TESTING THE SMALL FIRM EFFECT ON STOCK MARKET RETURNS AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

This research Project is my original work and has not been presented in any other University.

Signed…… Date ……..

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This research Project has been submitted for examination with my approval as University Supervisor.

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DEDICATION

This project is dedicated to my dear family for their invaluable support and encouragement during my entire academic period and towards the success of this project.

ABSTRACT

The small firm effect in the cross-section of stock returns is a known asset pricing anomalies that indicates that stocks returns are a decreasing function of firm size. The small firm effect is realized when there are persistent abnormal stock returns obtained by small capitalization firms. The objective of the study was to test the existence of small firm effect on stock market returns at the Nairobi Securities Exchange. This study adopted a descriptive research design. The study used quartile portfolios that were arranged in ascending order according to market value and then divided into four portfolios, portfolio one containing the smallest firms and the fourth portfolio containing largest firms. The study used secondary data from the Nairobi Securities Exchange collected using data collection sheet which were edited, coded and cleaned. F-test, a non-parametric test of differences developed by Sir Williams Gosset was used in this study as a test of significance. From the analysis, it can be noted that Monthly returns had varying degrees but Small Sized Firms displayed a more positive influence on the monthly returns for the six year period at the NSE.The study concluded that Small Sized Firms have a significant positive influence on the Monthly Returns of companies at the NSE thus showing existence of small firm effect. The study recommends that Securities' management develop a policy so as to reduce the effects of firm size on the monthly returns.

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LIST OF ABBREVIATIONS

EMH – Efficient Market Hypothesis

IPO – Initial Public Offer

NASI – Nairobi All-Share Index

NYSE – New York Stock Exchange

NSE – Nairobi Securities Exchange Limited

RWH – Random Walk Hypothesis

U.S – United States

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Financial market anomalies are cross-sectional and time series patterns in security returns that are not predicted by a central paradigm or theory (Kuhn, 1970). They represent empirical results that are inconsistent with maintained theories of asset-pricing behavior. The small firm effect in the cross-section of stock returns is a known asset pricing anomalies that indicates that stocks returns are a decreasing function of firm size (Banz, 1981). It simply refers to the negative relation between security returns and the market value of the common equity of a firm. The small firm effect indicates that stock returns are a decreasing function of firm size such that larger firm stocks have lower returns than smaller firm stocks. Thus, the size of a firm and the return on its common stock are inversely related (Annaert & Combez, 2002). The small firm effect is realized when there are persistent abnormal stock returns obtained by small capitalization firms. This effect is however, hard to explain within the framework of efficient market. Banz(1981) was the first to document this phenomenon for U.S. stocks.

In the EMH, past stock prices should have no predictive power of future prices. An efficient market is one in whose prices fully reflect available information. This implies that in an efficient market no excess returns can be made from this information because current prices reflect the information. Even though there are some anomalies that cannot be explained by modern financial theory, market efficiency should not be totally abandoned in favor of behavioral finance. Many of the anomalies found in conventional theories could be considered shorter-term chance events that are eventually corrected over time (Fama, 1970).

Currently, the NSE is said to be the leading securities exchange in East Africa and one of the largest stock exchanges in Africa with the fourth largest trading volume across the continent. The NSE comprises of 4 major investments segments namely; Main Investment Market segments (requires a company to have a minimum of 1000 shareholders), Alternative Investment Market segment (which requires a company to

have a minimum of 100 shareholders), Fixed Income Securities Market segment and the Growth Enterprise Market Segment which was recently introduced to cater for small and medium sized firms. Over the years vast changes have taken place at the NSE including trading automation, increased listings among others resulting to increased efficiency and effectiveness in trading of securities (NSE, 2014).

1.1.1 Small Firm Effect

Cheung et all (1994) defines the small firm effect as the persistent abnormal stock returns obtained by small capitalization firms. Studies conducted have concluded that smaller firms in terms of market value of equity earn higher returns than larger firms of equivalent risk, where risk is defined in terms of market beta. Dimson and Marsh (1986) find that the annual returns on small stocks exceeded those of large stocks and refer to the anomaly as small firm effect. Banz (1981) who was the first to document the small firm effect observed that holding stocks of low capitalization companies earned excess returns. The study of small firm effect has several implications to the users of the findings. It can provide profitable strategies for companies and also test the market efficiency.

The size of a firm is measured in different ways. These measures include measurement by market capitalization, number of issued stocks and achieved volume and total assets. Market capitalization is calculated by multiplying the current stock price by the number of outstanding shares. This number gives the total value of the company. This basically gives what it would cost to buy the whole company on the open market. Oluoch (2003) adopts market capitalization to find a firm size at the NSE.Market capitalization is directly related to the stock price as it takes into account things that do not appear anywhere on the balance sheet. Total assets' represents the combined value of all assets owned by a company. Sehgal and Tripathi (2005) measure the size of firms in the Indian stock market using alternative measures of company size namely market capitalization, enterprise value, net fixed assets, net annual sales, total assets and net working capital.

1.1.2 Stock Returns

A stock return is a monetary gain or loss on an investment which is highly sensitive to both fundamentals and expectations in a market (Lee, 1998). It is the gain or loss of a security in a particular period consisting of the income and the capital gains relative on an

investment usually quoted as a percentage (Gartner, 1995). The performance of the stock market is influenced by a number of factors including the activities of governments' policies, political process and the general performance of the economy. Other factors that affect the stock market's performance include availability of other investments assets, change in composition of investors, economic activities and markets sentiments among other factors (Mishkin & White Eugene, 2002).

Stock market returns are calculated as percentage change in a market index based on the previous closing index. There are two methods that are usually used to calculate returns; simple returns and continuously compounded (logarithm) returns (Lee, 1998).

