THE EFFECT OF STOCK SPLITS ON STOCK RETURNS OF FIRMS LISTED AT NAIROBI SECURITIES EXCHANGE

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

OCTOBER 2015

DECLARATION

This research project is my original work and has not been presented to any other institution of higher learning.

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D61/69308/2013

This research project has been submitted for examination with my approval as the University supervisor

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ACKNOWLEDGEMENTS

This research project could not have been possible without the valuable input of a number of groups whom I wish to acknowledge. First and foremost, great thanks to God for His grace and the gift of life during the period of the study.

Special appreciation goes to my supervisor Mr. Herrick Ondigo. I wish to sincerely acknowledge his professional advice and guidance in the research project. Thanks to the entire academic staff of the school of business for their contribution in one way or another.

I am thankful to the NSE staff for the invaluable assistance during the period of data collection. To my family and friends for their moral support and encouragement during the study, to all of you, kindly accept my appreciation for your great support.

DEDICATION

I wish to dedicate this project to my family especially to my daughter Doreen Wanjiku who encouraged me when writing this project at the same time expecting her needs to be met.

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LIST OF ABBREVIATION AND ACRONYMS

ADRs	American Depository Receipts
AR	Abnormal return
CAR	Cumulative abnormal returns
CMA	Capital Markets Authority
DPS	Dividend per Share
EMH	Efficient Market Hypothesis
KES	Kenya Shillings
NASI	NSE All-share Index
NR	Normal Return
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Squares

ABSTRACT

Stock split is an action by which a company lowers the face value of its stocks, simultaneously increasing the number of outstanding shares, but keeping the company's total capital base intact. Over the years the relationship between stock splits and stock returns has been a subject of continuing interest to economists and practitioners. The objective of this study is to determine the effect of stock splits on stock returns of firms listed at the Nairobi Securities Exchange. An event study research design was used. This study focused on 14 firms that have spilt their stocks between the years 2004 and 2014. However, the study managed to collect secondary data from seven (7) firms out of 14 firms that had split their stocks in the study period (2004-2014). This represents a response rate of 50% which was considered reliable for making generalizations of the whole population. The event window consisted of 61 days. Share price index for 30 day pre and 30 day post-split announcement date was used. The study found that stock-splits impacts positively on stock returns, the findings observed that four companies reacted positively to stock splits in the event period. The study recommends that since stock split is a new phenomenon in the Kenyan market, capital markets authority should encourage listed firms to split their stocks to boost their stock returns. The study also recommends that local and international investors should be educated about trading at NSE in an attempt to encourage long-term investments other than short-term. This will help firms to minimize abnormal reaction of prices caused by speculative trading by retail investors. Future researchers interested in this field of study should consider covering a longer event period to establish whether they will get similar results.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Corporations issuing stocks and investment companies trading stocks face the challenge of providing securities that can be purchased by a wide variety of investors who wish to diversify their investment risk. Companies have used stock splits of shares whose price is increasing to attract a broader base of shareholders. For existing shareholders, the effect of the split is attractive, as their proportionate ownership is the same after the split as before, and the company's cash flows are unaffected (Smith and Whaley, 2003).

Over the years the relationship between stock splits and stock returns has been a subject of continuing interest to economists and practitioners. Stock splits have long been a puzzling phenomenon to financial economists. They usually occur after an increase in stock prices and usually elicit a positive stock price reaction upon the announcement. The reaction occurring after the announcement, however, has not been fully understood and explained. Brooks and Su (2003) emphasizes that stock splits must accrue some benefits, either real or perceived, that results from a firm splitting its stock. If stock splits of common shares are nothing more than a cosmetic change and have no impact on the value of the firm, why do a large number of such splits occur every year.

Gray et al. (2003) reiterates that a stock split is a decision by the board of directors of a company to add the number of shares outstanding by issuing more shares to the existing shareholders. A stock split leads to an increase in the number of shares in a publicly listed firm. Easley and Saar (2001) argues that with a split, each old share is split into a number of new shares with a reduced par value and thus the total share capital is unchanged. By stock split, each and every stock holder gets additional stock without necessarily paying to the issuing firm. This is in line with the signaling hypothesis. It is based on the information asymmetry between firm managers and the investors. Proponents suggest that managers convey the earnings prospects of their firms through the announcement of stock splits. Fama et al. (2002) puts forth that stock split decision signals a dividend hike as well as indirect management's optimism on the firm's earnings prospects.

1.1.1 Stock Splits

Brooks and Su (2003) defines a stock split as an action by which a company lowers the face value of its stocks, simultaneously increasing the number of outstanding shares, but keeping the company's total capital base intact. With a stock split, the number of shares is increased through a proportion reduction in the par value of the stock. Similarly with a stock dividend the par value is not reduced whereas with a split it is. A stock split is usually reserved for occasions when a company wishes to achieve a substantial reduction in the market price per share. The principal purpose is to place the stock in a more popular trading range. The stock of a super-growth company may not sell quickly at several hundred dollars a share. Usually it is split periodically. The total number of shares increases accordingly, and price falls to a popular trading range (Gray et al., 2003).

Chaudhuri and Wu (2004) maintain a stock split results in a reduction of the par value and a consequent increase in the number of shares proportionate to the split. Theoretically, shareholders receive no tangible benefit from a stock split, while there are some costs associated with it. Splits are at one level only cosmetic change, slicing the same pie into smaller pieces but not changing an investor's fractional ownership of the equity interest and votes in the company. This means that if managers could increase share prices by splitting their firm's stock, both overvalued and undervalued firms will choose to split their shares, eliminating the informational content of the decision. Many financial economists in the stock market feel that splitting the shares of a stock produces, for various reasons, a greater total market value for the shares outstanding.

1.1.2 Stock Return

A stock return is an increase in share prices; Brennan and Hughes (1991) define share price as the price of a particular firm’s shares at a particular time. Share price is an indicator about the health of the company. Increased profits, for example, will drive the stock price up; excessive debt, for example, will drive it down. The share price has a profound effect on the company overall perfomance: for example, a declining share price will make it hard to secure credit, attract further investors, build partnerships, Also, when employees are often holding stock options, a declining share price can severely dampen morale. In an extreme case, if the share price declines too far, the company can be delisted from the stock market.

The value of a share is based on the performance of the company. So while the management may not have any control over price in the short term, poor performance in the long term may be an indication that management is not performing up to standard and in some extreme cases shareholders can overthrow current management in a proxy battle. Thus, the management of the firm is concerned about the share price since it reflects the performance of the firm (Baker and Gallagher, 1998).

1.1.3 The Effect of Stock Splits on Stock Returns of Listed Firms

Brennan and Copeland (2001) argue that signaling model submits that managers may communicate positive information to the market by means of a stock split. A survey of corporate managers by Chen and Kim (2011) indicated that the reasons for undertaking a split is to bring the stock price into better trading range and boost its liquidity position. Most corporate managers believe that low stock prices give small traders an opportunity to purchase round lots. A survey conducted by Gray, Smith and Whaley (2003) indicate that most firms are becoming less likely to pay dividends and consequently firms might be relying on the stock splits to effectively manage the share prices if stock repurchases leads to high prices.

Chen and Kim (2011) notes that the number of small orders rises as results of a stock split, the bulk of these orders are buys. A study conducted by Chaudhuri and Wu (2004) provides that trading activity by small investors rises following a stock split. In reference to the signaling hypothesis, managers implement stock splits in order to communicate private information about the firm's prospects.

