IOSR Journal of Economics and Finance (IOSR-JEF)
e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 6, Issue 6. Ver. III (Nov. - Dec. 2015), PP 18-27
www.iosrjournals.org

Firm Value and Derivatives Use: Evidence from Nairobi Securities Exchange

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Abstract: *The objective of this study is to explore the influence of firm value on use of derivatives among companies listed at the Nairobi Securities Exchange. Data for this study was obtained through analysis of disclosures in annual reports of quoted companies. Univariate analysis and multivariate analysis with logistic regression was conducted on variables obtained through analysis of past literature. The basic hypothesis of the study was to test whether there is statistical significance to support Market to Book Value Ratio, Tobin Q and Book Value of Sales as proxies for Firm Value. Market to Book Value Ratio and Tobin Q were found to be insignificant. Book Value of Sales proved significant in the analysis. This study concludes that there is inconclusive evidence on firm value as determinant of derivative use. However, the desire to increase Sales is a determinant of derivative use among firms quoted at the Nairobi Securities Exchange. This paper contributes to the debate on the introduction of derivative trading in the Kenyan Securities Exchange.*
Key Words*: Derivatives, Firm Value, Tobin Q,*

I. Introduction

Firm value maximization is at the centre of firm's risk management activities. Value maximization drives the quest for new investment and entry into new markets and also drives the employment of new efficient systems. The central objective of management is to maximize firm value and hence the shareholder interest. One aspect of firm value maximization is to manage firm risk and the use of derivatives is one method of managing risk. If risk level is reduced firms can enhance their turnover through international trade, increase their asset base and hence their market value.

Risk is an inherent component of business, which leads to volatility of expected future cashflows. Businesses are exposed to risks from their operations and environment. Financial risk emanates from everyday transactions of a business is engaged and introduce uncertainty into the receipt and magnitude of future expected cashflows. There are three main forms of financial risk that a company can be exposed to from external sources; interest rate risk, foreign exchange risk and commodity prices risk (Froot et. al 1994). Interest rate risk originates from the volatility of future interest rates therefore increases the fixed charge and debt liability of a company. The probability of changes of interest rates increasing suddenly is a very real for Kenyan companies having experienced interest rate changes in the recent past. Borrowing rates had changed from as low as 13% to as high as 16% following the Central Bank of Kenya intervention in the markets in 2011.

Foreign exchange risk is the risk of appreciation or deprecation of one or more currencies that a company is exposed to, either increasing the cost of products or services or eroding the value of earnings. Companies that trade in the international markets are especially exposed to foreign exchange risk. Globalization and international trade have made this particular risk relevant. The foreign exchange risk affects earnings expected from operations in a foreign country in foreign currency where the earnings have to be repatriated to the home country. Kenyan companies in South Sudan are exposed to foreign exchange risk since the South Sudan pound has been falling against both the Kenya Shilling and the Dollar.

Commodity Prices risk is the risk of fall or rise of the prices of commodities in the international market. Oil Companies, Tea Companies, Gold Mining and other metal dealers are specially exposed to foreign exchange risk. The risk of price changes of commodities affects producers, resellers and consumers differently and on any end of the spectrum one party is exposed to the risk of reduced or complete wiping out of future cashflows.

Corporate management entails the management of risks using various tools. Traditional tools of risk management includes establishing branches approach, leading and lagging were prevalent in the past. New tools were developed in the 1970s in the form of derivatives. A derivative is a financial contract that derives its value from an underlying financial asset, instrument or an economic good (Stulz 2004). Derivatives are a significant component of the global economy, with notional market size exceeding $700 trillion (Bartram et al. 2009.) The principle working of derivatives is that they transfer risk from those who do not want to bear it to those who want to be exposed to the risk. The basic types of derivatives also called plain vanilla derivatives are forward

contracts, futures, options and swaps. Financial engineering has come with numerous variations of these derivatives.

While there has been an explosion of derivative use in the developed world, sub-Saharan Africa has not experienced the emergence and growth of a derivative exchange except in South Africa. In Kenya OTC derivative contracts are transacted through local banks. Currency forwards deals are common among commercial banks on the overnight borrowing window. Currency options are not so common (Oloo 2011). The Nairobi Securities Exchange has been implementing a demutualization drive which will among others lay down the necessary regulatory framework for the introduction of exchange-traded derivative.

