Effects of Use of Derivatives on Financial Performance of Companies Listed in the Nairobi Security Exchange

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Abstract   *This study investigated the effects of use of derivatives on financial performance of companies listed in the Nairobi Securities Exchange (NSE). The objectives were; to determine how risk management, efficiency, price stabilization and price discovery in derivatives affect the financial performance of companies in NSE. This study targeted 11 companies that are listed in the NSE trading in the derivative market. Questionnaire was used to collect data from finance officers of the 11 companies listed and NSE officers. The data collected was analyzed by use of descriptive and inferential statistics. Qualitative responses were analyzed using content analysis. A correlation analysis was carried out to determine the performance of the companies listed in the NSE during the pre- and post- adoption of the financial derivatives by these companies. The findings indicated that apart from price stabilization other variables contributed positively to the financial performance of companies listed in NSE.*

Key words   Derivative, Forward Contract, Future Contract, Swap Contract, Options Contract

1. Introduction

1.1 Background Information

According to Chance (1995) the history of derivatives is quite longer than most people think and can be traced to the year 1700 B.C., when Jacob purchased an option costing him seven years of labor that granted him the right to marry Laban's daughter, Rachel. However, Laban reneged, perhaps making this not only the first derivative but the first default on a derivative. Laban required Jacob to marry his older daughter Leah. Jacob married Leah, but because he preferred Rachel, he purchased another option, requiring seven more years of labor, and finally married Rachel.

1.1.1 Global Perspective

The Greeks bought maize forward from the Egyptians some 3000 years ago. The first recorded instance of futures trading occurred with rice in 17th Century. The Chicago Board of Trade was established in 1848 and in the 1870s and 1880s the New York Coffee, Cotton and Produce Exchanges were born. In 1878, a central dealing facility was opened in Chicago, USA where farmers and dealers could deal in 'spot' grain.

Hull (2006) indicates that a major innovation in securities trading took place with the opening of the Chicago Board Options Exchange (CBOE) in April 1973. The CBOE began with call options on 16 heavily traded common stocks and has subsequently evolved into one of the largest exchanges in the world in terms of the value of securities traded. This was the first organized trading of options on an exchange.

The American Stock Exchange and the Philadelphia Stock Exchange started trading options in 1975, and the Pacific Stock Exchange introduced option trading in 1976. In 1977, put options became exchange listed and expanded the benefits of options. The formation of the South African Futures Exchange (SAFEX) in

September 1988 where standardized option contracts on equity and interest rate futures contracts are traded.

Pandey (2005) indicates that a derivative is a financial instrument whose pay-off is derived from some other asset which is called an underlying asset. It refers to those items that do not have their own independent values; rather it has a derived value. Therefore, a derivative has a significant place in finance and risk management. Balvinder (1995) said the increasing globalization of commerce and industry is exposing firms to various financial risks, unrelated to their lines of business.

According to Pandey (2005), financial derivative instruments have mushroomed very quickly from simple financial futures to a wide variety of exotic and complicated securities around the world. Derivatives markets can facilitate the management of financial risk exposure, since they allow investors to unbundle and transfer financial risk. In principle, such markets could contribute to a more efficient allocation of capital and cross-border capital flow, create more opportunities for diversification of portfolios, facilitate risk transfer, price discovery, and more public information (Tsetsekos and Varangis, 1997; Ilyina, 2004).

Bartram *et al*. (2006) on the use of derivatives by nonfinancial firms examined some 7,300 nonfinancial firms from 48 countries, using corporate reports from 2000 and 2001. They found that 60 percent of these firms used derivatives. They indicated that the most frequently used derivatives were foreign-exchange (44 percent of firms), interest-rate derivatives (33 percent of firms) and commodity derivatives (10 percent). Further, they indicated that swaps and forwards are used more than options. Wayne (2009) found that when firms started using derivatives, on average their stock return volatility fell by 5 percent, their interest-rate exposure fell by 22 percent, and their foreign-exchange exposure fell by 11 percent. Clearly, firms do use derivatives for hedging, although if firms hedged systematically, the evidence suggests they would use derivatives much more than they actually do. Bodnar *et al.* (1995) found out that 28 percent of the firms they surveyed used derivatives to minimize earnings volatility.

1.1.2 Kenyan Perspective

As a country, Kenya, still lags behind in development of a well-functioning regulated financial derivatives market despite of it being a leading emerging market in Africa. A study by Kamenchu (2013) on the factors leading to the slow adoption of derivatives use in Kenya found out that legal framework and trade liberation are the main factors hindering use of derivatives. However, the study was limited to Kenyan commercial banks. In another study by (Njoroge *et al.,* 2013) indicated that the commonly used derivatives instruments by Kenyan companies are the forward contracts and swaps. Indeed, companies use forward contracts to hedge against their imports and exports while swaps are used when making arrangements to exchange cash flows over time. Nzuki (2010) found out that oil companies in Kenya seem to give due consideration to crude oil price volatility and as a consequence, they use a hybrid of derivatives, mainly futures market and forward contracts.

1.2 Statement of the Problem

Over the last few years, companies in the emerging market have increased the use derivative to hedge their positions. Thus the derivative market has experienced a rapid growth over the recent years. Even though information on firm derivative usages is widely available in the developed world, the empirical research regarding whether the use of derivative will increase the financial performance of a company is still subject of debate especially in the developing world.