A study by Chaudhuri and Wu (2004) found that a positive relationship exists between stock splits and share prices. The findings depict that the positive reaction implies that managers and investors perceive the stock split as a good news event regarding their company. This result is consistent with the liquidity hypothesis, which states that the split takes place in order to stabilize the price in a more attractive trading range. This optimal trading range is the result of the dispute between small and wealthy investors. In other words, small investors want a lower share price and wealthy investors want more shares in order to minimize the odd-lot brokerage costs.

After the split, the number of shares will increase, while the total capital will remain unaffected, but the price of the stock will decrease according to the split factor. At this lower price the number of the small investors will probably increase, since now more can afford to buy the specific stock, the number of wealthy investors will either remain comparatively stable or increase also, driving the stock's liquidity (marketability) upwards (Brooks, Patel and Su, 2003).

1.1.4 Nairobi Securities Exchange

Nairobi Securities Exchange (NSE) is a market which was started in 1954 and licensed by the capital market authority (NSE, 2014). Its main function is to regulate the security market and bringing together borrowers and investors. Stock splits leads to a lower proportion of institutional ownership, and a higher proportion of individual ownership, after the split than before the split. This attracts most investors.

In Kenya stock splits is used primarily by firms that have seen their share prices increase substantially and although the number of outstanding shares increases and price per share decreases, the market does not change. As a result, stock splits help make shares more affordable to small investors and provide greater marketability and liquidity in the market (Bwihili, 2013).

Firms in the Nairobi Securities Exchange split their stock to lower the price making the stock more attractive to smaller investors. This leads to liquidity increases. In other words, if an investor wants to get out of an investment, shares can be more easily traded for cash. The reason why firms split their stocks is because investors like to see stock splits because it creates a positive image of the company. The market perceives businesses that engage in splits as a growing entity. Aduda (2010) found out that the Kenyan market reacts positively to stock splits, as shown by a general increase in volumes of shares traded around the stock split. There is also an increase in trading activity after the stock split as compared to that before the stock split.

1.2 Research Problem

According to Fama (2002) by announcing splits, a firm could mitigate any information asymmetries that might exist between stock holders and the management. The stock price reduction as a result of a split conveys the management's conviction of rising future earnings this because a stock split usually requires a significant cash outlay, and because sending a false signal would punish the company with an usually low stock price, a stock split is often seen as a more credible form of information diffusion than press releases.

Stock splits are relatively new events in Kenya; for instance, the first stock split recorded in the NSE was in 1994. This was followed by eight other splits by the year 2008. NSE has reported cases of prices overacting to new information and remaining unstable for many days. This has resulted to doubts on a market's ability to efficiently reflect relevant information. Examples include: Crown Berger's share price fell from KES 38 to KES 8 in August 2008 and later settled at KES 26.00 after its interim results (Nyamosi, 2011).

Studies have been done globally and locally on stock splits for instance; Muscarella and Vetsuypens (1996) investigated the stock split and liquidity of listed firms. The results of the analysis found that stock splits increased in post-split beta.Wulff (2002) carried out a research on market reaction to stock split in the German market and found excess returns during the first four days following the split announcement.

Dennis (2003) did a study to examine the effect of stock splits on shares prices. The results revealed that stock splits led to an increase in shares prices.

Waithanje (2013) examined the long-run effect of stock split announcements on market performance of companies listed at the Nairobi Securities Exchange. The results showed that stock split was positively related to market performance of firms. Bwihili (2013) examined the effect of stock splits on returns of listed companies at the Nairobi Securities Exchange. The study found out that the Kenyan market reacts positively to stock splits. Gachuhi (2013) studied the effect of stock splits on return volatility of firms listed at the Nairobi Securities Exchange. The study found that seven out of the twelve splitting stocks exhibited an increase in post-split beta.

Most studies that have examined the effect of stock splits have investigated this variable in relation to market performance and stock volatility for example Waithanje (2013) and Gachuhi (2013). Only one study was done by Bwihili (2013), who examined the effect of stock splits on returns of listed companies at the Nairobi Securities Exchange. The studies done in the Kenyan market are quite few to give a conclusive result. It is therefore not possible to generalize this kind of market reaction elicited by stock split into the Kenyan market. This necessitated the need to further investigate the effect of stock splits on stock returns of firms listed at the Nairobi Securities Exchange to realize conclusive results by attempting to answer the question: what is the effect of effect of stock splits on stock returns of firms listed at the Nairobi Securities Exchange?

1.3 Research Objective

To determine the effect of stock splits on stock returns of firms listed at the Nairobi Securities Exchange.

1.4 Value of the Study

The study will serve as a resource to the investors. They will be able to make more informed decisions since they will be informed about the approximate returns expected. They will be able to invest their money wisely in investments that promise higher returns.

The empirical findings of this study might be used by the policy makers for example Capital Markets Authority (CMA) in setting up polices that promote firms to split their stocks to realize high share prices. Corporate managers and analyst concerned about stock splits announcements will decipher the underlying signal of this decision and determine the implications of valuations by the splitting firm and other firms in the industry.

The study will educate academicians and researchers. It will add to the existing body of knowledge. Researchers will expound their knowledge on the theories related to stock splits and share prices and how this impacts on the investment decisions made by the investors.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section provides a critical review of theories, the determinants of share prices, empirical review and the summary of the literature review.

2.2 Theoretical Review

This section covers the theories that support the relationship that exists between stock splits and share prices of listed firms. The theories are namely: signaling theory, Pecking order Theory and

2.2.1 Signaling Theory

Noting the inconsistency between trade-off theory and the observed pecking order of financing, Myers and Majluf (1984) proposed a new theory, called signaling, or asymmetric information theory of capital structure. They demonstrated that with asymmetric information, equity issues are rationally interpreted on average as bad news, since managers are motivated to make issues when the stock is overpriced.

Ross's (1977) suggest that the value of firms will rise with leverage, since increasing leverage increases the market's perception of value. Asquith and Mullins (1983) empirically observed that announcements of new equity issues are greeted by sharp declines in stock prices. This is a major reason why equity issues are comparatively rare among large established corporations. Debt also plays an important role in allowing investors to generate information useful for monitoring management and implementing efficient operating decisions (Fama and French, 2002).

McNichols and Dravid (2001), and Brennan and Hughes (1991), interpreted the positive stock market reaction to split announcements as a response to managers signaling favorable inside information. Signaling explanations are consistent with abnormal increases in earnings and dividends around the split. When a manager believes that the future share price will decrease, he may not be willing to split the stock due to the increased cost of trading a lower priced stock, or due to their reluctance to split the stock and then have the share price fallen below the manager's perceived optimal trading range. While managers may not explicitly intend for the split to be a positive signal about the future prospects of the firm, the split conveys information to the market. Institutional owners may be better able to take advantage of this signal, compared to individual owners, either because they trade much more than individuals, and are not as wealth constrained, or because they are more efficient at interpreting and processing the signal.

2.2.2 Liquidity Hypothesis

According to the liquidity hypothesis, firm managers may split their firm's stock to improve its liquidity that is the fundamental reason why mangers split their firms stocks (Baker and Gallagher, 1980). Muscarella and Vetsuypens (1996) examined splits of American Depository Receipts (ADRs) that are not accompanied by splits on their corresponding domestic shares. The results revealed that ADR solo-splits are motivated by a desire to enhance the ADR's liquidity in the USA. On the other hand, Conroy et al. (1990) and Schultz (2000) found that there was an increase in effective bid-ask spread as a result of stock splits.