1.1.3 Small Firm Effect and Stock Returns

Small firms are said to experience abnormal returns because small stocks contain some systematic risks that are not adequately measured (Fama & French, 1996). Small firms are small because the market uses a high discount rate to capitalize its future cash flows, or because they have lost market values due to poor past performance (Berk, 1995). They are more likely to have cash flow problems and less likely to survive adverse economic conditions. Since these risks cannot be easily captured by empirical models, small stocks tend to exhibit a higher risk-adjusted return (Gomes, Kogan, & Zhang, 2003). Another popular explanation for the size effect, first investigated by Stoll and Whaley (1983) is based on liquidity where it is believed that larger stocks are generally more liquid, and investors are willing to compromise returns for higher liquidity. Therefore equilibrium returns of larger stocks are lower (Brennan, Chordia & Subrahmanya, 2005).

In addition to that, small companies are more concerned with building equity and gaining market share than large companies are. As a result, their earnings are distributed differently. A small company is more likely to reinvest its earnings back to the company causing the retained earnings to grow faster and increasing the value of common stock. However, a large company is more likely to use its earnings in ways that generally do not increase the value of its common stock e.g paying dividends to preferred stockholders. Since large companies are retaining a smaller percentage of their earnings than the small firms, the common stock is returning less to its owners (Moore, 2005)

1.1.4 Nairobi Securities Exchange

In Kenya, dealing in shares and stocks started in the 1920's when the country was still a British colony. In 1951, an Estate Agent by the name of Francis Drummond established the first professional stock broking firm. In 1954 the Nairobi Stock Exchange was then constituted as a voluntary association of stockbrokers registered under the Societies Act. Since Africans and Asians were not permitted to trade in securities, until after the attainment of independence in 1963, the business of dealing in shares was confined to the resident European community. At the dawn of independence, stock market activity slumped, due to uncertainty about the future of independent Kenya (NSE, 2014).

The year 1988 saw the first privatization through the NSE, of the successful sale of a 20% government stake in Kenya Commercial Bank. September 2006 realized the implementation of live trading on the automated trading systems of the Nairobi Stock Exchange (NSE, 2014). A Wide Area Network (WAN) platform was implemented in 2007 and this eradicated the need for brokers to send their staff (dealers) to the trading floor to conduct business. In 2008, the NSE All Share Index (NASI) was introduced as an alternative index. Its measure is an overall indicator of market performance. The Index incorporates all the traded shares of the day. Its attention is therefore on the overall market capitalization rather than the price movements of select counters (NSE, 2014).

The NSE marked the first day of automated trading in government bonds through the Automated Trading System (ATS) in November 2009. The automated trading in government bonds marked a significant step in the efforts by the NSE and CBK towards creating depth in the capital markets by providing the necessary liquidity. In December 2009, NSE marked a milestone by uploading all government bonds on the Automated trading System (ATS). Also in 2009, NSE launched the Complaints Handling Unit (CHU) SMS System to make it easier for investors and the general public to forward any queries or complaints to NSE (NSE, 2014). In July 2011, the NSE changed its name to the Nairobi Securities Exchange Limited. In September 2011 the NSE converted from a company limited by guarantee to a company limited by shares and adopted a new Memorandum and Articles of Association reflecting the change (NSE, 2014).

In November 2011 the FTSE NSE Kenya 15 and FTSE NSE Kenya 25 Indices were launched. The launch of the indices was the result of an extensive market consultation process with local asset owners and fund managers and reflects the growing interest in new domestic investment and diversification opportunities in the East African region. In March 2012 the delayed index values of the FTSE NSE Kenya 15 Index and the FTSE NSE Kenya 25 Index were made available on the NSE website. The new initiative gives investors the opportunity to access current information and provides a reliable indication of the Kenyan equity market's performance during trading hours. On June 27, 2014, The Capital Markets Authority proved the listing of the NSE stock through an IPO and subsequently self-list its shares on the Main Investment Market Segment. The IPO was set to open on July 24, 2014 and would run up to August 12, 2014.The listing will make the NSE join the Johannesburg Stock Exchange in being the only exchanges in Africa that are self-listed (NSE, 2014).

Several studies done at the NSE have posted mixed results in as far as the small firm effect is concerned. For instance, Oluoch (2003) did not to predict any existence or prevalence of the anomaly in the market while Lukale (2007) established that there was no significant relationship between the small firm effect and January effect at the NSE.

1.2 Research Problem

According to EMH, stock prices of securities fully reflect market information about the securities and as a result market participants cannot earn extra normal profits. However, the market anomalies studied have proved variations in volatility of stock returns. This denies the weak form of EMH inferring that the market is inefficient. If the investors and other market participants can identify a pattern in the returns volatility then it would be easier to make investment decisions based on return and risk of the stocks. The small firm effect implies that small firms achieve higher returns than large firms. Empirical studies have shown the existence of small firm effect in both developed and emerging markets. The studies include (Banz, 1981, Keim, 1981, Berges, McConnel and Schlanbaum, 1982, Brown, Kleidon and Marsh, 1983, Sehgal and Tripathi, 2005, Lakonishok and Smidt, 1986, Oluoch, 2003 and Lukale, 2007).

The NSE has witnessed massive changes which have revolutionalized the manner in which business is conducted. First, the market has witnessed technological changes which have increased the efficiency and effectiveness in trading. As a result, the trading hours have been increased. In addition, the number of firms listed at the NSE has increased to more than 60 compared to those listed eleven years ago (Oluoch, 2003). The new listings have presented different perspectives in stock returns on the market because of their diversified sizes. Some of these companies have also been merged or acquired by other organization like Access Kenya being acquired by Dimension Data and thereafter delisted. These changes have improved the performance of the NSE.