BIS Quarterly Review (2013) indicated that notional amounts for credit default swaps continued to decline during the second half of 2012, from $26.9 trillion at end-June 2012 to $25.1 trillion at end-December 2012. This brought the cumulative reduction since end-June 2011 to $7.3 trillion, partly due to the ongoing compression of contracts among dealers. In the second half of 2012, the reduction was concentrated among reporting dealers and in maturities over five years. Contracts with foreign counterparties dropped to $19.0 trillion at end-December 2012, whereas those with counterparties headquartered in reporting dealers' home country increased from $5.4 trillion at end-June 2012 to $6.1 trillion at end-December 2012.

CMA (2013) indicates that the factors to measure the performance of a futures exchange and what constitutes success of a futures exchange is; trading volumes; and open interest. During the last decade a number of futures exchanges have sprung up in Latin America, Asia and Africa based on the premise that

there is a need in the country for a platform for; managing price volatility and providing price discovery. The Kenyan economy is increasingly opening up its trading patterns to the outside world leading to a diverse exposure to foreign exchange rate fluctuations, price volatility, speculative dealings and other market inefficiencies. Indeed, Nzuki (2010) established that derivatives usage and hence their effect in Kenya oil companies is below the optimal level; 31 to 60% against an optimal of 93%. This brings the discussion about the slow pace of development of financial derivatives in Kenya and by extension their effect on the performance of companies.

Gitogo *et al.* (2013) on the study about the relationship between derivatives and the financial performance of commercial banks in Kenya found out that there exist a relationship between the derivatives and the financial performance of the commercial banks. However, very few studies have been done in the developing countries especially Kenya on the impact of financial derivatives on the financial performances of companies listed in the NSE. Therefore, this study sought to establish how the pre and post adaptation of derivatives have impacted the financial performance of the companies listed in the NSE. The study covered both financial and non-financial firms which many studies have not covered.

1.3 Objectives of the Study

1.3.1 General Objective

The overall objective of the study wass to establish the effect of derivatives on the financial performance of companies listed in NSE.

1.3.2 Specific Objectives

The specific objectives of this study was to:

1. To determine how the risk management in derivatives affects the financial performance of companies listed in Nairobi Security Exchange.

2. To examine if efficiency in trading of derivatives affects the financial performance of companies in Nairobi Security Exchange.

3. To establish if price stabilization in derivatives affect the financial performance of companies in Nairobi Security Exchange.

4. To explore if price discovery in derivatives affect the financial performance of companies in Nairobi Security Exchange.

2. Literature review

2.1 Theoretical Review

A theory is viewed by Cooper and Schindler (2008) as a set of systematic interrelated concepts, definitions, and propositions that are advanced to explain and predict a phenomena or facts. According to this study, the theoretical review will involve other scholar's theories about risk management, trading efficiency, speculation, price stabilization, and price discovery. This guided the study in terms of the conceptual framework.

2.1.1 Agency Theory Model

The agency theory developed for profit corporations in mind (Ross, 1933; Meckling & Jensen, 1976, Fama, 1980) argues that the interest of the principals and agents are intrinsically misaligned, due to the theory's rationality assumption. Thus the key stakeholders in the derivative market are the shareholders versus the managers giving rise to the principal-agent conflict.

Agency theory indicates that top management may have incentives to use derivatives to reduce personal risk if CEO cash compensation is risky, insiders have high levels of wealth vested in firm equity, the CEO is about to retire, or equity ownership is diffuse. In addition, division managers have incentives to use derivatives to reduce risk in measures of division performance.

2.1.2 Information Signaling Theory

Information signaling model developed by (Merton Miller and Kevin Rock 1985) suggest that derivatives trading convey information to individual and institutional investors regarding the firm's future prospects. Indeed when a company listed on the NSE makes pronouncement about its trading on derivatives, the expectations of the public especially speculators tend to rise.

2.1.3 Black-Scholes Option Valuation Model

One of the most widely used option-valuation techniques among traders and other practitioners is an ad hoc procedure in which Black-Scholes (1973) implied volatilities are smoothed across strike prices and maturities and then plugged back into the Black-Scholes formula. This "ad hoc Black-Scholes" approach has become something of a benchmark for evaluating the forecast accuracy of option pricing models because of its consistently impressive empirical performance. Davis (2001) and Figlewski (2002) argue that this kind of interpolation technique can be particularly useful for valuing options which are illiquid or which do not trade on an exchange.

2.1.4 Simple Binomial Tree Approach Valuation Model

Cox, Ross and Rubinstein (1979) provided a generalizable numerical method for the valuation of options. The binomial model uses a "discrete-time" (lattice based) model of the varying price over time of the underlying financial instrument. In general, binomial options pricing models do not have closed-form solutions. It's able to handle a variety of conditions for which other models cannot easily be applied. This is largely because the BOPM is based on the description of an underlying instrument over a period of time rather than a single point. As a consequence, it is used to value American options that are exercisable at any time in a given interval as well as Bermudan options that are exercisable at specific instances of time