The most common rationale behind stock splits according to the liquidity hypothesis is that there is an optimal price range for securities. The stocks that trade in this range are presumed to be more liquid since they have lower brokerage fees as a per cent of value traded. This optimal range is considered to be a compromise between the desires of wealthy investors and institutions that will minimize brokerage costs if securities are highly-priced, and the desires of small investors who will minimize odd-lot brokerage costs if securities are low-priced.

The optimal trading range hypothesis is in contrast to the decrease in trading activity after a stock split that was observed by Copeland (1979) and Conroy et al. (1990). Also, Muscarella and Vetsuypens (1996) showed that liquidity after a stock split improves which is accompanied by wealth gains for the investors. Their findings support the model of Amihud and Mendelson (1986) that predicts a positive relationship between equity value and liquidity. According to this model, rational investors discount illiquid securities heavier than liquid ones due to the higher transaction costs and the greater trading frictions they face.

2.2.3 Pecking Order Theory

This theory was propounded by Donaldson (1961) followed by Myers (1984) who suggested that management follows a preference ordering during financing. Costs of issuing risky debt or equity overwhelm the forces that determine optimal leverage in the trade-off model; the result is the pecking order. He also argued that the trade-off theory fails to predict the wide degree of cross-sectional and time variation of observed debt ratios.

The pecking order theory is mainly a behavioral explanation of why certain companies finance the way they do. It is consistent with some rationale arguments, such as asymmetric information and signaling, as well as with flotation costs. Moreover, it is consistent with the observation that the most profitable companies within an industry tend to have the least amount of leverage. This pecking order theory suits large firms with high profitability and which has enough internal funds in the form of retained earnings and depreciation. These firms follow a stringent dividend policy and a target dividend payout ratio. Thus, this theory states that highly profitable firms prefer internal funds and when external funds are required the firm will borrow, rather than issuing equity. The pecking order theory predicts that high-growth firms, typically with large financing needs, will end up with high debt ratios because of a manager’s reluctance to issue equity (Smith and Watts, 1992).

Smith and Watts (1992) and Fama and French (2002) also suggested that high-growth firms consistently use less debt in their capital structure. Firms that choose to fund with equity today will leave less expensive sources of funding for future needs. If they choose debt funding now, then they will tend to have more expensive funding available in the future. This reasoning made Cornell and Shapiro (1997) to hypothesize that, firms with higher levels of net organizational capital; should be predominantly equity financed and hold relatively large cash balances. Corporate managers are more likely to follow a financing hierarchy than to maintain a target debt- equity ratio.

2.3 Determinants of Share Prices

There are various determinants of share prices; these include: Initial public offerings, supply and demand, economic activities, natural disaster and government policy.

When a firm’s shares first go on sale on the stock market in an initial public offering (IPO), they can attract a high interest that lifts its share price in the short term. If the listing attracts a lot of attention, the price at which the company's shares are first offered can move higher before the listing. The shares can also then spike higher in the short-term immediately following the IPO. In the long-term, however, this can have a negative impact on the firm's share price as traders try to take advantage of the short-term hype to sell stock at a much higher price than the firm's true value. This can ultimately push down its share price (McNichols and Dravid, 2001).

The share price of a company is effectively the limit of what an investor is prepared to pay for it. If investors are confident that the stock of a company is undervalued demand will increase and the price will increase until those investors who own the stock feel the price is worth selling for. At this point supply and demand will balance out and the price will stabilize until something happens to convince investors to increase demand again. The reverse of this is where supply is greater than demand and those wishing to sell have to lower their price until demand increases (Chen and Kim, 2011).

Economic activities can have an effect on the share price of a company even when it is not directly affected. In a recession when people have less money to spend and are concerned about the risks of investing in the markets the demand for the stock of a company can be reduced which will push the price down (Boehme, 2001). Natural disasters can also cause drops in share prices as concerns over likely price increases in commodity and raw materials. Government policy and perceived policy changes including upcoming elections can also affect prices where conditions for business are likely to change. For example the Kenyan securities market experienced a significant decline in trading following the post-election violence of 2007/ 2008.

2.4 Empirical Review

The section discusses the relationship between stock splits and share prices of listed firms. It consists of both local and global studies that have tested the relationship between stock prices and share prices and their findings:

2.4.1 International Evidence

Dennis (2003) did a study to examine the effect of stock splits on shares prices. The study did a cross-sectional survey in March 2000 two-for-one split of the Nasdaq-100 Index Tracking Stock. The study used secondary data that was obtained from financial statements from the sampled firms in Nasdaq. Daily average abnormal returns were then calculated for the event for a period of two months. The results revealed that stock splits impacted on shares prices.

Minley (2005) did a study on the stock split and liquidity of listed firms in London stock exchange. The study adopted an events study to test whether there was any relationship between stock split and liquidity. Stock returns were calculated in a period of 30 days pre-split and another 30 days post-split. The results of the analysis found that stock splits increased in post-split beta.

Bildley (2009) investigated the effect of Stock splits on share prices in the Canadian Market. The study observed the Canadian market between 2004 to 2015 and the findings revealed that abnormal return was detected only in the first year and this subsided afterwards. The results revealed that stock splits were positively related to share prices.

Potreus (2010) surveyed the relationship between stock splits and liquidity of listed firms in Scotland. The study used an events study in examining the listed firms. The data was specifically for the event window of 30 days before the stock split date and another30 days after the stock split date. The study concluded that stock splits led to increased demand for securities which resulted to an increase in share prices.

Copeland (2014) carried out a research on market reaction to stock split in the American market and found excess returns during the first four days following the split announcement. These studies suggested that splits were mainly aimed at restoring stock prices to a normal range. Some support was also found for signaling motive of stock splits.

2.4.2 Local Evidence

Simbovo (2006) studied the effect of stock splits and large stock Dividend on liquidity: evidence from the Nairobi stock exchange. The study used a descriptive research design study, aimed at establishing the effect of stock splits and stock distribution on the liquidity of a share. The sample was drawn from a population of 48 companies listed at the Nairobi Stock exchange. The individual companies were sampled through cluster sampling technique due to qualities each company in the sample had, they had either had a stock split or declared a bonus issue of25% and above. Data from secondary sources was used to compute the measure of Liquidity, which was proxy, by Trading Activity ratio. The data collected from the Nairobi Stock exchange, was edited, coded, transformed and entered into various data analysis tools ready for analyses by use of excel and SPSS computer packages. Data was analyzed and presented in form of frequency tables, and charts. The study found out that in the case of splits, most managers in Kenya opt for stock splits to 40 maintain an optimal trading range.

Aduda and Chemarum (2010) studied the effect of stock splits on share prices of firms listed at the Nairobi Securities Exchange. The study used an event study; the study used calculated returns to determine whether stock splits elicit any reaction in the Kenyan market. The study made use of daily prices for sample stock for the event window of 60 days, consisting of 30 days before and 30 days after the stock split. The study found out that the Kenyan market reacts positively to stock splits, as shown by a general increase in volumes of shares traded around the stock split. There is also an increase in trading activity after the stock split as compared to that before the stock split.