Risk management through hedging has been controversial among scholars since the widespread adoption of derivatives as hedging tools. The point of contention has been the motive for hedging against risk and the relevance of management actually engaging risk management activity. Capital Asset Pricing Model contends that unsystematic risk is irrelevant, only systematic risk is a threat to investors who hold diversified portfolios (Sharpe 1964, Linter 1965, Mossin 1966). MM Theory which considers balance sheet activities of companies as irrelevant also agrees with CAPM. However, market imperfections can be used to explain why management should bother itself with risk management. The assumption underlying the irrelevance theories is that of perfect markets where investors can engage in their own risk management activities including diversification and activities.

The basic conflict in this area is, does the use of derivatives enhance firm value? The proposed introduction of derivatives in the Nairobi Securities exchange will only benefit companies if risk management suing derivatives is a value enhancing activity for the firms. Derivative trading activity itself is a profitable venture for fund managers and other speculation specialists and this itself may strengthen for the introduction of risk management at the bourse.

This study delves in the usage of derivatives and firm value among firms listed at the Nairobi Securities Exchange. Data for this study is collected form publicly available annual records. It is a regulatory requirement that firms disclose their risk exposure and risk management strategies including financial instruments held in their financial reporting. Extensive review of existing literature incorporating the latest papers available on the subject reveals the various variables that can be tested by appropriate hypotheses. The study employs both univariate employing independent t-test of means and multivariate analysis using logistic regression.

This study contributes to the existing body of knowledge on derivative usage and tests the known variables under the environment of the Kenyan markets. The study provides a point of reference for further research into hedging and derivatives among firms at the Nairobi Securities Exchange. Through analysis of five year annual reports, the study also provides a definitive answer to the question of usage derivatives in the Kenyan market by providing the evidence of usage of such instruments.

1.1 Statement of the problem

Firms use derivatives for risk management purposes globally. Quoting various studies over the years Ahmed and Haris (2012) come up with enormous statistics of: 53.1% in New Zealand (Berkman, Bradbury and Magan, 1997), 61% of Fortune 500 S&P 500 firms in the United States (Howton and Perfect, 1998), 60% in the Netherlands (Bodnar, de Jong and Macrae, 2003), 59% in Sweden (Alkebäck, Hagelin, and Pramborg, 2006), 67% in U.K. (El-Masry, 2006), 78% in combined dataset of Hong Kong and Singapore (Sheedy, 2006), 61.6% in Denmark, Finland, Iceland, and Sweden (Brunzell, Hansson and Liljeblom, 2009) and 38% of all derivatives traded globally in the Asia Pacific.

This statistics are mainly in Europe and Asia leaving Africa with little or no information on the usage of derivatives for risk management with the exception of South Africa. A survey by Correia, Holman, and Jahreskog (2012) in South Africa sampling large listed South African non-financial firms found that 90% of respondents used derivatives. Kenya is an important financial hub in Africa and talks are currently underway to create a futures market and allow exchange-traded derivative to be introduced in the market. Over-The-Counter private derivative contracts with banks are fairly common in Kenya in specific sectors (Tanui 2008). Major studies on the subject have sidestepped the firm value maximization as a determinant of derivatives use by Kenyan companies. Studies in Kenya focus mainly on factors influencing the development of financial derivatives (Ngugi et al 2013). Therefore there is a latent gap in research to establish if firm value is a determining motive for derivative among firms listed at the Nairobi Securities Exchange. This study provides an initial at attempt at filling this gap.

1.2 Objectives

The objective of the study us to determine if firm value is a factor in the decision to use derivatives among firms listed at the Nairobi Securities Exchange.

1.3 Hypothesis

H_0: Firm Value has no influence on a firm' derivative use
H_0: Firm Value has influences on a firm' derivative use

II. Literature Review

2.1 Theoretical Review

In a Modigliani and Miller environment of perfect markets with no taxes, no contracting costs, no information asymmetry and no capital market imperfections, risk management using derivatives is irrelevant. Risk management would only be relevant to manage market imperfections and relaxing the MM assumptions. Firms engage in management of risk to protect their future cashflows against variations. This objective informs the hedging practices of any firm (Froot, Scharfstein & Stein, 1993). Literature in this area is mainly divided into three competing theories attempting to explain the rationale for use of financial derivatives: value maximization, managerial utility maximization or speculative trading.