2.2 Conceptual Framework

Borg, Gall & Gall (2005) defines a conceptual framework as a graphical or diagrammatical representation of the relationship between variables in a given study. From the foregoing theoretical review Figure 1 provides this study's conceptual framework. The financial performance of derivatives depends on the interrelationships of the independent variables which include risk management, trading efficiency, speculation, price stabilization, and price discovery, and the dependent variable; performance of companies listed in the NSE. The explanatory and the explained variables are as a result of derivatives trading in Kenya.
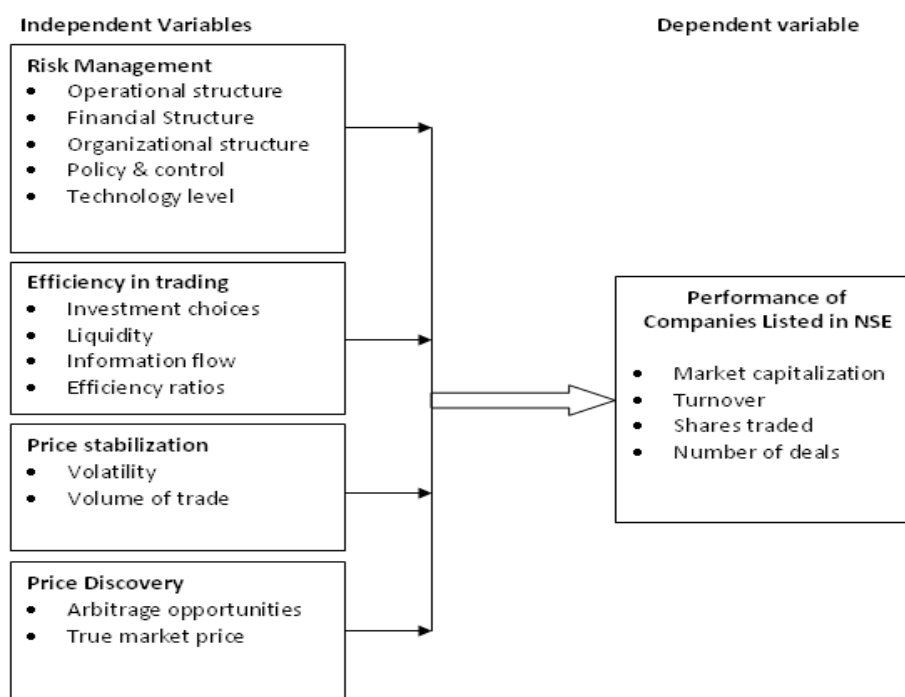

Figure 1. Conceptual framework

2.3 Empirical Review

2.3.1 Derivatives

Bartram *et al.,* (2008) found that derivative use is more prevalent in firms with higher exposures to interest rate risk, exchange rate risk and commodity prices. Despite this, firms that use derivatives have lower estimated values of both total and systematic risk, suggesting that derivatives are used to hedge risk, rather than to speculate. The most commonly used derivatives instruments in Kenya include; forward contracts (to hedge against their imports and exports) and swaps (to make arrangements to exchange cash flows over time).

David Harper (2010) mentioned the uses and the functions performed by derivatives are as Foreign Exchange Risk: The risk that changes in the currency exchange rate will have an adverse effect on the company's revenue. It also known as currency risk.

Interest Rate Risk: Companies can hedge interest-rate risk in various ways. Consider a company wishes to sell a division in one year but the interest rate is expected to fall in the future, then it could purchase (or 'take a long position on') a Treasury futures contract to lock in the interest rate by today. Thus, the company is effectively locking in the future interest rate.

Commodity or Product Input Hedge**:** This is the risk commonly faced by companies that are heavily sensitive to the price change of raw-material inputs or commodities. For example airline industry, it consumes lots of jet fuel. In the past, most airlines have given a great deal of consideration to hedging against crude-oil price increases.

2.3.2 Risk Management

Risk management is the most important function of derivatives and it's not about the elimination of risk rather it is about the management of risk. Financial derivatives provide a powerful tool for limiting risks that individuals and organizations face in the ordinary conduct of their businesses.

Mckenzie *et al.* (2000) evaluated the impact of trading in future contracts on individual stocks on the systematic risk and volatility of the underlying shares in the Australian equity market. Their study observed a general reduction in systematic risk on individual stocks following the listing of futures. Deshmukh, Greenbaum, and Kanatas (1983) observed that an increase in interest rate uncertainty in the banking sector encourages banks to decrease their lending levels to customers. Consequently, they indicated that if interest rate risk can be controlled by derivatives, then the lending institutions that use derivatives could experience less interest rate uncertainty and enable them to enhance their lending activities which would increase returns. Thus, their profitability would be higher unlike those institutions that do not use derivatives to control for interest rate uncertainty.

On the contrary, Brewer, *et al.* (1996) examined the correlation between risk and derivative usage for savings and loan institutions. They found out that depository institutions that used derivatives experienced relatively greater growth in their fixed rate mortgage portfolios. Simmons, K. (1995) examined the pattern of derivative use by commercial banks but her study provided no indication as to whether banks use derivatives to increase or reduce interest rate risk.

Allayannis& Weston, (2001) investigated the use of foreign currency derivatives and firm market value of non-financial firms and revealed a positive relationship between firm value and hedging practices of the firms. Carter *et al.,* (2004) examined whether hedging fuel price risk adds value to the firms in the USA airline industry and found out that using derivatives to manage the volatility in fuel prices adds value to the firms operating under the industry.

Hentschel and Kothari (2001) are corporations reducing or taking risks with derivatives? The study was to investigate whether the use of derivatives allowed firms to reduce their level of riskyness. Their result indicated that there was no significant relationship between the volatility of a firm's stock prices and the size of the firm's derivatives position. The study established that except for the banks and financial firms, the use of derivatives by non-financial firms has grown rapidly in the last two decades.

