion of managers causes economic agency problems since managers may not pursue the value maximising investment and financing policy just in order to reduce the total risk of the company. Hedging can mitigate economic agency costs because a reduction of financial risk minimizes the manager's exposure and, therefore, the risk that he employs a suboptimal investment and capital structure policy.

2.2. Empirical Review of Variables

Bartram et al. (2011) suggest that through financial risk management with derivatives, firms can reduce cash flow risk, total risk, and systematic risk significantly. In their study they tried to find out the effects of different types of derivative uses on firms risk as well as how access to derivatives market impact on firms. Jin and Jorion (2006) and Bartram, Brown, and Conrad (2011) find strong evidence that derivatives reduce a firm's risk and stock price volatility.

Bartram et al. (2011) also found that non-financial firms that use derivatives significantly outperform those that do not use derivatives during the period covered in the study (2000-2002). Osuoha (2009) identified the advantages that derivatives market can bring into a firm to include lower transaction cost, better liquidity, faster and easier transaction, possibility of short selling and achieving greater leverage.

Chanzu and Gekara (2014), the proponents of 'Market completion' hypothesis argued that the introduction of futures in the market actually reduces the spot market volatility and thereby, stabilizes the stock market. Ouma (2016), conducted a study conducted to analyze the effect of foreign exchange rate volatility on horticultural earnings. Using regression analysis found out that the results are indeed positive which was rather likely.

Barclay, Michael, Hendershott, Terrence, (2008) compares trading and non-trading mechanism for price discovery during NASDAQ pre-open and examines whether prices are discovered through trading. As Nada pre-open trading volume increased, the opening price became more efficient and price discovery shifted from the opening trade to pre-open. Price discovery shifted from the trading day to pre-open only for the best volume stocks. These results suggest that Pre-open trading contributes to the efficiency of opening price, but that a critical threshold of trading volume is required to increase the amount of information on the opening price.

3. Research Methodology

In this study, descriptive research design was used to achieve this by describing the data and characteristics about derivative trading. That is, it was used to find out the current state of the financial performance of firms listed at the NSE, their level of involvement in financial risk management, efficiency in trading, price stabilization and price discovery.

The target population comprised of 62 firms listed at the NSE for the period 2016. A census of all the firms was conducted. Open and closed ended questionnaires were used to collect primary data. To estimate internal consistency reliability Cronbach's alpha method was used. Tests for the internal reliability of the factors in each category were conducted by determining their Cronbach's coefficient α value. Cronbach's α values of 0.50 to 0.70 are acceptable.

Statistical Packages for Social Sciences (SPSS) was used by for data analysis. The results obtained were presented by the use of pie charts and tables for easy interpretation. Inferential statistics including ANOVA table and regression analysis were used to interpret the data and test its reliability and validity. A simple regression model was used to assess the effects of independent variables on the dependent variable.

The regression equation was;

$$Y = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

Where: β_0 is the constant of the regression model.

Y = Performance of Firms listed in NSE

β_0 = Constant.

X_1 = Risk Management

X_2 = Efficiency in Trading

X_3 = Price Stabilization

X_4 = Price Discovery

b_1, \dots, b_4 = Regression Coefficients

4. Research Findings and Discussion

Table 4.1 below shows the number of questionnaires distributed and the number of questionnaires returned from the respondents including their percentage response rate.

Respondents	Questionnaire Distributed	Questionnaire Returned	Response Rate
	62	55	88.7%

Table 4.1: Response Rate

4.1. Reliability Analysis

The Item analysis was conducted for all items (statements) in the questionnaire that were summated into scores for the 5 factor categories. For each factor Cronbach's coefficient α was calculated and a factor analysis specifying a one factor model was conducted. Cronbach's α value for all factor categories were $> .70$, which is regarded as adequate proof of internal consistency. It should be noted that Cronbach's α values of 0.50 to 0.70 are acceptable.

Variable	Cronbach's Alpha
The risk management	.83
Efficiency in trading	.80
Price stabilization	.82
Price discovery	.77
Financial performance	.89

Table 4.2: Reliability Analysis

4.2. Descriptive Statistics of the Study Variables

Financial performance was evaluated using the Return on Assets (ROA) whose descriptive statistics are presented in table 4.3. The maximum score was 0.534 indicating that the best performing company reported a return on assets of 53.4% which may be considered very high.

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	55	-0.045	0.534	0.109	0.112
Valid N (list wise)	55				

Table 4.3 Descriptive Statistics of Financial Performance (ROA)

The first objective of the study was to find out how the risk management in derivatives affects the financial performance of firms listed in NSE. The study used a close ended questionnaire to collect data on risk management. The results showed that the mean score for all questions is between 4 and 5 implying that the respondent agreed to the statement posed.

The study used a close ended questionnaire to collect data on efficiency in trading. A five-point Likert scale was used with scores of 1 to 5, 1 being strongly disagree and 5 being strongly agree. The data was coded and descriptive statistics generated. The results showed that the mean score for all questions is between 4 and 5 implying that the respondent agreed to the statement posed.