According the theory of value maximization, management of financial risk maximizes firm value through; reduction of expected taxes, reduction of financial distress costs, mitigation of underinvestment problem and enabling a firm to increase its debt capacity and obtain debt tax-shield (Bessembinder, 1991). The overall objective is reduction of cashflow volatility and enhancement of present value of future cashflows hence maximization of shareholder wealth. Using derivatives for hedging risk therefore reduces the expected tax obligations at the point where the marginal tax for the firm is convex. Reduced tax obligation retains cashflows within the firm and increases firm profitability. This leads to enhanced firm value (Smith & Stulz, 1985). Financially distressed firms face various costs including bankruptcy and reorganization costs. Hedging reduces the deadweight cost of financial distress. Underinvestment problem is the conflict between equity holders and bondholders and was first analyzed by Myers, (1977). This is an agency problem where equity holders may reject positive NPV projects because significant amount of the cashflow from project will flow to the bondholders rather than equity holders. Bondholders understand these and they factor it into bond prices. If the firm has growth opportunities where external financing is more expensive than internally generated funds, hedging with derivatives enhances the availability of internally generated funds for the existing investments (Froot, Scharfstein, & Stein, 1993). According to Leland, (1998), firms hedge to increase debt capacity which increase the firms leverage leading to interest tax shield advantages. In an increasing debt environment equity holders lose value to bondholders but increased debt creates interest tax shield which more than offsets any value lost to bondholders. Firm value is enhanced by reduced tax obligations through debt tax shield.

Alternatively, In support of agency theory, the second theory suggests that managerial risk aversion may lead managers to use derivatives to management risk with the main objective of protecting their personal wealth tied in the firm with no regard to shareholder wealth maximization (Stulz, 1984; Smith & Stulz, 1985). Risk averse managers will have higher propensity to hedge if their capital and wealth are tied up in the firm. Proponents of this theory contend that available evidence does not support the maximization of shareholder wealth but supports the managerial utility function. Essentially, this body of work follows on the CAPM assumption that the only relevant risk is systematic risk. CAPM suggests that investors are perfectly capable of managing unsystematic risk through diversification. Investors do not place any premium on the firm's effort in managing unsystematic risk.

Under very different assumptions from risk management perspectives, firms also employ derivatives for speculation purpose which is a different objective from shareholder wealth maximization (Geczy, Minton, & Schrand, 2007). The objective of speculation is to earn arbitrage income for the firm, which increases the revenue lines of the firm. Financial firms especially banks engage in speculation with currency derivatives in order to profit from exchange differences. Shareholders support speculation if adds to the profitability of the firm. For speculation to be effective the firm must have either superior information unavailable to other market participants or use volume of trade to achieve economies of scale. Arbitrage income from speculation is not possible in perfect markets where information is readily available and costless.

2.2 Empirical Review

The empirical review examines the various studies based on identifying firms that hedge with derivatives and determinants of hedging with derivatives identified by research. According to Triki, (2005), testing of corporate hedging theories using financial derivatives presented three main challenges to researchers; Identification of hedgers in the population considered, measurement of corporate hedging and identification of determinants of derivative use.

Identification of firms that use derivatives posed challenge to researchers over the years. Triki, (2005), identifies three possible approaches used by researchers over the years: use of survey results, use of keyword search of databases and use of private information. The use of survey was the first research design applied by scholars in the field in the United beginning 1995. Block & Galagher, (1986), were among the first to identify

hedgers using a survey of firms in the US. Other researchers followed with the survey being sharpened and applied across industries and countries. The famous Wharton Survey became a standard approach by researchers to gauge the level of derivative usage in various countries (Bodnar, Hayt, Martston & Smithson, 1995). Surveys were carried out in various countries over the years in New Zealand (Berkman, Bradbury & Magan, 1997), Netherlands (Bodnar, de Jong & Macrae, 2003), Sweden (Alkebäck, Hagelin, & Pramborg, 2006), U.K. (El-Masry, 2006), Hong Kong and Singapore (Sheedy, 2006), and Denmark, Finland, Iceland, and Sweden (Brunzell, Hansson & Liljeblom, 2009). Surveys were however shown to suffer from non-responsive bias with hedgers having more incentive to respond than non-hedgers. Surveys also introduce noise into the analysis through sampling bias. According to Haushalter (2000) respondent firms had higher asset values than non-respondent firms. Surveys also had varied approaches and little comparability of various studies.