Gongera et al. (2013) Effects of Financial Risks on Profitability of Sugar Firms. This research examined the effects of financial risks on profitability of sugar firms in Kenya. The study indicated that financial risk involved includes credit risks, interest rate risks and liquidity risks. The study established that, a significant,

negative correlation existed between liquidity risk and firms' profitability, and a strong, positive correlation also existed between firms' efficiency of risk management and profitability.

Keffala *et al*. (2011).The Effect of Derivative Instrument Use on Capital Market Risk: Evidence from Banks in Emerging and Recently Developed Countries. This study investigates the use of derivative instruments by banks in both emerging and recently developed countries in terms of capital market risk. The author indicates that the use of options increases total return risk and unsystematic risk, while the use of forwards and futures decreases total return risk. On the other hand, swaps negatively affect systematic risk. The study concludes that banks in the study sample do not appear to be at risk by using derivative instruments. However, both studies focused only on banks in developed countries.

Cummins, et al (1998) Derivatives and Corporate Risk Management: Participation and Volume Decisions in the Insurance Industry. This study examined the factors that influence the use of financial derivatives in the U.S. insurance industry. The authors found evidence that insurers are motivated to use financial derivatives to reduce the expected costs of financial distress in firms. Indeed, the decision to use derivatives by companies is inversely related to the capital-asset ratio for both property insurers and life insurers. They also found evidence that insurers use derivatives to hedge against exchange rate risks, asset volatility and liquidity.

2.3.3 Efficiency in Trading

The derivatives market enhances greater market depth by enticing investors to trade in the underlying markets. Danthine (1978) observed that this increased volume in trading leads to greater depth in the cash markets. The market depth role of the derivatives is largely associated with the liquidity influence since there are positive effects which result from an increase in the derivatives trading activity. An enhanced derivative market depth is advantageous since the better the depth of the market the larger the transaction required to affect the price of the security (Danthine, 1978). Consequently, the stability of the cash markets is maintained and the entire capital market becomes profitable.

Howells & Bain (2002) observed that the derivatives market usually contributes to the integration of global capital markets which in turn improves the global allocation of savings and fostering higher investment levels in the economy. Kavussanos *et al*., (2008) noted that by providing a cheap and efficient system to hedge and speculate, the derivatives market facilitates increased transparency, development and overall functioning in the capital markets. Kavussanos, *et al.,* (2008) indicated that the introduction of a derivatives exchange in a capital market is beneficial as derivatives can complete the market and improve efficiency.

The NZFOX (2008) indicated that because derivatives lower the risk of holding the underlying asset, individual and institutional investors are encouraged to join the secondary market and trade securities which eventually enhance liquidity in the primary market because people are less hesitant to purchase new securities. Figlewiski (1987) supports this view, stating that investors are more enthusiastic about purchasing the underlying securities because they can manage their risk easily with futures and options. ASX (2006) revealed that the hedging practices by investors tend to generate further hedging activity in the underlying securities by other market makers which creates a flow-on liquidity effect. Malkiel (1987) noted that liquidity in the underlying market is increased through arbitrage. Further, investors may increase trading of underlying securities by provision of a connection with the underlying markets in order to gain arbitrage profits.

The ASX (2006) points out that liquidity in the underlying markets increases because derivatives create an additional trading tool enabling investors to carry out trading strategies. Skinner (1989) state that the advantages of increased liquidity in the underlying markets due to hedging, arbitrage and new trading strategies be offset by lower order flow. The efficiency and low cost characteristics of the derivatives market make it substantially an appealing option for investment. Consequently, this leads to lower levels of liquidity within the cash markets. Increasing liquidity in the underlying markets is a valuable component of the derivatives market since investors can easily dispose their securities when they wish without losing much capital or substantially affecting the price of the securities.

2.3.4 Price Stabilization

Pilar and Rafel (2002) examined the effect of introduction of futures and options in the Spanish market and observed a decrease in the uncertainty in the underlying market and an increase in the liquidity in the

post derivatives period. Drimbetas *et al.* (2007) found that the introduction of derivatives into the market induces a reduction of the conditional volatility of the market and consequently it increases its efficiency.

Pok & Poshakwale (2004) showed that the introduction of futures trading increases spot market volatility and the flow of information to the spot market. They also found that the underlying stocks respond more quickly to the recent news than the non-underlying stocks. Cox (1976) found that the uninformed speculators participating in the derivatives markets increase the volatility of the spot market prices.

Lockwood & Linn, (1990), the proponents of 'Destabilizing forces' hypothesis, observed that the introduction of futures trading increases the spot market volatility and thereby, destabilizes the market. They pointed out that derivatives market provides an additional channel by which information can be transmitted to the cash markets.

On the other hand, Debasish *et al.,* (2007), 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. Edwards (1988) examined that the introduction of S&P500 futures contracts and found out that there was reduction in volatility in the post-introduction period. Freris (1990) also found that the stock market volatility was decreased after the introduction of futures. Brown-Hruska & Kuserk (1995) found that futures markets decrease the stock market volatility after the introduction of the futures. Bologna and Cavallo (2002) studied the Italian market's volatility and found that the stock market volatility was lower after the establishment of the futures contracts trading markets.