Various studies have been done to ascertain the existence of small firm effect on stock market returns at securities markets both local and international. Oluoch (2003) conducted a study aimed to determine whether size effect is experienced at the NSE. The findings did not to predict any existence or prevalence of the anomaly in the market. Keim (1983) analyzed the interrelationship of small firm and January effects at the NYSE. The result of the study was that the small firm effect was present but more pronounced in January in the market. Rathinasamy and Matripragada (1996) re-examined the January effect, small firm effect and the small firm January effect using data from the Centre for Research in Security Prices. The results showed that there was a January effect even after adjusting for risk and small firms do generate abnormal returns. Jacobsen, Mamun and Visaltanachoti (2005) carried out a study to investigate the interaction between the January effect on portfolios formed on the basis of size. The findings concluded that January effect plays an important role in explaining the small firm effect.

Lukale (2007) carried out an empirical investigation on interrelationship of small firm effect and January effect at the NSE. He established that there was no significant relationship between the small firm effect and January effect at the NSE. From the studies reviewed a study on existence of small firm effect at NSE was done more than eleven years ago. A lot of changes have taken place at the NSE including technological changes and new diversified listings among others, which necessitates research of the same study for a recent period to establish whether the findings still hold or have changed. This study will therefore seek to examine the existence of small firm effect on

stock market returns at the Nairobi Securities Exchange. To achieve this, this study sought to answer the research question: Does the small firm effect exist on stock market returns at the Nairobi Securities Exchange?

1.3 Objective of the Study

The objective of the study was to test the small firm effect on stock market returns at the Nairobi Securities Exchange.

1.4 Value of the Study

Research on the small firm effect will help academicians to narrow down the research gap in this area by conducting further research to uncover the existence of such an anomaly and draw conclusions of efficiency of the Kenyan stock market. It will also add to the richness in documentation in this field and build up on the existing theory.

The government can also use the information when formulating policies and tax regulations that would affect companies as a result of the small firm effect. The findings will also be beneficial to top management of companies as it can help in policy decision making and strategy so as to earn high returns in high as a result of investing in small firms if returns are predictable. Portfolio managers can use the information to know whether to buy or sell small stocks. Knowledge on seasonality in stock returns may be beneficial to the companies listed at the NSE and also private firms when they are planning on issuing new shares.

This study could provide information to consultants and stock brokers which will help them provide quality services to their clients. It could also prove useful to individual private investors who after studying the small firm effect can choose which stocks to buy. The information on the anomaly also opens up possibility of traders to formulate profitable trading rules based on the observed patterns. Traders are able to form portfolio and include small firms so as to achieve excessive profits.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter conducts a review of the literature on testing the size effect. From this review broad categories will be derived which will help easily identify the existence of small firm effect at the securities exchange. Specifically, the chapter addresses the theoretical framework guiding the study, empirical literature and summary of literature review.

2.2 Theoretical Review

The theoretical review section tries to uncover whether or not existing theories suggest that there exists size effects in a securities exchange. The section's main purpose is to establish a solid foundation for the empirical study, clarifying the underlying problems of the analysis.

2.2.1 The Efficient Markets Hypothesis (EMH)

The efficient markets hypothesis (EMH) maintains that market prices fully reflect all available information. Developed independently by Samuelson and Fama in the 1960s, the EMH states that in an informational efficient market, price changes must be unforecastable if they are properly anticipated, that is, if they fully incorporate the information and expectations of all market participants. Fama (1970) made a distinction between three forms of EMH; the weak form, the semi-strong form and the strong form. The strong form suggests that securities prices reflect all available information, even private information. The semi strong form of EMH asserts that the security prices reflect all publicly available information. There are no undervalued or overvalued securities and thus trading rules are incapable of providing superior returns. When new information is released, it is fully incorporated in the price rather speedily. The weak form of the hypothesis suggests that past prices on returns reflect future prices of securities. The existence of seasonality in stock returns however violates this important hypothesis in finance. Some of the seasonal anomalies reported include small firm effect, January effect, day of the week effect, turn of year, neglected firm, and holiday effect among others.

The most enduring critiques of the EMH revolve around the preferences and behaviour of market participants (Bell, 1982). The standard approach to modeling preferences is to assert that investors optimize additive time-separable expected utility functions from certain parametric families for example, constant relative risk aversion. However, psychologists and experimental economists have documented a number of departures from this paradigm, in the form of specific behavioral biases that are ubiquitous to human decision-making under uncertainty (Gervais and Odean, 2001), overreaction (DeBondt and Thaler, 1985), loss aversion (Odean, 1998), herding (Huberman and Regev, 2001), psychological accounting (Tversky and Kahneman, 1981), miscalibration of probabilities (Lichtenstein, and Phillips, 1982), hyperbolic discounting (Laibson, 1997), and regret (Bell, 1982). These critics of the EMH argue that investors are often irrational, exhibiting predictable and financially ruinous behaviour. These critics argue that there are several instances of recent market history where there is overwhelming evidence that market prices could not have been set by rational investors and that psychological considerations must have played the dominant role (Schwert, 2001). La Porta, Lakonishok , Shliefer and Vishny (1997) critic the EMH by arguing that the predictability of stock returns reflects the psychological factors, social movements, noise trading and fashions of irrational investors in a speculative market.

2.2.2 Random Walk Hypothesis

This hypothesis was introduced by Kendall (1953) and later confirmed by Fama (1991). It states that stocks move randomly because stock markets are efficient and that future prices are not predictable on the basis of past prices implying that stock price changes are unpredictable. The random walk hypothesis is a direct consequence of the EMH. The EMH predicts that security prices follow a random walk; it should be impossible to predict future returns based on publicly available information and past price behaviors. The importance of the EMH stems primarily from its sharp empirical implications many of which have been tested over the years. Much of the EMH literature before Leroy (1973) and Lucas (1978) revolved around the random walk hypothesis (RWH) and the martingale model, two statistical descriptions of unforecastable price changes that were initially taken to be implications of the EMH.