The second approach in identifying hedgers is the use of keyword search of databases and use of databases of derivative users. This approach was developed once data especially company annual reports was available in databases of governments and regulatory authorities. Many important studies were based on this approach (Howton & Perfect, 1998; Nguyen & Faff, 2003; Modak, Holman & Correia, 2012; Geczy Minton & Schrand, 1997). However, the initial problems with the use of databases were that derivative usage is an off-balance sheet transaction and firms were at liberty to disclose their use of derivatives. The information obtained therefore was based on voluntary disclosure which risked identifying hedgers as non-hedgers on the basis of non-disclosure. The quality of information has improved over the years. Standards of reporting have adopted a mandatory disclosure of risk management techniques. Companies must now disclose not only the risks they manage but financial instruments they use and the magnitude of their disclosure according to IFRS 39 and IAS 7. Modak, Holman & Correia (2012) analyzed the annual reports of the 100 largest South African companies and concluded that over 90% of the firms used derivatives.

In some cases identification of hedgers was based on specialist private information. Many of the studies carried on Gold mining firms in North America were based on private data provided by Ted Reeve (Triki, 2005). Gold mining being a specific industry with peculiar characteristics provided researchers with away to provide industry differences in the characteristics of derivative usage (Tufano, 1996; Dionne & Garand, 2003; Brown, Crab & Haushalter, 2003). This study employs analysis of annual reports for 2008, 2009, 2010, 2011 and 2012 of the firms listed at NSE.

Empirical research has concentrated mainly on two rationales for hedging with derivative for purpose of risk management; either hedging is employed to increase the value of the firm or to enhance managers' utility function. For hedging to increase firm value it should reduce the volatility of cashflows by reduction of tax payable, reducing costs of financing and financial distress, reduction of agency costs and reduction of the underinvestment problem (Stulz, 1984). The determinants for use of derivatives in this case therefore are presence of convex tax regime, debt, underinvestment problem, growth opportunities, managerial ownership and the size of the firm (Nguyen & Faff, 2002). This theory of risk management was tested by empirical research with mixed results.

Empirical literature has examined firm's propensity to hedge with derivatives from different perspectives. Few studies have directly measured the impact of the use of derivatives on firm value (Allayannis & Weston, 2001; Guay & Kothari, 2003; Jin & Jorion, 2006; Mackay & Moeller, 2007). Several studies examine if usage derivatives is consistent with existing theories of risk management with derivatives (Tufano, 1996; Geczy, Minton, & Schrand, 1997; Haushalter, 2000; Graham & Rogers, 2002). Limited number of studies have examined whether derivatives are used for speculative purposes by non-financial firms (Geczy, Minton, & Schrand, 2007). Other researchers have focused on whether the use of derivatives impacts on firms' common risk factors such as Tax, Size, leverage, liquidity, and growth opportunities predicting derivatives use (Donohoe, 2012a; Sprcic, 2007; Guay, 1999; Allayannis & Ofek, 2001; Bartram, Brown & Fehle, 2009).

Empirical literature in this area identifies various determinants of derivative use. Firm value is in many cases treated as an endogenous variable and is not considered as a determinant of derivative use. Since firm value can be directly measured by several variables chief of which is the Tobin Q ratio, it is rational to include it as a determinant of derivative use (Tufano, 1996). Including firm value as a determent will take care of incremental values which on their own may appear statistically insignificant but may become significant once they add up. The presence of debt, tax incentive, underinvestment and growth opportunities and managerial ownership in the firm are considered as the determinants of derivative use (Nguyen & Faff, 2002). Industry and Firm characteristics affect the firm's decision to hedge. Firm size is a mediating variable that either increases the propensity to hedge or not to hedge with derivatives. The industry in which a firm operates also affects the propensity to use derivatives. Extractive industries like oil and gas are more likely to hedge than other industry. Firms in international trade are more likely to be exposed to foreign exchange risk as well as international markets where derivative instruments are traded.