Hellwig (1980) observed that futures markets tend to destabilize the cash markets because of their higher degree of leverage. Indeed, investors without perfect information enter the futures market which eventually increases volatility in the market. Finglewski (1981) concluded that the volatility of the underlying asset is increased after the introduction of futures markets. Stein (1987) also concluded that the derivatives are responsible for the destabilization of the underlying spot market. Aggarwal (1988) and Harris (1989) supported that the volatility of the period after the introduction of futures was higher. Maberlyet *et al.* (1989) found that the volatility of the S&P500 index was higher for the period after the introduction of futures. Lockwood and Lim (1990) found that the volatility in the spot market increased because of the introduction of futures trading. Brorsen (1991) reached the same result and he found that volatility was higher after the futures entered the stock markets.

Lee and Ohk (1992) examined the effect of the introduction of the futures trading on the volatility of the market in Japan, Hong Kong, the UK, the USA and Australia. Except for the markets of Australia and Hong Kong, they concluded that the volatility of the stock market increased after the introduction of futures trading. Kamara *et al.* (1992) supported the proposition that the beginning of futures market trading destabilizes the spot market by increasing the volatility by examining the S&P500 index in the US market. Pok & Poshakwale (2004) and Ryoo & Smith (2004), after examination of the Malaysian and the Korean markets respectively, found that the increased volatility of the underlying spot market was due to the introduction of futures market.

2.3.5 Price Discovery

The major objective of a commodity market exchange is to create an efficient system for matching supply and demand in order to establish the true market price based on the equilibrium of the forces of supply and demand. Malkiel (1989) and Gereben (2002) noted that the operation of the derivatives market impacts the underlying markets by playing a 'price discovery' role. Hawkesby, (1999) indicated that individual and institutional investors are more likely to predict future prices of underlying assets by examining the operational activities within the derivatives market. This is because of the forward looking nature of derivatives and the fact that information is absorbed rapidly in the derivatives markets. This price discovery role benefits the capital markets as it enables traders to make better "assessments of risk management, portfolio management and budget planning decisions" (Kavussanos *et al.,* 2008). Ultimately better investment choices are made overall.

An efficient price discovery process is characterized by the fast adjustment of market prices from the old equilibrium to the new equilibrium with the arrival of new information (Yan and Zivot, 2007)). Garbade and Silver (1983) (GS henceforth) offer a formal model to analyze the process of price discovery and show that this process is leaded by the markets where the number of participants is higher (more liquid). Most of the

current price discovery analyses are based on either Hasbrouck (1995) or Gonzalo and Granger (1995) (GG henceforth) econometric methodologies. In one of these applications to the commodity markets, (Figuerola-Ferretti and Gonzalo 2008) develop an econometric approach in order to match the theoretical model of GS and the econometric methodology of GG.

Maniar (2000) Impact of Derivatives trading on the underlying Securities; A Case study on National Stock Exchange of India (NSE) of India. The paper analyzes the effect of the introduction of derivatives (futures and options) in the Indian market on the volatility and the trading volume of the underlying index. The author found evidence that the conditional volatility of the underlying index declines after derivative markets are introduced. He also observes a decrease in uncertainty in the underlying market and an increase in liquidity, which possibly enhance their efficiency. The objective of the study was to recognize the impact of introduction on the conditional volatility and trading volume of NSE index. The study concluded that the adoption of derivatives could help to stabilize their spot markets, expanding the investment opportunity set and improving the daily market operation.

Debasish (1998) An Empirical Study on Impact of Index Futures Trading On Spot Market in India. The study investigates the effect of futures trading on the volatility and operating efficiency of the underlying Indian stock market by taking a sample of selected individual stocks. The author compares spot price volatility changes before and after futures trading is introduced in the stock indices. The result shows that the introduction of Nifty index futures trading in India is associated with both reduction in spot price volatility and reduced trading efficiency in the underlying stock market. The objective of the study was to establish whether the index futures trading in India has caused a significant change in spot market volatility of the selected underlying individual stocks.

Skinner (1991), Options markets and stock return volatility. The study investigated how the options market affects the volatility of the stock returns to an investor. Indeed, this paper documents greater information flows following the listing of derivatives. The author indicated that the market volatilities that investors consider when pricing derivatives have an effect on the markets' expectation of the underlying asset's volatility.

Damodaran & Lim (1991) Effects of option listing on stocks return processes. The paper investigated the effects of option trading on the stock return of companies listed in the stock exchange. The author found that "empirical examinations of information structure proxies reveal an increase in the amount of information" in the underlying markets after derivatives have been introduced.

2.4 Research Gaps

There are no clear records available showing how the introduction of derivatives affects the risk management, speculations, market efficiency, price discovery before and after on the performance of companies. Although there are records to show the impact of derivatives on the firms' performance especially on firms' value, the studies fail to show whether the impacts are immediate or delayed. This study would seek to establish that. Although there are records showing the impact of derivatives on the performance of companies, most studies show the impact on either financial or non-financial companies. This study covers both financial and non-financial firms, which many studies have not covered. All the literature reviewed indicates that previous researchers only concentrated on a few a variables separately. This study will cover additional important variables that were omitted by previous studies, which have not been studied in other studies including in the Kenyan scenario.

3. Methodology of research

3.1. Research Design

The study adopted a descriptive research design. According to Saunders, Lewis and Thornhill (2009), descriptive research answers research questions who, what, where, when and how is the problem. In this study, descriptive research design was used to achieve this by describing the data and characteristics about the population of phenomenon being studied; 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 and what influences such decisions.