The study used a close ended questionnaire to collect data on price stabilization. A five-point Likert scale was used with scores of 1 to 5, 1 being strongly disagree and 5 being strongly agree. It is evident in the first, second and the fourth statements, all scores were selected indicating the existence of heterogeneity. However, the average score for all statements was between 4 and 5 implying that the respondent agreed to the statement posed.

The fourth objective of the study was to determine if price discovery affects the financial performance of firms listed at the Nairobi Securities Exchange in Kenya. The study used a close ended questionnaire to collect data on price discovery. The average score for all statements was between 4 and 5 implying that the respondent agreed to the statement posed.

4.3. Regression Analysis

Regression Analysis was carried out for focus on the risk management, efficiency in trading, price stabilization and price discovery and financial performance. To test for the relationship that the independent variables have on financial performance, the study used the multiple regression analysis. The results for the model summary are provided in table 4.5.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859 ^a	.738	.717	.05604

Table 4.4 Model Summary

A. Predictors: (Constant), Risk Management, Efficiency in Trading, Price Stabilization, Price Discovery

In order to assess the significance of the whole model, analysis of variance (ANOVA) was carried out. The results of the study are in table 4.6. The results show that the model is statistically significant given the level of significance 0.000 which is below 0.05 ($P < 0.05$).

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.443	4	.111	35.241	.000 ^b
Residual	.157	50	.003		
Total	.600	54			

Table 4.5 ANOVA

A. Dependent Variable: Financial Performance

B. Predictors: (Constant), Risk Management, Efficiency in Trading, Price Stabilization and Price Discovery

The regression coefficients as per the SPSS equation generated:

Model		Unstandardized Coefficients		Standardized Coefficients		sig.
		B	Std. Error	Beta	T	
	(Constant)	0.091	0.03		3.033	0.000
	Risk Management	1.290	0.380	.376	3.394	0.001
	Efficiency in trading	0.216	0.079	.221	2.723	0.009
	Price stabilization	0.285	0.047	.538	6.017	0.000
	Price Discovery	-0.127	0.051	-.250	-2.493	0.016

Table 4.6 Regression Coefficients

A. Dependent Variable: ROA

As per the SPSS generated table above, the equation

$(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon)$ becomes:

$$Y = 0.091 + 1.290X_1 + 0.216X_2 + 0.285X_3 - 0.127X_4 + \epsilon$$

The regression coefficients show that a unit increase in risk management led to an increase in ROA by 1.290 units. Likewise, a unit increase in efficiency in trading led to an increase in ROA by 0.216 units. A unit increase in price stabilization led to an increase in ROA by 0.285 units. On the contrary, a unit increase in price discovery led to a decrease in ROA by -0.127 units. From the findings above, there exists a direct relationship between the independent variables risk management, efficiency in trading, price stabilization and price discovery and the dependent variable which is financial performance since the p values for all the four variables are less than the significance level of 0.05.

5. Summary, Conclusions and Recommendations

When the analysis of the relationship between risk management on financial performance of firms listed in NSE was carried out, derivatives were found to have a positive correlation with ROA meaning that an increase in derivatives resulted in a corresponding increase in financial performance. The results implied that there exists a direct relationship between the efficiency in trading achieved through the use of derivatives and the financial performance of firms listed at the NSE. The results showed that majority of the respondents agreed that transaction costs affect trading of derivatives of the firm.

The results show that there exists a direct relationship between price stabilization achieved through the use of derivatives and on the financial performance of firms listed at the NSE. The findings showed that the respondents agreed that volatility of prices in the market influence the usage of derivatives and minority of the respondents agreed that the volume of activities of their company influences the usage of derivatives. The study sought to explore if price discovery in derivatives affects the financial performance of firms in Nairobi Security Exchange. The results show that there exists a negative relationship between the efficiency in trading achieved through the use of derivatives and on the financial performance of firms listed at the NSE.

The findings about how financial performance is affected by derivatives are mixed and this is probably because it is not easy to differentiate in practice hedging and speculating derivative activities. The correlation coefficients showed that apart from price discovery, all other independent variables contribute positively to the dependent variable. The contributions are all statistically significant as the p-values are less than .05 (Sig. = .000), except for price discovery stabilization which is statistically insignificant (Sig. > .05).

This study recommends that listed firms put in place adequate risk measuring systems and appropriately create structured limits on risk taking. The study further recommends that the Capital Markets Authority require disclosure of the value and type of derivatives used by firms listed at the Nairobi Securities Exchange. This study therefore recommends that before any firm that undertakes hedging with derivatives, it should first consider its finance cost and other elements of debt capital. Failure to do this may result in fatal losses to the firms involved.

The researcher recommends that studies be carried out on other factors that may affect the financial performance of a firm other than those included in this study. Research should also be conducted incorporating a longer period exceeding the 1 year that was used in this study. Further, another study should be done to establish why price discovery has a negative correlation with financial performance.

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