Finance theory assumes that the central objective of risk management to increase firm value and in effect increase shareholder value. Employing derivatives in risk management should therefore support this

theory. If hedging with derivatives directly it affects various variables that affect firm's profitability and cashflows. This can be achieved either by increasing total asset value, increasing the market value or enhancing the total sales. Various studies used different proxies to measure firm value. There are four main proxies evident in relevant studies; Tobin Q, Market to Book Value, Book Value of Assets and Book Value of Sales. Bartram, Brown & Conrad, (2011), carried out an extensive research using a large sample of 6888 non-financial firms in 47 countries. Their study applied multivariate analysis matching derivative users against non-derivative users and adjusting for bias. Using Tobin Q as measurement of firm value, they concluded that hedging reduces both total risk and systematic risk. This is a marked deviation from the bulk of literature that shows either minimal benefit to the firm or no value enhancement in derivative usage. Naito & Laux, (2011) studied 434 non-financial firms using Tobin Q to represent firm value and conclude that there are no statistically significant results demonstrating that derivative use enhances firm value. The study employed the notional value of derivatives disclosed in financial statements to identify hedgers from non-hedgers. Notional values of derivatives represent the total amount of derivatives at any particular time theoretically. Practically however firms with short and long position in a particular instrument may report zero notional value, since the two positions net off.

Allayannis & Weston (2001) studies 720 large US non-financial firms between 1990 and 1995 find a positive relation between firm value and use of foreign exchange derivatives. Using Tobin Q ratio as proxy for firm value, the researchers find that firms that use foreign exchange derivatives for hedging have 4.87% premium over firms that do not. This is economically and statistically significant. Pramborg, (2004), studies a sample of Swedish firms exposed to foreign exchange exposure and concludes that hedging transaction risk enhances firm value while hedging translation risk does not. This is an interesting observation and has implications on risk management decisions. A study in UK by Clark & Judge, (2009), conducted on sample 412 non-financial large companies, concludes that hedging foreign exchange exposure is value adding. Accordingly, the impact of hedging with derivatives on firm value can be regarded as industry specific. Carter, Roger & Simkins, (2006), in a study of 28 Airline companies finds that hedging of jet fuel prices leads to higher firm value by a hedging premium of five to ten percent. While several studies have been conducted on gold and silver mining companies, one study by Adam & Fernando, (2006), concludes that hedging with derivatives leads to increased cashflows.

Guay & Kothari, (2003) demonstrate that the relationship between firm value and hedging is spurious and makes no economic sense. The gains postulated in hedging are too minute for large companies. In summary, empirical evidence however is inconclusive on the ability of management to engage in derivatives usage to enhance firm's value. Similar studies by Jin & Jorion (2007) using Tobin Q as proxy for firm's value for 44 North American Gold Mining firms from 1991 to 2000, could not find any positive relationship between hedging activities and firm value. Jin & Jorion (2007) conclude that since commodity price exposure is transparent and available to all investors, it is not rational to expect that hedging against commodity prices should lead to higher firm value.

III. Methodology and Data Collection

3.1 Data Collection

Data for this study was collected through analysis of annual reports of companies listed at the Nairobi Securities Exchange for the years 2008-2012. These annual reports are publically available from several sources. There are 65 companies listed at the Nairobi Securities Exchange. Financial Institutions and Investment companies totaling 20 were excluded from the sample. Banks and Insurance take are on the supply side of the derivative contracts and are the market makers. Investment companies are engaged in ownership of equity and debt positions in other listed companies and will have high correlations with the companies they own. The sample selected for further study was reduced to 31 firms because information for several companies was missing from the public records. The sample obtained is 48% of the firms listed at the Nairobi Securities Exchange, which is considered sufficient for the purpose of the study. Public companies are required by IFRS to disclose their risk exposures and risk management tools. This makes the identification of companies that hedge with derivatives easier because both the fact of hedging and instruments used for hedging are disclosed in the notes to the financial statements.

The essence of using companies listed at the stock exchange is that such companies are normally large and have developed risk management functions. Such companies also provide their financial records on several platforms including to investment companies, brokers and investment analyst websites. For this study annual reports were obtained from several sources including company websites, Nairobi Securities Exchange and Investment Analysts Websites. Observation from such publicly quoted firms can be generalized for whole range of industries and firms.

3.2 Data Analysis Methods

The data was analyzed using both univariate and multivariate analysis. Univariate analysis is used where the data being analyzed is parametric, unrelated and small. Basic univariate analysis was carried out generating basic descriptive data. A correlation test was carried out using Pearson's correlation coefficient.
Multivariate Analysis The independent variable is in binary form with two dichotomous categories: Either a firm is a derivative user (1) or not a derivative use (0). Logistic regression is used here because normal OLS regression will not apply; the data is limited, discrete and non-continuous which flouts the basic assumptions of OLS.