3.2. Population

Kothari (2004) defines a population as the researcher's 'universe'. The population of the study comprised of all the Fund and Finance Managers, Accountants, Market Dealers and Market Supervisors at the 11 companies involved in the trading of the derivatives, before and after the adaptation of the derivatives. This target population was made of 47 senior and middle level managers, supervisors and accountants of the companies listed in the NSE dealing in derivatives.

The study targeted a population of companies dealing in derivatives listed in the NSE in Nairobi. The study targeted this population because they have a greater influence on the financial derivative market. The target population was stratified into senior and middle level management. The target population was for both financial and non-financial firms listed at the NSE.

3.3. Sample and Sampling Techniques

The sampling frame was the list of all Fund and Finance Managers, Market Supervision Officers, Market Dealers and Accountants in the companies dealing with derivatives. The sampling frame was distributed in the study as follows; Finance Managers, Fund Managers, Accountants, Market Supervisors, and Market Dealers. A stratified random sampling was used to select the sample. The target population was listed based on firms listed in the NSE. A random starting point of identifying firms dealing with derivatives was identified and the required sample will be obtained from 11 firms.

3.4 .Instruments

3.4.1. Questionnaires

A structured questionnaire was utilized as the primary method to collect primary data from 12 respondents from the companies listed in the NSE. The questionnaire was hand delivered to the respondents' offices with a request to fill them in one week's time. The questionnaires were open-ended which encouraged the respondents to provide as much information as possible. The study collected primary and secondary data using semi-structured questionnaires and annual reports respectively. The secondary data was collected for a 5 year period (2008 to 2012). The study conducted reliability and validity test on the questionnaires. The study sought an introductory letter from Jomo Kenyatta University of Agriculture and Technology. This was used to get a permit from National Council for Science and Technology (NCST). This was then presented to the listed firms of Nairobi Securities Exchange authorize the study. The dates were scheduled by the researcher to administer questionnaires to Top Level Management and Middle Level Management.

3.5. Data Processing and Analysis

The study anticipates generating both quantitative and qualitative data. According to Cooper and Schindler (2003), analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making. Returned questionnaires were sorted to ensure their completeness and accuracy. Thereafter, responses were coded for analysis using Statistical Package for Social Sciences (SPSS). Qualitative data was operationalized by arranging the data according to emerging themes or patterns with assigned numbers to make them measurable. Content analysis formed the basis of analysis. For quantitative data, correlation coefficients were calculated for initial exploration of the relationships between variables. Correlation was used to measure the size and direction of the relationship between two variables (Tabachnick and Fidell, 2001). A correlation analysis was carried out to measure the inter-relationship between independent variables and dependent variables. In addition, a regression analysis was conducted in order to further evaluate and understand the relationships between the dependent and independent variables of the study. The two basic types of regression are linear regression and multiple regressions. Linear regression uses one independent variable to explain and/or predict the outcome of Y, while multiple regressions use two or more independent variables to predict the outcome. The general form of each type of regression is:

Linear Regression: $Y = \beta_0 + \beta X + \varepsilon$ (1)

Multiple Regression: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ (2)

Where:
Y= the variable that we are trying to predict (Financial performance);
X_1, X_2, X_3 and X_4= the variable that used to predict Y;
β_0= Constant Term;
β_1, β_2, β_3, β_4 = Beta coefficients;
ε = Error Term.

In multiple regressions the separate variables are differentiated by using subscripted numbers.

Regression takes a group of random variables, thought to be predicting Y, and tries to find a mathematical relationship between them. This relationship is typically in the form of a straight line (linear regression) that best approximates all the individual data points. Regression is often used to determine how many specific factors such as the price of a commodity, interest rates, particular industries or sectors influence the price movement of an asset.

4. Research findings and Discussion

4.1. Response Rate

Response rate according to America Association for Public Opinion Research (AAPOR), (2011) is the rate of complete questionnaire with reporting units divided by the number of eligible reporting units in the sample.The study issued 40 questionnaires from which 38 were duly filled and returned. This brought the response rate to 95.0% for the targeted respondents. According to Mugenda and Mugenda (2008), a response rate of 50% is acceptable for analysis publishing. According to Babbie (1990), a response rate of 60% is good, 70% very good and 50% adequate for analysis and reporting from manual surveys. Therefore, the response rate was considered excellent for analysis.

4.2 Effect of Risk Management in Derivatives on Financial Performance of Companies Listed in Nairobi Security Exchange

4.2.1 Descriptive statistics of risk management

The study sought to find the descriptive statistics of statements on risk management. The findings of the study show that, 57.9% of the respondents agreed that the operational structure in risk management of the firm supports the effective performance of the company. A simple majority (47.4%) agreed that the financial structure of the firm effectively improves performance of the company, 57.9% strongly agreed that the organizational structure in risk management of the firm support the effective performance of the company, 47.4 % agreed that the Organizational resources of the firm support the effective performance of the company. A majority (52.6%) of the respondents either agreed or strongly agreed that the available technology in risk management of the firm support the effective performance of the company, 31.6% agreed that reporting and disclosures requirements in risk management of the firm support the effective performance of the company, and 36.8% were undecided on responsibilities in risk management of the firm support the effective performance of the company.