One of the first tests of the RWH was developed by Cowles and Jones (1937), who compared the frequency of sequences and reversals in historical stock returns, where the former are pairs of consecutive returns with the same sign, and the latter are pairs of consecutive returns with opposite signs. In addition to that, Lo and Mackinlay (1999) finds that short run serial correlations are not zero and that the existence of too many successive moves in the same direction enable the rejection of the hypothesis that stock prices behave as random walks. Economists and psychologists in the field of behavioral finance find such short run momentum to be consistent with psychological feedback mechanisms. Normally, individuals see stock price rising and are drawn into the market in a bandwagon effect.

The logic of the random walk idea is that if the flow of information is uninterrupted and information is immediately reflected in stock prices, then tomorrow's price change will reflect only tomorrow's news and will be independent of the price changes today (Fama, 1991). But news is by definition unpredictable, and, thus, resulting price changes must be unpredictable and random. As a result, prices fully reflect all known information, and even uninformed investors buying a diversified portfolio at the tableau of prices given by the market will obtain a rate of return as generous as that achieved by the experts (Panas, 1990).

2.3 Determinants of Stock Returns for Listed Firms

Empirical studies on determinants of stock market returns on emerging economies have indicated that there exists a host of factors that influence stock returns. In the literature from time series or cross sectional analysis, interest rates, exchange rates, inflation rate, money supply and firm beta, firm size, book-to-market equity ratio, equity-to-price ratio, debt management ratios, activity and profitability ratios are found to significantly explain stock returns.

2.3.1 Market Anomalies

Financial market anomalies are defined by Kuhn (1970) as cross-sectional and time series patterns in security returns that are not predicted by a central paradigm or theory. Documentation of anomalies often presages a transitional phase toward a new paradigm. These anomalies have been regarded as strong evidence against Efficient Market Hypothesis (EMH) in financial economics (Fama, 1991). Some of these anomalies include; The Small Firm effect, The Low PE ratio effect, Low-Priced Stocks, Neglected Firm Effect, Market overreaction, The January effect, The Weekend effect, The Persistence of Technical Analysis, The day of the week effect, the holiday effect, the weather effect, IPO's, Seasoned Equity Offerings, Price Book Value Ratios and Stock Buy outs and Final Thoughts effect.

2.3.2 Macro Economic Variables

An empirical study conducted by Eita (2011) isolated several macroeconomic variables which influence stock returns. The study concluded that the prices of the stock market in Namibia are determined by their macroeconomic variables including inflation, interest rate, money supply and exchange rate. Specifically, the investigation revealed a positive relationship between stock market prices on one hand, and money supply, economic activity on the other hand. In addition, decreases in stock market prices increases inflation. An increase in interest rates causes stock prices to be reduced; hence, higher interest rates would make discounted cash flows less worthy. The effect will be decrease in investment, and reduced stock market returns (Eita, 2011).

2.3.3 Elections and Political Stability of a country

Studies have been done on the effects of elections on prices at the NSE. Murigi (2008) states that the financial and investment sector experiences remarkable change in security prices during elections years under observations. The study observed that there was a negative relationship between securities in this segment and the elections. The findings are attributed to most investors being uncertain on the performance and economic policies of the new administration. The study indicates that returns on securities improved positively in the early months preceding elections largely because of the

improved activity in the sector as people settle down to proceed with various economic activities. A closely related study by Miya (2007) states that during election period, the share prices go down but after election they start rising once again or remain relatively stable.

2.3.4 Information related to a company

Positive news about a company can increase buying interest in the company while negative press can ruin the prospect of a stock. However in some cases, despite amazingly good news, can show least movement. Thus, it is the overall performance of the company that matters more than news (Pandey, 1995).

2.4 Empirical Evidence

Banz (1981) studied the stocks quoted on NYSE from 1926 to 1980 using market capitalization of the stocks. The stocks were grouped into 5 equal groups and regression analysis was used to estimate return of the groups. The findings depicted that risk adjusted stocks returns are a decreasing function of firm size such that larger stocks have lower returns than smaller firms stocks. The returns for the small firms proved to be higher. Banz(1981) suggests that size may be a proxy for other factors like neglected firm effect that were not tested in the model.

Keim (1983) conducted a study between 1963-1979 and examined month-by-month, the empirical relation between abnormal returns and market values of NYSE and AMEX common stocks. The evidence provides the relation between abnormal returns and size is always negative and more pronounced in January than any other month. Keim ranked all sample firms on the market value of their common equity. The market values were computed by multiplying the number of shares of common stock outstanding at the year-end by the price of the firms' common shares. The sample was divided into 10 portfolios on the basis of size, portfolio one containing the smallest firms and the tenth containing largest firms.

Berges, McConnell and Schlarbaum (1984) examined monthly returns to 391 stocks traded on the Toronto and Montreal Stock Exchanges from 1950 through 1980. The study

estimated average returns to five portfolios ranked on the market values of outstanding stock. The findings indicate higher average returns in January especially for small firms stocks.

Brown, Kleidon and Marsh (1983) examined the behavior of size effect over time. The study used data from 1967-1979 and found that the risk-adjusted average returns to portfolio ranked on size are linearly related to the logarithm of the size variable, but that the magnitude and sign of that relation are not constant within that period. The size effect seemed to imply a negative excess return for small firm stocks between 1969-1973 and a positive excess returns between 1974-1979.