3.3 Variables Description

The dependent variable is a binary, dichotomous measure which was coded "1" for firms that engage in hedging with derivatives and "0" for firms that do not engage in derivative use. This is a fairly common method used in empirical literature (Ahmed and Haris 2012, Sprcic 2007, Nance, Bartram et. al 2004, Géczy, Minton and Schrand 1997, Allayannis and Weston 2007, Smith and Smithson 1993).
The hypothesis developed so far, Market to Book Value represents the value of the firm from the perspectives of the capital markets, Tobin Q represents Firm Value and Book Value of Sales represents the firm's Turnover.

IV. Research Findings and Discussions

4.1 Univariate Analysis

There are 150 observations and it was established that 115 observations were non-derivative users while 40 are derivative users. Descriptive results shown on Table 4:1 shows that Derivative users have larger means and Standard Deviations than Non-Derivative Users on all the three variables tested. This suggests that derivative users are larger companies with higher assets value and turnover.
Table 4.2 shows the correlations between the three proxies in the model. MBV and Tobin Q show significant correlations while BVS is not correlated with either of the two other predictors. Dealing with multicolinearity includes noting and not excluding the related variables in the main regression model. It is expected that the two correlated predictors will move in the same direction and exhibit similar group membership in the regression model.

Table 4.1 Group Statistics

	User_Type	N	Mean	Std. Deviation	Std. Error Mean
MBV	DU	40	1660.4742059	1682.58712324	266.04038355
	NDU	115	1307.2070604	2224.97227139	207.47973413
BVS	DU	40	7.4717080	.61667747	.09750527
	NDU	115	6.4924223	.56108228	.05232119
Tobin_Q	DU	40	1941.7452979	1978.53325471	312.83357556
	NDU	115	1706.1004400	2392.82882487	223.13243845

Table 4.2 Pearson Correlations

		MBV	BVS	Tobin_Q
Firm_Value1_MBV	Pearson Correlation	1	.068	.857**
	Sig. (2-tailed)		.402	.000
	N	155	155	155
Firm_Value2_BVS	Pearson Correlation	.068	1	-.029
	Sig. (2-tailed)	.402		.716
	N	155	155	155
Firm_Value3_Tobin_Q	Pearson Correlation	.857**	-.029	1
	Sig. (2-tailed)	.000	.716	
	N	155	155	155

**. Correlation is significant at the 0.01 level (2-tailed).

4.2 Multivariate Analysis

4.2.1 Baseline Model

Binary Logistics Regression Model was run to determine the influence of firm value on the use of derivatives. The proxies for the variable for the firm value in the model are Market to Book Value Ratio, Book Value of Sales and Tobin Q ratio. A null model was first run as standard comparison measure that will indicate if addition of predictors actually improves the outcome p the model. Table 4.3 shows the classification of the independent variables, which indicates that the null model is effective in classifying the outcomes 74.2% of the

time. The only variable in the equation is the constant and it shows it is significant with a p value of 0.00 and odds ratio of 0.348 as shown in Table 4.4. Table 4.5 indicates the variables in the null model and the model predicts that MBV and Tobin Q ratio will not be significant and BVS will be significant.

Table 4.3 Classification Table[a,b]

			Predicted		
			User_Type		
	Observed		NDU	DU	Percentage Correct
Step 0	User_Type	NDU	115	0	100.0
		DU	40	0	.0
	Overall Percentage				74.2
a. Constant is included in the model.					
b. The cut value is .500					

Table 4.4 Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.056	.184	33.098	1	.000	.348

Table 4.5: Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Firm_Value1_MBV	.846	1	.358
		Firm_Value2_BVS	55.713	1	.000
		Firm_Value3_Tobin_Q	.317	1	.574
	Overall Statistics		56.584	3	.000

4.2.2 Full Model

The Omnibus test of model coefficients shown in Table 4.6 is significant with a p value of 0.00. This indicates that the model is fit for the data provided. The model's overall assessment is important to continue with the analysis. The test indicates the model with predictors is an improvement over the null model. -2 Log likelihood test on the model summary table 4 indicates how poorly the model predicts decisions. The omnibus test indicates the -2 Log likelihood of the model has reduced by 69.794. This is a significant reduction that gives assurance as the model's strength in predicting decisions.

Table 4.6: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	69.794	3	.000
	Block	69.794	3	.000
	Model	69.794	3	.000

Cox Snell R^2 indicates that the model explains 36.3% of the variations the outcome while Nagelkerke R^2, which is the preferred pseudo R2, explains 53.3% of the variations in the outcome of the model. This test is indicative and may not be definitive.