Waithanje (2013) examined the long-run effect of stock split announcements on market performance of companies listed at the Nairobi Securities Exchange. This was achieved by studying thirteen companies that had undergone stock splits in the period 2004 to 2012. The study made use of daily adjusted prices for sample stock for the period of 102 months. The calendar-time portfolio methodology was employed in the determination of the effects of the split. Portfolio returns were calculated each month and regressed using the Fama and French (1993) three factor model to determine the level of abnormal returns. The study found that the performance was significantly positively correlated with the market factor.

Bwihili (2013) examined the effect of stock splits at the Nairobi Securities Exchange. This was achieved by studying eight companies that had undergone stock splits in the period 2000 to 2010. The study made use of the calculated returns to determine whether stock splits elicit any reaction in the Kenyan market. The study made use of daily prices for sample stock for the event window of 60 days, consisting of 30 days before and 30 days after the stock split. The event study methodology was employed in the determination of the effects of the split. A cross-sectional regression analysis was carried out using SPSS analysis program to determine the coefficients of the model. Returns of the eight selected companies were calculated and plotted on graphs against the days around the stock split. Daily average abnormal returns were then calculated for the event window of 60 days. The graphs were then analyzed to check for increased returns on days around the stock split. The abnormal returns were also plotted against the event window of 60days. The study found out that the Kenyan market reacts positively to stock splits, as shown by a general increase in returns around the stock split date.

Gachuhi (2013) studied the effect of stock splits on return volatility of firms listed at the Nairobi Securities Exchange. An event study methodology was used for the splitting stocks at the Nairobi Securities Exchange over the period 2004-2012. A census was conducted on the twelve stock splits executed over the period. Volatility was measured using the standard deviation of return and the beta coefficient used as a measure of systematic risk. Stock returns were calculated over a 150 day's rolling period with 75 days pre-split and 75 days post-split. A graphical observation of the daily standard deviation for an equally weighed portfolio of pre and post-split returns standard indicated a temporary increase in standard deviation that faded away shortly. When the returns were tested for increase in the beta coefficient it was found that seven out of the twelve splitting stocks exhibited an increase in post-split beta.

Onyango (2014) investigated the relationship between stock splits and liquidity of companies listed at the Nairobi securities exchange. A census study was done, drawing from thirteen companies listed in the Nairobi Stock Exchange and which had undergone a stock split in the period 2004 to 2012. The data used was secondary data which was obtained from the Nairobi Securities Exchange. The study made use of stock prices and trading volume data for the event window of 61 days, consisting of 30 days before the stock split date and 30 days after the stock split date. The study found out that generally stock split resulted in a decrease of liquidity in the NSE as opposed to the liquidity and trading range hypotheses. Liquidity of stock was found to be generally higher in the days before the stock split than in the days after the stock split. The aggregate liquidity for the month before the stock split was found to be higher than the month after the stock split.

2.5 Summary of the Literature Review

The above review of empirical studies show stock splits leads to an increase in share prices this is captured by the empirical findings of both local and international studies that have made similar conclusions. This is also in harmony with the theories that support this study. However, theories around the split depend on the conditions and the strategic objective that each company has this is because each stock split gives different signals from the managers to the investors. It is worth noting that irrespective of the firm's conditions and purposes there is a positive market reaction to the announcement of a split.

Among the empirical findings that confirm a positive relationship between stocks splits and increase in share prices are; Wulff (2002) and Gachuhi (2013). This supports the hypothesis of the study which predicts a positive relationship between stock splits and share prices. The above studies have dwelt on; long-run effect of stock split announcements, return volatility of firms, market reaction and liquidity. This call for the need to bridge this gap by attempting to investigate the effect of stock splits on shares prices of firms listed at Nairobi Securities Exchange.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the research methodology that was used to achieve the objective of the study. It consists of the research design, population of the study, data collection and data analysis.

3.2 Research Design

The study used an event study research design. This method is appropriate because it enabled comparison of the stock market reaction to an event by making an observation on performance before or after the event. Nagm and Kautz (2007) explains that an event study involves defining the event and estimating whether the stock price changes beyond normal or expected changes in response to the announcement of the stock-split.

3.3 Study Population

The population for this study included all the listed firms at the Nairobi Securities Exchange. Cooper and Shindler (2005) indicate that the target population as the complete set of objects in a given population. The study population consists of sixty four (64) companies listed at the NSE as at June 2014 (Appendix 1). This study focused on 14 firms that have spilt their stocks between the years 2004 and 2014 (See Appendix II). The split firms were selected using systematic random sampling according to their year of split starting from 2004-to-2014.

3.4 Data Collection

The stock prices of the firms were collected from the Nairobi Securities Exchange. The event window consisted of 61 days. Every stock return from the companies were compared with each stock index in order to find which index explained the best returns of the certain company and then, the best explaining index was used for each stock. The historical prices for both the firms and stock indexes were collected from day-30 to day +30, being the event period. The estimation period was from day -30 to +30. Second, daily returns were calculated for all the firms as well as for indexes on the event period. Daily returns were calculated for all the firms and the indexes on the event period.

Daily returns were obtained using the following formula:

$$DRt=Pt- Pt-1/Pt-1$$

Where;

DRt=Daily returns at time t

Pt=Adjusted closing price at time t

Pt-1=Adjusted closing price one day before time t

The study made use of the published financial statements of listed firms in the period under investigation to establish splits that occurred and the split dates. Additional information was obtained from other secondary sources for example NSE share price index, the firms' websites and Capital Markets Authority (CMA).

3.5 Data Analysis

The event study statistical technique was applied to analyze the data obtained from the firms. According to Mackinlay (2002) an event study measures the influence of a specific event on the firm's value by the use of financial market data. After selection of the firms, a prediction of a normal return during the event window in the absence of the event was done. Later, an estimation of abnormal return within the event window was conducted. This is the difference between actual returns and expected returns. Cumulative abnormal return was calculated.

3.5.1 Analytical Model

After calculating the daily returns for each firm as well as for the indexes, normal returns were calculated. Normal returns are simply the estimates of the stock returns in absence of the event. Normal returns can be estimated by several different methods, including mean return model, market model and capital asset pricing model. However, the most widely used method in the event studies is the single index market model, which estimates the normal return parameters by regressing the firm return in the sample stock against the stock index over an estimation period (from day +30 to -30). The Ordinary Least Squares (OLS) method is commonly used to estimate the parameters.

Step I Normal Returns

$NR_{it} = R_{it} – DR_t$

Where:

NR_{it} = Normal /expected return of security i at time t

R_{it} = Actual return on security i on day t

DR_t = Daily returns at time t

Actual and daily returns on security i in period t were computed as follows;-

Actual return = NASI/NSE 20-Share Index

Daily return = Pt- Pt-1/Pt-1

Or Pt- Pt-1+Dt/Pt-1

Where:

NASI = Number of issued shares multiplied by closing price of day t.

NSE 20-Share Index = number of issued shares for benchmark companies by NSE multiplied by closing price of day t.

Pt = Adjusted closing price at time t

Pt-1 = Adjusted closing price one day before time t

Dt = Divided distributed

The study adopted a pre-event period to find out the normal return of the share.