4.3 Effect of Efficiency in Trading of Derivatives on Financial Performance of Companies in Nairobi Security Exchange

4.3.1 Descriptive statistics of Efficiency in Trading

The study sought to find out if efficiency in trading of derivatives affects the performance of companies listed in the NSE. The results show that 47.4% of the respondents agreed that individual investment choices affect trading of derivatives of the firm. A simple majority (42.1%) of the respondents were undecided on institutional investment choices affect trading of derivatives of the firm. Another 42.1% were undecided on the liquidity of their firm support the trading of the derivatives, 55.3% of the respondents agreed that informational flow in trading of derivatives effectively support financial performance of companies, and 47.4% agreed that the efficiency ratios in trading influence the usage of derivatives.

4.4 Effect of Price Stabilization in Derivatives on Financial Performance of Companies in Nairobi Security Exchange

4.4.1 Descriptive on whether the price stabilization of derivatives affects the performance of companies listed in the NSE

The study sought to establish the descriptive statistics of the effect that price stabilization of derivatives has on the performance of companies. From the findings, 50.0% of the respondents agreed that volatility of prices in the market influence the usage of derivatives, and 52.6% of the respondents agreed that the volume of activities of their company influence the usage of derivatives.

4.5 Effect of Price Discovery in Derivatives on Financial Performance of Companies in Nairobi Security Exchange

4.5.1 Descriptive statistics of the price discovery of derivatives and its effects on the performance of companies listed in the NSE

The research sought to establish the descriptive statistics of the price discovery of derivatives and its effects on the performance of companies listed in the NSE. The findings were summarized in Table 4.6. The table shows that 52.6% of the respondents strongly agreed that arbitrage opportunities exist in the market to warrant the trading in derivatives, and 50.0% strongly agreed that the activities in the market provide a true market price of derivative products.

4.6 Performance of the firm

The research sought to establish whether the performance companies dealing with derivatives effect on the performance of companies listed in the NSE. The findings were summarized in Table 1. The table shows that 34.2% of the respondents strongly agreed that market capitalization of your firm has been influenced by risk management policies, and 47.4% strongly agreed that Turnover realized by the your firm is a reflection of efficiency in trading. Majority 52.6% strongly agreed that the volume of shares traded by your firm is a result of price stabilization while 60.5% strongly agreed that the number of deals entered into by your firm is due to efficient price.

Table 1. Model Summary Table of Performance of Companies Listed in NSE and independent variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.772[a]	.596	.581	3.541

a. Predictors: (Constant), Risk Management, Efficiency in trading, Price Stabilization, Price Discovery

ANOVA Table of Performance of Companies Listed in NSE and independent variables

ANOVA Table 4.8 that was generated from the data was used to show the statistical significance of the model and also for correlation analysis. Tables 4.9 show that the model is statistically significant since $p < .05 \ (Sig. = .000 \ or \ .001)$.

4.7 Regression Analysis

The model summary Table 2 showed the percentage of the dependent variable (Performance of Companies Listed in NSE) that could be explained by the independent variables. From Table 4.28, 59.6% (R Square) of Performance of Companies Listed in NSE could be explained by independent variables, when other factors were kept constant.

Coefficients Table 3 shows that apart from price stabilization, all other independent variables contribute positively to the dependent variable (Companies Listed in NSE), in the first model. Moreover, the contributions are all statistically significant as the p-values are less than .05 (Sig. = .000), except for price stabilization which is statistically insignificant (Sig. > .05).

Table 2. Anova Table of Performance of Companies Listed in NSE and independent variables (Risk Management, Efficiency in trading, Price Stabilization, Price Discovery)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	481.495	1	481.495	38.409	.000[b]
1	Residual	325.934	26	12.536		
	Total	**807.429**	**27**			

a. Dependent Variable: Performance of Companies Listed in NSE
b. Predictors: (Constant), Risk Management, Efficiency in trading, Price Stabilization, Price Discovery

Table 3. Coefficients table of Performance of Companies Listed in NSE against the independent variables (Risk Management, Efficiency in trading, Price Stabilization, Price Discovery) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	6.960	1.566		4.646	.000
	Risk Management	2.051	.874	.237	2.348	.021
1	Efficiency in trading	2.115	.753	.268	2.808	.006
	Price Stabilization	-.436	1.575	-.027	-.277	.783
	Price Discovery	3.426	1.185	.279	2.890	.005

a. Dependent Variable: Performance of Companies Listed in NSE

$$Y = 6.960 + 2.051X_1 + 2.115X_2 - 0.436X_3 + 3.426X_4 + \mathrm{e}$$

4.10. Pearson's Correlation Analysis

The study sought to find out if the dependent variable was correlated with the independent variables and the direction of the correlation. I addition the study sought to establish if the independent variables were correlated with each other. The findings were summarized in Table 4. From the table, all the independent variables had an above average positive correlation with the dependent variable. All the correlation coefficients were highly significant (p-value was less than .05). Further, the independent variables were positively correlated with each other and all the correlations were highly significant (p-value was less than .05).