Lakonishok and Smidt (1986) used the daily stock data of the Chicago tape for the period 1970-1981. They divided the stocks into 10 deciles and calculated daily returns over the last 5 days and the first 4 days around the turn of the year using three methods of calculating daily return; CRSP return, close to close, and open to open. Their findings were that the returns of small companies are high around the turn of the year and are higher than the returns of large firms.

Sehgal and Tripathi (2005) attempted a test of the size effect in the Indian stock market. The data comprised of 482 top Indian companies for the period 1990-2003. The evidence finds a strong size premium using alternative measures of company size namely market capitalization, enterprise value, net fixed assets, net annual sales, total assets and net working capital. The presence of a strong size premium raises doubt about informational efficiency of the India equity market.

Jayen (2012) conducted a study to compare recent performance of small firms with that of large firms in developed and emerging stock markets. T-tests were utilized to test the differences in returns between the stock prices. ANOVA analysis and median test statistics were conducted to test differences in size premiums over the years. It was found that small firm did not generate significantly different returns than large firm in recent years. The results indicate stock markets no longer exhibit a size effect or a reverse size effect.

In Kenya, Oluoch (2003) conducted a study aimed to determine whether the small size effect is experienced at the NSE. The study utilized the firms quoted at the equity section of the NSE and used OLS regression. The findings did not predict the prevalence of the anomaly at the market. However, descriptive mean statistics indicate that small firms have higher mean returns than the medium sized firms, the large firms and the market on average.

Lukale (2007) examined interrelationship of size effect and January effect at the Nairobi Stock Exchange (NSE): an empirical investigation. The study covered a period of eight years (1999-2006). A sample size of 46 companies was selected from a total of 54 companies that were listed at the NSE then. Monthly returns were calculated for the ten portfolios formed on the basis of size. Lukale (2007) notes that the size effects indicate that the stocks returns are a decreasing function of firm size whereas the January effect is situation where stock returns in January are higher than the average return in any other month.

2.5 Summary of Literature Review

This chapter has presented literature as reviewed by other scholars and researchers on subjects related to the existence of small firm effect on stock market returns at the Nairobi Securities Exchange. Existing studies (Banz, 1981, Keim, 1983; Berges, McConnell and Schlarbaum, 1982; Brown, Kleidon and Marsh, 1983; Lakonishok and Smidt, 1986; Sehgal and Tripathi, 2005; Jayen, 2012) have been done on international arena studied the stocks quoted on NYSE from 1926 to 1980 using market capitalization of the stocks. Locally, a number of studies have been done (Oluoch, 2003 and Lukale, 2007). The studies reviewed in developing economies pay little attention to emerging security markets of Africa particularly the NSE. There are also mixed results reported regarding the anomaly. It is therefore necessary to conduct extensive study on the market anomalies and in particular, the small firm effect at the NSE so as to make clear drawings and enable the industry players make informed investment decisions.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a description of the research design, the population, and Sample population, sampling procedure, how the subjects were obtained and the rationale for their selection, types of data, data collection instruments and finally the analysis of the data.

3.2 Research Design

This study adopted a descriptive research design. According to Mugenda and Mugenda (2003), a descriptive research design determines and reports things the way they are. Creswell (2003) also observed that a descriptive research design is used when data is collected to describe persons, organizations, settings or a phenomenon. The research design was ideal for this study as it was carried on firms listed at the NSE and data was readily available for comparison. Therefore, descriptive research design best answered the research question.

3.3 Population of the Study

The total population consisted of all 62 companies listed at the equity section of the NSE as at 31 December 2013.

3.4 Sample Size and Technique

The study used quartile portfolios as used by Berk (1997). The listed companies were arranged in ascending order according to market value and then divided into four portfolios, portfolio one containing the smallest firms and the fourth portfolio containing largest firms. The two middle portfolios were be dropped. By eliminating the middle portfolios a wide gap was created which ensuring significant difference between the two size classes. It is the most efficient way to reduce cross over bias (Moore, 2005).

3.5 Data Collection

This study used NASI (Nairobi Securities Exchange All Share Index) which was introduced in 2008 thus using secondary data for the years 1st January 2008 to 31st

December 2013. This information was obtained at the Nairobi Stock Exchange library and from the respective companies. Data on the monthly market share prices was obtained from the share prices as reported by the N.S.E.

3.6 Data Analysis

In order to test the small firms' effect for the listed firms at the Nairobi Securities Exchange, a regression analysis was conducted.

$$R_{T=}\alpha+\beta_1 S_S+\beta_2 S_L+\varepsilon_T$$

Where R_T represents monthly returns, α is the model intercept, β represents the size coefficients, S_S represents small sized firms, S_L represents the large sized firms and ε_t the error term.

For each of the years, the size variable was determined by market capitalization of the listed firms. The lower quartile represented the small firms while the upper quartile represented the large firms.

3.6.1 Operationalization of the variables

To determine size the researcher adopted market capitalization as used by Oluoch (2003). The size was calculated by total number of outstanding shares x market value of quoted shares.

The monthly stock prices were transformed into monthly returns using the following formula:

$$R_{it} = (P_{it+1} - P_{it}) / P_{it}$$

Where:

R_{it} = Return on stock i for month t, where t = 1, 2 ……12.

P_{it} = Market price of stock i at the beginning of the month.

P_{it+1}= Market price of stock i at the end of the month.

The monthly returns were used because daily returns have been shown to overstate the small firm effect (Blume, 1980).

3.6.2 Tests of significance

The T-test was used to verify the significance between the average returns of small and large firms by testing the coefficients of the variables individually. The F-test was conducted to test the overall fit of the model.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents analysis, findings and discussion of the study on the existence of small firm effect on stock market returns at the Nairobi securities exchange.