Table 4.7 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	107.223[a]	.363	.533
a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.			

Hosmer and Lemeshow Test on table 4.8 is dependent upon the sample size and flags that fact that the sample size is rather small. The higher the value the better fit of the model. P value of 0.00 may indicate the model is not proper fit.

Table 4.8 Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	30.741	8	.000

The model with predictors is a significant improvement over the null model. Table 4.9 shows the model with variables classifies the variables in the model 89% of the time compared to 74.2

Table 4.9 Classification Table[a]					
			Predicted		
			User_Type		
	Observed		NDU	DU	Percentage Correct
Step 1	User_Type	NDU	110	5	95.7
		DU	12	28	70.0
	Overall Percentage				89.0
a. The cut value is .500					

Table 4.9 shows the results of the logistic regressions of firm value as a determinant of derivative use among the firms listed at the Nairobi Securities Exchange. The B coefficients of BVS is significant and positive with *p* values lower than the cut of 0.05 and with low standard error indicating no numerical or multicolnearity problems. This indicates a significant influence of Book Value of Sales (BVS) on the use of derivatives. BVS has the most pronounced influence in the model with a higher contribution to the variations in the dependent variable. The odds ratio (Exp (B)) of BVS indicates that firms with higher book value of sales are 22.5 times more likely to use derivatives than firms with lower sales. This means derivative users are more likely to have higher sales than non-derivative users. The effects of MBV and Tobin Q are insignificant with p values larger than 0.05. The two variables cannot therefore explain the variations in the dependent variable.

Table 4.10 Logistic Regression Results for influence of firm value in the use of derivatives									
								95% C.I.for EXP(B)	
Proxies		B	S.E.	Wald	Df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Firm_Value1_MBV	.000	.000	1.777	1	.182	1.000	.999	1.000
	Firm_Value2_BVS	3.114	.517	36.217	1	.000	22.512	8.165	62.070
	Firm_Value3_Tobin_Q	.000	.000	1.950	1	.163	1.000	1.000	1.001
	Constant	-22.929	3.693	38.541	1	.000	.000		
a. Variable(s) entered on step 1: Firm_Value1_MBV, Firm_Value2_BVS, Firm_Value3_Tobin_Q.									

4.2.3 Discussion of findings on the influence of Firm Value on the use of derivatives

The hypothesis related to the objective of the study is ***H_o:*** *Firms value has no effect on firm's use of derivatives.* Findings of the regression model indicate that MBV and Tobin Q which are proxies for firm value are insignificant. The proxy for firm turnover in the model, BVS is significant and positive. The findings indicate that firm value does not influence firms' decision to employ derivatives in risk management. The null hypothesis is accepted based on the findings of the regression model.

The findings of the does not study support the theory that managers engage in risk management in order to maximize firm value. The findings are consistent with similar empirical studies reviewed in chapter two. The results agree with Tufano (1996), who pointed out firm value firm value maximization affects the decision to use derivatives for risk management. The results are also similar to Jin and Jorion, (2006) who concluded that firms may not engage in derivative use in order to maximize firm value. The study contradicts the empirical study by Allayannis & Weston (2001) and Pramborg (2004) and agree with the Sprcic (2007) who found that derivative use does not enhance firm value.

V. Summary, Conclusions and Recommendations

The objective of this study is to determine the influence of firm value maximization on the decision to use derivatives. The target population is the firms listed at the Nairobi Securities Exchange. This study contributes to the existing literature about derivative use in developing countries especially in African markets. There are 65 firms listed at the Nairobi Securities Exchange and 31 firms were included in the study. The main proxies included in the study were Market to Book Value Ratio, Tobin Q and Book value of Sales. Univariate analysis indicated that derivative users have larger means and standard deviation indicating that generally larger firms use derivatives. Logistic Regression was employed because the Independent Variable is categorical; either a firm is a derivative user or not.

Regression Results showed that Market to Book Value Ratio and Tobin Q have $p>0.05$ which is not significant. Book Value of Sales has a $p<0.05$ which is significant and odds ratio of 22.5. This indicates that firm value does affect the decision to use derivatives. Evidence here therefore is inconsistent for firm value maximization in the derivative. However, firms with higher sales are more likely to employ derivatives than firms with lower sales which might to evidence of firm size being a determinant of derivative use.

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