Table 4. Pearson's Correlation Analysis

Financial Performance		Risk Management	Efficiency trading	inPrice stabilization	Price discovery	
Financial performance	Pearson Correlation	1				
	Sig. (2-tailed)					
Risk Management	Pearson Correlation	.540**	1			
	Sig. (2-tailed)	.000				
Efficiency in trading	Pearson Correlation	.524**	.644**	1		
	Sig. (2-tailed)	.000	.000			
Price Stabilization	Pearson Correlation	.458**	.735**	.738**	1	
	Sig. (2-tailed)	.070	.063	.061		
Price Discovery	Pearson Correlation	.559**	.797**	.583**	.690**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

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

5. Summary, Conclusions and Recommendations

5.1. Summary

5.1.1. Risk Management and Derivatives

The study sought to find out how the risk management in derivatives affects the financial performance of companies listed in NSE. The findings showed that, 57.9% of the respondents agreed that the operational structure in risk management of the firm supports the effective performance of the company. A simple majority (47.4%) agreed that the financial structure of the firm effectively improves performance of the company, 57.9% strongly agreed that the organizational structure in risk management of the firm supports the effective performance of the company, 47.4% agreed that the Organizational resources of the firm supports the effective performance of the company. A majority (52.6%) of the respondents either agreed or strongly agreed that the available technology in risk management of the firm supports the effective performance of the company, 31.6% agreed that reporting and disclosures requirements in risk management of the firm supports the effective performance of the company, and 36.8% were undecided on responsibilities in risk management of the firm on how it supports the effective performance of the company.

The study also sought to find out how the respondents would rate the performance of the risk management practices in their companies. The findings show that 92.1% of the respondents said it was good while only 7.9% said that risk management practices in their companies were poor.

5.1.2 Efficiency in Trading and Derivatives

The study sought to find out if efficiency in trading of derivatives affects the performance of companies listed in the NSE. The results showed that 47.4% of the respondents agreed that individual investment choices affect trading of derivatives of the firm. A simple majority (42.1%) of the respondents were undecided on institutional investment choices affect trading of derivatives of the firm. Another 42.1% were undecided on the liquidity of their firms supports the trading of the derivatives, 55.3% of the respondents agreed that informational flow in trading of derivatives effectively supports financial performance of companies, and 47.4% agreed that the efficiency ratios in trading influences the usage of derivatives.

Further the study sought to find out how respondents would rate the efficiency in trading of derivatives in their companies. The findings were summarized in Figure 4.6. Which showed that 71.1% of the respondents said the efficiency was good while 28.9% said it was poor?

5.1.3 Price Stabilization and Derivatives

The study sought to establish if price stabilization in derivatives affect the financial performance of companies in Nairobi Security Exchange. From the findings showed, 50.0% of the respondents agreed that volatility of prices in the market influence the usage of derivatives, and 52.6% of the respondents agreed that the volume of activities of their company influences the usage of derivatives. In addition the study sought to find out how the respondents would rate price stabilization in their companies. The findings presented that majority (81.6%) of the respondents rated price stabilization practices as good while 18.4% said the practices were poor.

5.1.4 Price Discovery and Derivatives

The study sought to explore if price discovery in derivatives affect the financial performance of companies in Nairobi Security Exchange. The findings were showed that 52.6% of the respondents strongly agreed that arbitrage opportunities exists in the market to warrant the trading in derivatives, and 50.0% strongly agreed that the activities in the market provide a true market price of derivative products.

The study further asked the respondents to rate the price discovery of derivatives in the companies. The findings were presented in Figure 4.8. Where, 60.5% of the respondents rated it as good while 39.5% rated it as poor.

5.2. Conclusions

Non-financial and financial firms in Kenya do not hedge using derivatives as they feel that exposures are more effectively managed by other means (non-derivative use) and some felt that they were insufficiently

exposed to financial risks. Firms drive for financial risk hedging is directly related to their exposure to financial risks affecting their interest rate, currency, stock and bond returns and commodity prices.

Firms' listed in the NSE use of derivatives is also affected by management skepticism against derivative use as hedging instrument. Derivative market and instruments used are not fully developed in Kenya hindered by political environment, knowledge of derivatives, participants' attitude, financial infrastructure and foreign competition. Thus, firms listed with the NSE find it had to use derivative against the necessary market microstructure. These firms also find difficulty in pricing and valuing derivatives and accounting treatment of derivative even though such use is relatively inexpensive and effective method to reduce risk. To the contrary, nonfinancial firms in Kenya view costs of establishing and maintaining a derivative program as exceeding the expected benefits. The second model checks on the relationship between Performance of Companies Listed in NSE and the independent variables (Risk Management, Efficiency in trading, Price Stabilization, Price Discovery). Findings showed that there is a high significant (p-value less than .05).

The findings also showed that, all the independent variables had an above average positive correlation with the dependent variable. All the correlation coefficients were highly significant (p-value was less than .05). Further, the independent variables were positively correlated with each other and all the correlations were highly significant (p-value was less than .05).

5.3. Recommendations

The study advocates for speedy establishment of derivative market in Kenya together with its ancillary regulatory framework that would protect market participants. Educational programs on derivatives should be developed and undertaken in Kenya to demystify derivative trading and its accounting and valuation procedure. This would mitigate against managers skepticism on such uses. The finance offices would also understand the disadvantages and advantages of each and every hedging practice. Most firms did not have a deliberate policy on derivative usage and management of financial risks is solely left on the devices and whims of managers which make investors incur agency costs. There is, thus, a need for organization wide policy on derivative use to act as an operation manual for the managers and firms' agents.

5.4 Suggestion for Further Research

This study on the effects of use of derivatives on financial performance of companies listed in the Nairobi Security Exchange **c**overed only 11 companies listed in Nairobi Security Exchange. There should be a study on other listed companies.

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