4.2 Regression Results

A cross-sectional multiple regression was conducted on the listed firms at the NSE in terms of small sized firms and large sized firms with Returns on stock consolidated over the period of 2008–2013.

4.2.1 Coefficient of Determination

Table 4. 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.951[a]	.904	.875	.26839

Coefficient of determination explains the extent to which changes in the dependent variable (Returns) can be explained by the change in the independent variables or the percentage of variation in the dependent variable (Returns) that is explained by the two independent variables (Small sized Firms and Large Sized Firms). The two independent variables that were studied, explain 87.5% of variation in Returns as represented by the R^2. This therefore means that other factors not studied in this research contribute 12.5% of variation in the dependent variable.

4.2.2 Analysis of Variance (ANOVA)

In order to establish the strength of the model in explaining the relationship between the dependent variable (Returns) and the independent variables (Small sized Firms and Large

Sized Firms), the study conducted an Analysis of Variance (ANOVA). The findings were as shown in the Table 4.3 below:

Table 4.2: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.309	2	.654	9.909	.012[b]
Residual	12.182	183	.066		
Total	13.490	185			

The significance value is also less than 0.05, thus indicating that the predictor variables, (Small sized Firms and Large Sized Firms) explain the variation in the dependent variable which is stock market returns at the Nairobi Securities Exchange.

4.2.3 Regression Coefficients

Table 4.3: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	.562	.215		2.617	.010
Small sized Firms	.014	.007	.142	1.938	.004
Large Sized Firms	.004	.007	.048	.655	.013

From the regression findings, the substitution of the equation:

$$\mathbf{R_T = 0.562 + 0.014S_S + 0.004S_L + 0.215}$$

$$\mathbf{R_T = 0.777 + 0.014S_S + 0.004S_L}$$

Where R_T is the dependent variable (Returns), S_S is Small sized Firms and S_L is Large Sized Firms.

According to the regression coefficient Table 4.4, taking all factors (Small sized Firms and Large Sized Firms) constant at zero, stock market returns will have an autonomous

value of 0.562. The findings presented also show that taking all other independent variables at zero, a unit increase in Small sized Firms would lead to a 0.014 increase in the stock market returns, a unit increase in Large Sized Firms would lead to a 0.004 increase in stock market returns. These findings also show Small sized Firms affect positively affect returns more.

The test of significance was carried out using the T-test which produced values of less than 0.05 implying significance of all the variables individually. To test the overall fit of the model the F-test was conducted. The value of F critical at 5% level of significance was 9.909. Since F calculated is greater than the F critical (value = 3.34), this shows that the overall model was therefore significant.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes the findings of the study. It presents the findings obtained and recommendations thereafter. It also highlights the limitations encountered during the study and gives suggestions for further study.

5.1 Summary of Findings

The objective of this study was to investigate the existence of small firm effect at the NSE. To achieve this objective, monthly returns were calculated for two portfolios formed on the basis of size for each year to represent small and large firms. The study has presented evidence of the existence of small firm effect on stock market returns at the NSE by displaying a significant value for the small firms. The coefficient of determination also implies that other factors other than size could have contributed to the varying change on the stock market returns.

5.2 Conclusion

This study concludes that there is small firm effect at the NSE. This can be explained by the fact that over the 6-year period there is a certain degree of positive change on stock returns based on small size. It is possible that the NSE market is still very small having only sixty two (62) quoted companies. Due to its size, the market is dominated by a few well informed investors or brokers. Thus, investors' expectations have little influence on stock prices and returns. This conclusion implies that investors could be better off on average by choosing to invest in small sized company. This could mean that the NSE is not an efficient market. This is because the size of the company seems to impact on stock returns and therefore investors can use size and its proxies to estimate stock returns. It therefore, maybe necessary for investors to consider whether to invest in the stocks of small or large sized firms.

5.3 Limitations of the Study

Dividends were ignored in calculating the stock market returns. This could have posed a risk of underestimation of total returns.

The NSE is still considered a small sized market having a total of sixty two (62) listed companies when compared to other markets in which similar studies have been carried out. The related researches have been conducted on large stock markets and thus it might be probable that the small size of the market contributed to the results obtained in this study.

The study covered a period of eight years from 1 January 2008 to 31 December 2013. This was due to lack of availability of data for the previous years as NASI was introduced as an alternative index in the year 2008. Previous studies on small firm effect have used longer periods such as 50 years (Banz, 1981) and (Keim, 1983) 17 years. As a result, the shortened period could have affected the findings of the study.

5.4 Recommendations for Policy

The recommendation for this study is that investors should consider buying stocks from firms with small capitalization since they can earn higher returns that are not commensurate with the risk. However, The Securities' management could develop a policy so as to reduce the effects of firm size on the monthly returns.

5.5 Suggestion for Further Research

It is suggested that dividends need to be included when calculating the market returns. This will enable the researcher deal with returns that are reflecting the same thus ensuring no underestimation of total returns. It is also important that a similar study is conducted for a longer period to examine the behavior of the market returns over the many years. It is possible that a longer period could register different results.

In computation of size, alternative measures to market capitalization could be used. A model that uses asset values can be used to distinguish between small and large size firms. Such a model was used by Moore (2005) where he used total assets value to represent firm size. A similar research can also be conducted using value added portfolios to investigate whether the results will be any different. Mamun and Visaltanachoti (2005) in their study did not find evidence of a small firm effect in equally weighted portfolios and a reversed small firm effect in value weighted portfolios. Value weighted portfolios assign relatively less weight to the smaller firms in the different quartile portfolios.

Further research can also be conducted to investigate why small firms tend to generate higher returns at the securities markets. This will explain the occurrence of the small firm effect at the NSE.