Step II Abnormal Returns

For the purpose of studying the effect of stock splits on share prices abnormal returns were computed. Abnormal returns were obtained by finding the difference between actual returns of the security i on day t and expected /normal returns of security i on day t. The following is the formula for ordinary least squares market model to compute abnormal returns:-

ARit = Rit – ERit

Where;

ARit = Abnormal return of security i on day t

Rit = Actual return on security i on day t

ERit = Expected/normal return on security i on day

Actual and expected returns on security i in period t were computed as follows;-

Actual return = NASI/NSE 20 - Share Index

Expected/normal return = Actual return - Daily return

Step III Cumulative Abnormal Returns

After computation of abnormal returns of all the securities, the Cumulative abnormal returns (CARs) were computed during event period (-30 to +30). Cumulative abnormal return was analyzed to investigate whether the event had an impact on the share prices and how fast this information was absorbed in the share prices. Event timeline was adopted.

CARs were computed as follows:

$$CAR_t = \sum_{i=1}^{N} ARit$$

Where;

CARt = Cumulative Abnormal Return at time t

ARit = Abnormal return of security i on day t

N = Number of days in the event period

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

This chapter discusses data analysis obtained from the field and its interpretation to realize the research objective for this study. The chapter consists of the results and findings on the effect of stock splits on stock return for firms listed at the Nairobi Securities Exchange. Secondary data was collected from Nairobi securities exchange on 7 (seven) firms. The computations of abnormal returns and cumulative abnormal returns have been done as per the split-up companies and cumulative average has been done for all the seven firms.

4.2 Response Rate

The study sampled seven (7) firms out of 14 firms that had split their stocks in the study period (2004-2014). This represents a response rate of 50 % which was considered reliable for making generalizations of the whole population. This response rate tallies with that of Agara (2013) who concluded that a response rate of 58% was a sufficient representation of the whole population.

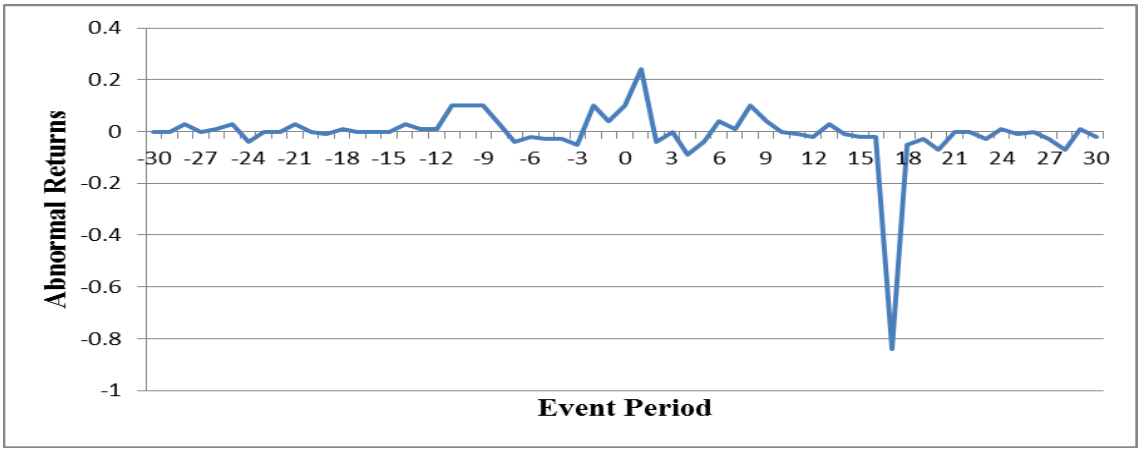
4.3 Findings

The objective of the event study was to find out the effect of stock-splits on stock returns. The study examined the cross-sectional distribution of the stock returns from the actual return in the event window. The abnormal returns were cumulated to establish any effect on securities returns. The findings revealed that the pre-event abnormal returns were partially anticipated and post-event abnormal returns indicated that the information took little time to reflect in the stock returns. The cumulative abnormal returns established that the information impacted positively on securities returns.

4.3.1 Barclays Bank of Kenya

The study sought to determine the effect of stock-splits on stock returns of Barclays bank of Kenya. The results are presented in the figure 4.1 below as follows:

Figure 4.1 Barclays Bank of Kenya



Source: Research Findings

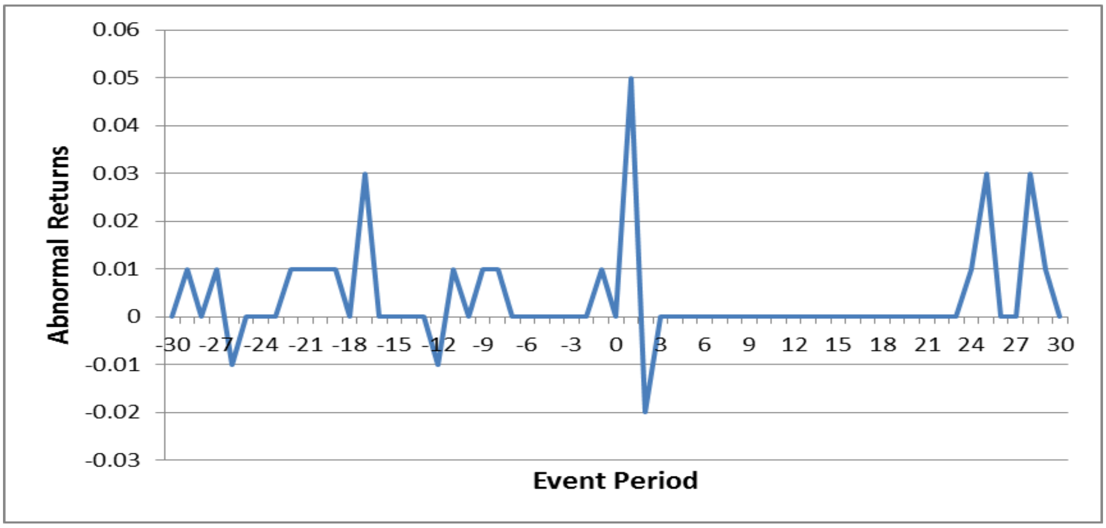
From the above figure 4.1, the results indicated that zero returns were for 9 days and the remaining 21 days showed non-zero returns. On average, it took the first 2 days for the effect on price to be observed within the 30-day post-event period. The effect on share price was sustained for 46 days in the 61-day event period. Pre-event returns gave a positive outlook with a total of 0.34 compared to the total of -0.83 of the post-vent period. The total average abnormal returns during the whole event period were -0.47.AR was found to be negative. This is an indication that stock prices on an average react negatively to stock splits of Barclays bank of Kenya (See table A).

The CAR however increased towards split date and showed continued increase after split for about 10 days but with a very small margin. The total Cumulative average returns for the event period were 10.42. This is an indication that despite AR being negative on average, stock prices reacted positively to stock splits of Barclays bank of Kenya (See table A).