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APPENDIX I

LIST OF THE NASI CONSTITUENT COMPANIES AS AT DECEMBER 2013

MANUFACTURING AND ALLIED	AGRICULTURAL	AUTOMOBILES AND ACCESSORIES
B.O.C Kenya Ltd Ord 5.00 British American Tobacco Kenya Ltd Ord 10.00 Carbacid Investments Ltd Ord 5.00 East African Breweries Ltd Ord 2.00 Mumias Sugar Co. Ltd Ord 2.00 Unga Group Ltd Ord 5.00 Eveready East Africa Ltd Ord.1.00 Kenya Orchards Ltd Ord 5.00 A.Baumann CO Ltd Ord 5.00	Eaagads Ltd Ord 1.25 Kapchorua Tea Co. Ltd Ord Ord 5.00 Kakuzi Ord.5.00 Limuru Tea Co. Ltd Ord 20.00 Rea Vipingo Plantations Ltd Ord 5.00 Sasini Ltd Ord 1.00 Williamson Tea Kenya Ltd Ord 5.00	Car and General (K) Ltd Ord 5.00 CMC Holdings Ltd Ord 0.50 Sameer Africa Ltd Ord 5.00 Marshalls (E.A.) Ltd Ord 5.00
BANKING	**COMMERCIAL AND SERVICES**	**CONSTRUCTION AND ALLIED**
Barclays Bank Ltd Ord 0.50 CFC Stanbic Holdings Ltd ord.5.00 I&M Holdings Ltd Ord 1.00 Diamond Trust Bank Kenya Ltd Ord 4.00 Housing Finance Co Ltd	Express Ltd Ord 5.00 Kenya Airways Ltd Ord 5.00 Nation Media Group Ord. 2.50 Standard Group Ltd Ord 5.00 TPS Eastern Africa	Athi River Mining Ord 5.00 Bamburi Cement Ltd Ord 5.00 Crown Berger Ltd 0rd 5.00 E.A.Cables Ltd Ord 0.50 E.A.Portland Cement Ltd Ord 5.00

Ord 5.00 Kenya Commercial Bank Ltd Ord 1.00 National Bank of Kenya Ltd Ord 5.00 NIC Bank Ltd 0rd 5.00 Standard Chartered Bank Ltd Ord 5.00 Equity Bank Ltd Ord 0.50 The Co-operative Bank of Kenya Ltd Ord 1.00	(Serena) Ltd Ord 1.00 Scangroup Ltd Ord 1.00 Uchumi Supermarket Ltd Ord 5.00 Hutchings Biemer Ltd Ord 5.00 Longhorn Kenya Ltd	**TELECOMMUNICATION AND TECHNOLOGY** Safaricom Ltd Ord 0.05 **GROWTH ENTERPRISE MARKET SEGMENT** Home Afrika Ltd Ord 1.00
ENERGY AND PETROLEUM KenolKobil Ltd Ord 0.05 Total Kenya Ltd Ord 5.00 KenGen Ltd Ord. 2.50 Kenya Power & Lighting Co Ltd Umeme Ltd Ord 0.50	**INSURANCE** Jubilee Holdings Ltd Ord 5.00 Pan Africa Insurance Holdings Ltd 0rd 5.00 Kenya Re-Insurance Corporation Ltd Ord 2.50 Liberty Kenya Holdings Ltd British-American Investments Company (Kenya) Ltd Ord 0.10 CIC Insurance Group Ltd Ord 1.00	**INVESTMENT** Olympia Capital Holdings ltd Ord 5.00 Centum Investment Co Ltd Ord 0.50 Trans-Century Ltd

APPENDIX II

MARKET CAPITALIZATION

2008			
SMALL FIRMS	**SH '000**	**LARGE FIRMS**	**SH'000**
Hutchings Biemer Ltd	7,290	Diamond Trust Bank Kenya	11,168,042
Kenya Orchards Ltd	38,604	NIC Bank Ltd	12,906,119
A.Baumann & Co.Ltd	42,625	British American Tobacco	13,100,000
Limuru Tea Co. Ltd	183,000	Kenya Airways Ltd	13,156,041
Kapchorua Tea Co. Ltd	266,016	CFC Stanbic Holdings Ltd	16,421,053
Eaagads Ltd	293,433	Nation Media Group	20,535,915
Marshalls (E.A.) Ltd	388,614	KenGen Ltd.	34,844,029
Olympia CapitalHoldings	400,000	The Co-operative Bank of Kenya	38,546,133
Kakuzi	450,800	Standard Chartered Bank Ltd	43,514,850
Express Ltd	460,249	Kenya Commercial Bank Ltd	52,117,778
Crown Berger Ltd	587,243	Bamburi Cement Ltd	59,888,280
Williamson Tea Kenya	709,266	Equity Bank Ltd	65,168,876
Eveready East Africa Ltd	735,000	Barclays Bank Ltd	68,573,142
Rea Vipingo Plantations	837,000	East African Breweries Ltd	113,871,507
Unga Group Ltd	858,034	Safaricom Ltd	144,000,000
2009			
Hutchings Biemer Ltd	7,290	Kenya Power & Lighting	11,077,920
Kenya Orchards Ltd	38,604	Diamond Trust Bank Kenya	11,412,598
A.Baumann & Co.Ltd	42,625	CFC Stanbic Holdings Ltd	12,315,789
Olympia CapitalHoldings	260,000	Kenya Airways Ltd	16,502,754
Express Ltd	285,001	Nation Media Group	16,828,041
Marshalls (E.A.) Ltd	313,050	British American Tobacco	17,800,000
Eaagads Ltd	321,570	KenGen Ltd	28,358,863
Kapchorua Tea Co. Ltd	336,432	The Co-operative Bank of Kenya	31,317,947
Limuru Tea Co. Ltd	366,000	Standard Chartered Bank	43,786,817
Crown Berger Ltd 0rd	569,448	Kenya Commercial Bank	45,464,444
City Trust Ltd	601,473	Equity Bank	53,134,850
Eveready East Africa Ltd	609,000	Bamburi Cement	56,621,647
Kakuzi	622,300	Barclays Bank Ltd	61,104,780
Unga Group Ltd	681,380	East African Breweries	114,662,282
Rea Vipingo Plantations	690,000	Safaricom Ltd	182,000,000
2010			
Hutchings Biemer Ltd	7,290	Athi River Mining	18,127,065