4.3.2 East Africa Breweries Limited (EABL)

The study sought to determine the effect of stock-splits on stock returns of EABL. The results are presented in the figure 4.2 below:

Figure 4.2 EABL



Source: Research Findings

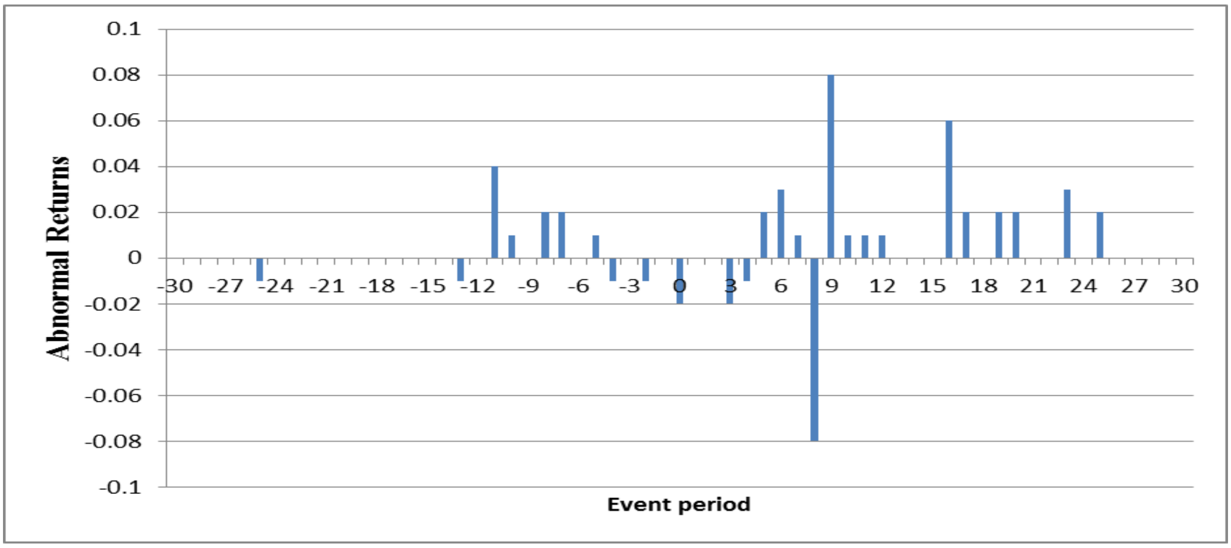
From the figure 4.2 above, the study found that zero and non-zero returns before the event period. On average, it took the first 1 day for the effect on stock return to be felt within the 30-day pre-event period. The effect on share price was sustained over the next 22 days. Zero average returns were remarkably sustained from day 3 to day 23. The findings further observed that the pre-event returns were 0.12 and post-event returns were 0.10 respectively. The average total returns for EABL during the event period were 0.22. This is an indication that stock prices on an average reacted positively to stock splits of East African Breweries Limited (See Table B).

The CAR increased both before and after pre event. The total CAR for the event period was 6.49. This implies that stock prices on an average reacted positively to stock splits of KenolKobil Limited ((See Table C).

4.3.3 KenolKobil Limited

The study sought to determine the effect of stock-splits on stock returns of KenolKobil. The results are presented in the figure 4.3 below:

Figure 4.3 KenolKobil Limited



Source: Research Findings

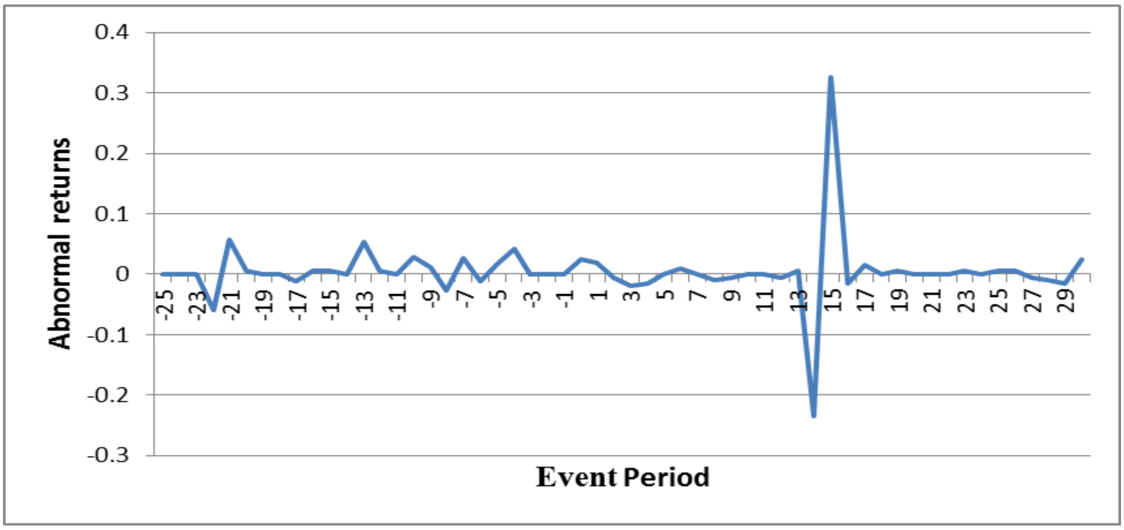
From the figure 4.3 above, the findings observed that on average, it took 3 days for the share prices to react after the stock split within the 30-day pre-event period. This effect was sustained for an estimated 25 days in the event window. Pre-event returns showed a positive reaction with a total of 0.04 and the post-event returns were 0.21 in the post-event period. The total average abnormal returns during the entire event period (61-days) were .025. The reaction of stock prices for this firm was predictable in establishing the relationship between stock splits and stock returns this is because the returns were evenly spread in the event period. This implies that stock prices on an average reacted positively to stock splits of KenolKobil Limited ((See Table C).

The CAR was positive for 12 days before split and then showed a positive increase up to end of event period. The total cumulative abnormal return during the whole event period was 4.89. This is another indication that stock prices on an average reacted positively to stock splits of KenolKobil Limited ((See Table C).

4.3.4 Athi-River Mining Cement Limited

The study sought to determine the effect of stock-splits on stock returns of Athi-river mining Cement Limited. The results are presented in the figure 4.4 below:

Figure 4.4 Athi-River Mining Cement Limited



Source: Research Findings

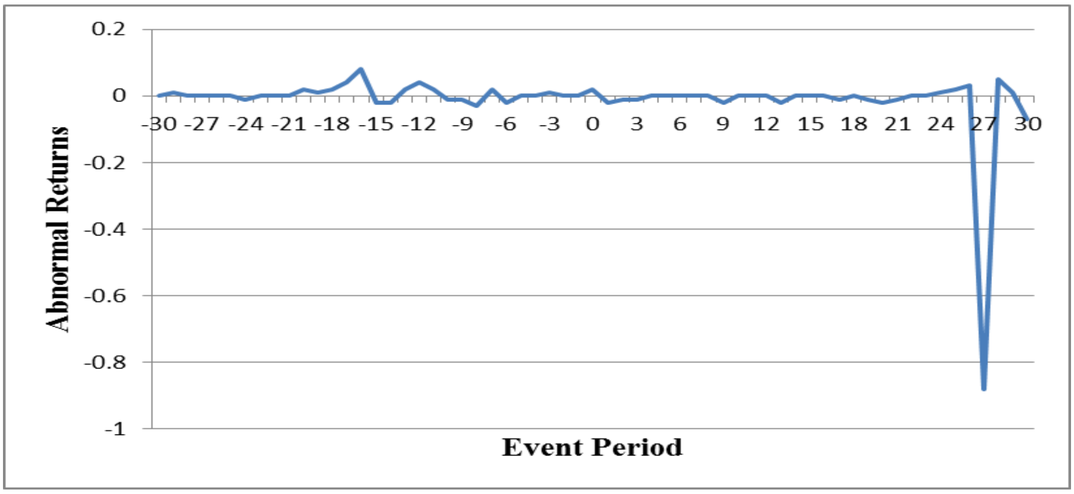
From the above figure 4.4, it was revealed that there were zero and non-zero returns in the pre-event period. The findings revealed that it took one day for the stock prices to react after the stock split within the 30-day post-event period. This effect was sustained for a period of 43 days in an event period of 61 days. Pre-event returns scored an average of 0.15 while the post-event returns had an average of 0.11. The total average abnormal during the whole event period was 0.26. These findings are an indication that stock prices on an average reacted positively to stock splits of Athi-River Mining Cement Limited (See Table D).