Kenya Orchards Ltd	38,604	CFC Stanbic Holdings	20,663,158
A.Baumann & Co.Ltd	42,625	Kenya Airways Ltd	21,234,312
Marshalls (E.A.) Ltd	202,943	Diamond Trust Bank Kenya	22,010,010
OlympiaCapitalHoldings	238,000	Nation Media Group	26,238,802
Express Ltd	276,150	British American Tobacco	27,000,000
Limuru Tea Co. Ltd	360,000	KenGen Ltd	37,372,145
Kapchorua Tea Co. Ltd	391,200	Kenya Commercial Bank Ltd	64,166,179
Eveready East Africa Ltd	630,000	The Co-operative Bank of Kenya	66,355,028
Eaagads Ltd	803,925	Bamburi Cement Ltd	67,873,384
Unga Group Ltd	832,798	Standard Chartered Bank Ltd	74,065,900
Crown Berger Ltd	854,172	Barclays Bank Ltd	84,867,750
City Trust Ltd	916,530	Equity Bank Ltd	99,049,285
Rea Vipingo Plantations	1,047,000	East African Breweries Ltd	158,945,646
Car & General (K) Ltd	1,047,142	Safaricom Ltd	188,000,000

2011

Hutchings Biemer Ltd	7,290	KenolKobil Ltd	14,644,024
Kenya Orchards Ltd	38,604	Athi River Mining	15,650,690
A.Baumann & Co Ltd	42,625	Diamond Trust Bank Kenya Ltd	17,705,830
Olympia Capital Holding	128,000	KenGen Ltd	18,576,154
Express Ltd	138,075	Nation Media Group	21,996,600
Marshalls (E.A.) Ltd	179,914	British American Tobacco K	24,600,000
Eveready East Africa	367,500	Kenya Power & Lighting Co	30,442,886
Limuru Tea Co. Ltd	402,000	Co-operative Bank of Kenya L	42,781,544
Crown Berger Ltd	486,404	Bamburi Cement Ltd	45,369,909
Kapchorua Tea Co. Ltd	489,000	Standard Chartered Bank	45,932,341
Eaagads Ltd	538,630	Kenya Commercial Bank	50,021,845
Unga Group Ltd	681,380	Equity Bank	60,725,543
Car & General (K) ltd	760,292	Barclays Bank	70,881,545
Rea Vipingo Plantations	867,000	Safaricom	118,000,000
AccessKenya Group Ltd	1,071,634	East African Breweries	136,013,189

2012

Hutchings Biemer ltd	7,290	KenolKobil Ltd	19,942,364
Kenya Orchards Ltd	38,604	NIC Bank Ltd	20,769,144
A.Baumann & Co Ltd	42,625	Athi River Mining	22,039,738
Express Ltd	123,913	Diamond Trust Bank Kenya Ltd	25,311,511
Olympia CapitalHoldings	136,000	Kenya Power & Lighting Co	33,370,086
Marshalls (E.A.) Ltd	204,382	Nation Media Group	34,880,323
Eveready East Africa Ltd	430,500	British American Tobacco Kenya	49,300,000
Kapchorua Tea Co. Ltd	461,616	The Co-operative Bank of Kenya	52,804,648

Limuru Tea Co. Ltd	516,000	Bamburi Cement Ltd	67,147,466
Longhorn Kenya Ltd	596,700	Standard Chartered Bank	72,652,486
Car & General (K) Ltd	802,066	Barclays Bank Ltd	85,546,692
Eaagads Ltd	803,925	Equity Bank Ltd	87,940,954
AccessKenya Group Ltd	915,571	Kenya Commercial Bank	88,364,928
Unga Group	988,001	Safaricom Ltd	202,000,000
Crown Berger Ltd	1,008,398	East African Breweries	209,555,204
2013			
Hutchings Biemer Ltd	7,290	NIC Bank Ltd	32,579,049
Kenya Orchards Ltd	38,604	CFC Stanbic Holdings	34,392,983
A.Baumann & Co Ltd	42,625	Diamond Trust Bank Kenya Ltd	42,259,218
Express Ltd	138,075	ARM Cement Ltd	44,574,750
Marshalls (E.A.) Ltd	172,717	I&M Holdings Ltd	47,083,444
OlympiaCapitalHoldings	184,000	Nation Media Group Ord. 2.50	59,202,278
Kapchorua Tea Co. Ltd	489,000	British American Tobacco Ken	60,000,000
Eveready East Africa	567,000	Co-operative Bank of Kenya	74,387,500
Limuru Tea Co.	600,000	Bamburi Cement	76,221,448
Eaagads Ltd	763,729	Standard Chartered Bank	93,984,492
Longhorn Kenya Ltd	789,750	Barclays Bank Ltd	95,595,034
Car & General (K) Ltd	1,002,583	Equity Bank Ltd Ord 0.50	113,860,393
Unga Group Ltd	1,362,760	Kenya Commercial Bank Ltd	141,000,474
Sameer Africa Ltd	1,461,298	East African Breweries Ltd	229,324,563
Rea Vipingo Plantations	1,650,000	Safaricom Ltd	434,483,921