The CAR increased throughout the event period to a total of 11.92.The increase was gradual and no decrease was observed during entire event period. This further confirms that stock split announcements led to increase in stock prices of Athi River Mining Cement Limited (See Table D).

4.3.5 Kenya Power

The study sought to determine the effect of stock-splits on stock returns of Kenya Power. The results are presented in the figure 4.5 below:

Figure 4.5 Kenya Power



Source: Research Findings

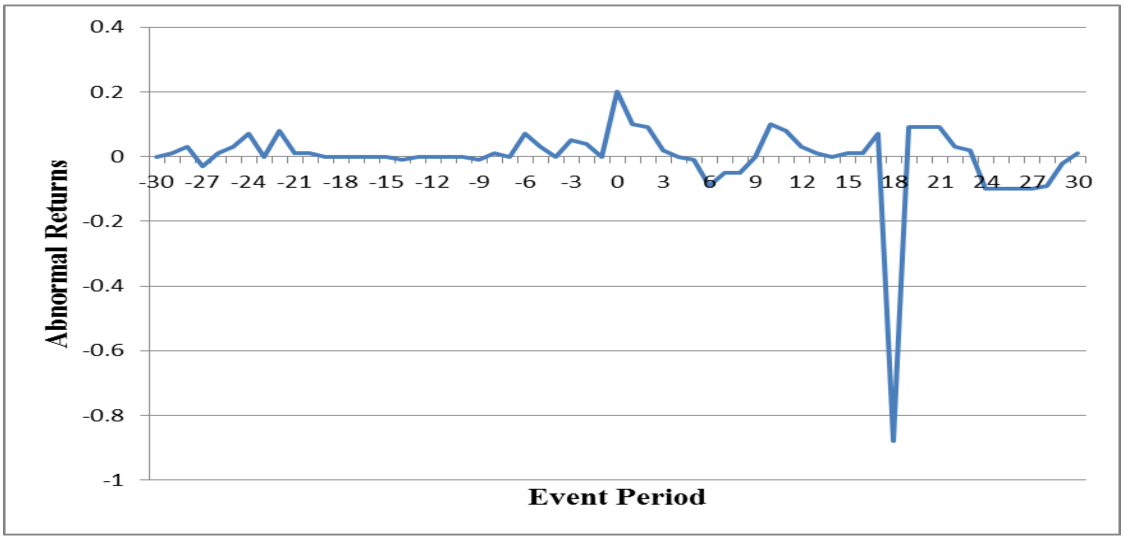
The findings observed both zero and non-zero pre-event returns. It was further revealed that zero returns accounted for 26 days for both pre and post event periods. However, the remaining days sustained non-zero returns. On average, it took the first 1 day to observe the effect of stock splits on share prices in a period of 30-day post-event period. On average the window returns were found to be 0.17 whereas the post-event returns totaled to -.094. The total abnormal return for the entire event period which was 61-days was found to be -0.78. This is an indication that the stock prices on average reacted negatively to stock splits of Kenya power (See Table E).

The CAR however increased towards split date and showed continued increase even after split day but with a very small margin. The total Cumulative average returns for the event period were 3.72. This is an indication that the stock prices on average reacted positively to stock splits of Kenya power (See Table E). In conclusion stock prices reacted positively to stock splits of Kenya power.

4.3.6 East African Cables Limited

The study sought to determine the effect of stock-splits on stock returns of East African Cables Limited. The results are presented in the figure 4.6 below:

Figure 4.6 East African Cables Limited



Source: Research Findings

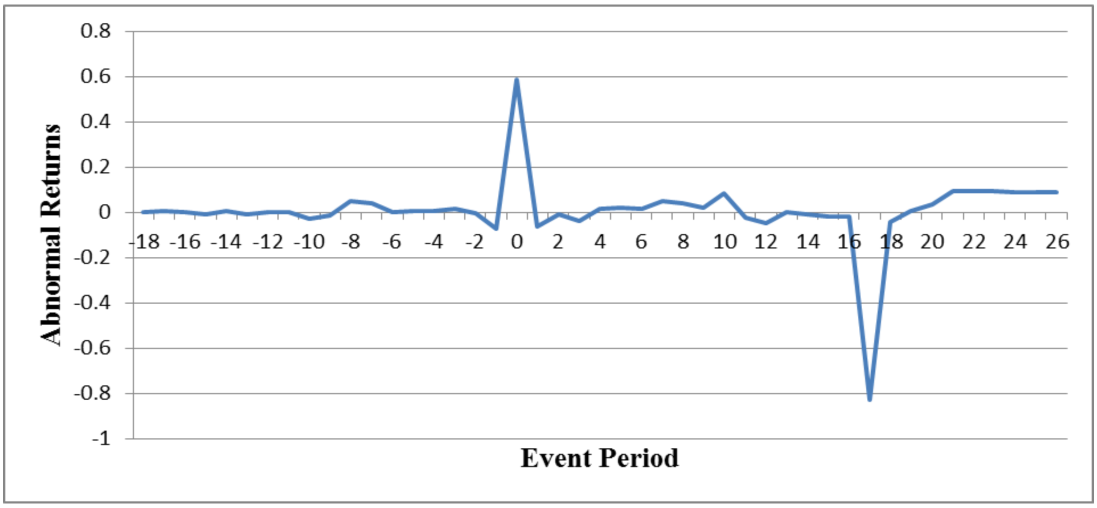
From the above results, East African Cables showed zero returns for 14 days out of 30 days pre-event window period but on average, the pre-event window returns was 0.4. On the other hand, the post-event window period was -0.54. The total abnormal returns for the entire window period (60 days) were found to be -0.13. This implies that stock prices on average reacted negatively to stock splits of East African Cables Limited. On average, it took the first 2 days for the effect on price to be observed within the 30-day post-event period (See Table F).

The CAR increased tremendously throughout the event period to a total of 20.94.The increase was gradual and no decrease was observed during entire event period. This confirms that stock split announcements led to increase in stock prices of East African Cables (See Table F).

4.3.7 Carbacid Investments Limited

The study sought to determine the effect of stock-splits on stock returns of Carbacid Investments Limited. The results are presented in the figure 4.7 below:

Figure 4.7 Carbacid Investments Limited



Source: Research findings

From the above results in figure 4.7, Carbacid investments limited showed that zero returns for 5 days out of the 18 pre-event window period but on average, the pre-event window returns was -0.0015. On the other hand, the post-event window period was 0.32. This implies that the stock prices on an average react positively to stock splits. The total abnormal returns for the entire window period (60 days) were found to be

0.31. On average, it took the first 1days for the effect on price to be observed within the 30-day post-event period (See Table G).

The CAR showed mixed reactions during entire event period with both positive and negative cumulative abnormal returns. However the total CAR for the event period was 9.84. This is an indication that the stock prices on average reacted positively to stock splits of Carbacid investments limited (See Table G).

4.4 Interpretation of the Findings

Out of the seven (7) companies that were studied only three (3) reacted negatively on the effect of stock-splits. The companies are as follows: Barclays bank of Kenya, Kenya Power and East African Cables. Their average abnormal returns in the entire event window period (61-days) were as follows: -0.47, -0.78 and -0.13 respectively. This was an indication that share prices reacted negatively to stock splits of these companies. These findings are consistent to a study by Gachuhi (2013) studied the effect of stock splits on return volatility of firms listed at the Nairobi Securities Exchange. The study concluded that out of the 12 splitting firms only 5 firms exhibited a decrease in post-split beta. These findings however contradict with a number of findings by Waithanje (2013), Bwihili (2013) and Onyango (2014) who investigated the effect of stock-splits on share prices and concluded that the Kenyan market reacts positively to stock splits, as shown by a general increase in returns around the stock split date.

Further, the findings revealed that that out of the seven firms that were studied four reacted positively after stock splits these firms included East Africa Breweries Limited (EABL), KenolKobil Limited, Athi-River Mining Cement Limited and Carbacid Investments Limited. Their average abnormal returns in the entire event window period (61-days) were as follows: 0.22, .025, 0.26 and 0.31 respectively. This implied that most splitting firms react positively to stock splits. These findings are consistent with a study by Aduda and Chemarum (2010) who concluded that there was an increase in trading activity after the stock split as compared before the stock split.

The CAR for all firms were positive despite the fact that some firms had negative total Abnormal returns during the event period. These firms include Barclays bank of Kenya, Kenya Power and East African Cables. Their cumulative abnormal returns in the entire event window period (61-days) were as follows10.42, 3.72 and 20.94 respectively. The findings observed that stock split led to increase in stock returns.. These findings are consistent with a study by Potreus (2010), he concluded that stock splits led to increased demand for securities which resulted to an increase in share prices.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter gives a summary of the analysis and discussions in line with the objective for this study which was to determine the effect of stock-splits on stock returns of listed firms at the Nairobi securities exchange. This chapter consists of the summary of findings, conclusion, recommendations, limitations and areas for further study.

5.2 Summary

Out of the fourteen (14) firms that were targeted the researcher managed to collect data from seven firms that had split their stocks in the study period (2004-2014). This represents a response rate of 50% which was considered sufficient for making generalizations of the whole population.

The study found that stock splits lead to an increase in stock prices this is mainly sustained for an average period of 30 days in the event period. The findings also revealed that stock split announcement were relayed in the stock prices on an average period of one day.

The findings observed that out of the seven (7) companies that had split their stocks in the period 2004 and 2014 only three (3) reacted negatively on the effect of stock-splits. The companies are as follows: Barclays bank of Kenya, Kenya Power and East African Cables. Their abnormal returns in the entire event window period (61-days) were as follows: -0.47, -0.78 and -0.13 respectively. These findings contradicted with the hypothesis for this study which predicted a positive relationship between stock-splits and share prices of splitting firms listed at the Nairobi Securities Exchange.

The findings revealed that that out of the seven firms that had split their stocks four (4) reacted positively after stock splits these firms included East Africa Breweries Limited (EABL), KenolKobil Limited, Athi-River Mining Cement Limited and Carbacid Investments Limited. Their abnormal returns in the entire event window period (61-days) were as follows: 0.22, .025, 0.26 and 0.31 respectively.

The CAR for all firms was positive. These findings are consistent with the theoretical relationship between stock-splits and share prices which is said to be positive.

5.3 Conclusion

The study established that stock-splits impacts positively on stock returns, the findings observed that four companies reacted positively to stock splits in the event period. These companies were as follows: Barclays bank of Kenya, Kenya Power and East African Cables. Further, it was observed that a stock split is reflected in the stock prices almost immediately. On average, it takes 2-days for prices to react to stock splits. The study further established that even firms that had a negative total Abnormal returns turned out to have a positive total cumulative abnormal return in the long run.

Therefore, the study concludes that the security prices react positively to stock splits. This supports the semi- strong form efficient market hypothesis that states that securities prices reflect all public information hence no inside information can place an investor at an advantaged position.

5.4 Recommendations for Policy and Practice

From the study findings, the study recommends that since stock split is a new phenomenon in the Kenyan market, therefore capital markets authority should encourage listed firms to split their stocks to boost their stock returns.

The study also recommends that local and international investors should be educated about trading at NSE in an attempt to encourage long-term investments other than short-term. This will help firms to minimize abnormal reaction of prices caused by speculative trading by retail investors.

The study further recommends that Capital markets authority should ensure that listed firms comply with insider laws and regulations of trading, guidelines, rules and regulations to effectively monitor the stock market. This will enhance investor confidence by minimizing inequities in accessing such information.

5.5 Limitations of the Study

The study encountered the following limitations: The study heavily relied on secondary data for the literature review which was majorly from research conducted in developed countries since we have very few studies carried out at the Nairobi Securities exchange.

The other limitation of this study is that it was not easy for the researcher to access secondary data. The researcher went of her way to find a trader involved in research concerning NSE trading to guide on how to calculate the returns practically. This took a while to internalize these formulas and calculate the parameters.

5.6 Suggestions for Further Research

The current study covered a period of 61 days, 30 days before and 30 days after to investigate the effect of stock splits on stock returns. Future researchers interested in this field of study should consider covering a longer event period to establish whether they will get similar results.

The study assumed that stock split was the only event that took place when the research was conducted. Further research should be conducted to find out whether there are any other confounding variables that might have an effect on the relationship between stock returns and stock splits. The study sampled seven firms that split their stocks in the study period (2004-2014). A census survey is recommended for further empirical investigations into NSE stock splits announcements.

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APPENDICES

APPENDIX I: LIST OF FIRMS LISTED AT NSE

nairobi securities exchange
Discover Opportunity

AGRICULTURAL
Eaagads Ltd
Kakuzi Ltd
Kapchorua Tea Co. Ltd
The Limuru Tea Co. Ltd
Rea Vipingo Plantations Ltd
Sasini Ltd
Williamson Tea Kenya Ltd
AUTOMOBILES & ACCESSORIES
Car & General (K) Ltd
Marshalls (E.A.) Ltd
Sameer Africa Ltd
BANKING
Barclays Bank of Kenya Ltd
CFC Stanbic of Kenya Holdings Ltd
Diamond Trust Bank Kenya Ltd
Equity Bank Ltd
Housing Finance Co.Kenya Ltd
I&M Holdings Ltd
Kenya Commercial Bank Ltd
National Bank of Kenya Ltd
NIC Bank Ltd
Standard Chartered Bank Kenya Ltd
The Co-operative Bank of Kenya Ltd
COMMERCIAL AND SERVICES
Express Kenya Ltd
Hutchings Biemer Ltd
Kenya Airways Ltd
Longhorn Kenya Ltd
Nation Media Group Ltd
Scangroup Ltd
Standard Group Ltd
TPS Eastern Africa Ltd
Uchumi Supermarket Ltd
CONSTRUCTION & ALLIED
ARM Cement Ltd
Bamburi Cement Ltd
Crown Paints Kenya Ltd
E.A.Cables Ltd
E.A.Portland Cement Co. Ltd

ENERGY & PETROLEUM
KenGen Co. Ltd
KenolKobil Ltd
Kenya Power & Lighting Co Ltd
Kenya Power & Lighting Ltd 4% Pref 20.00
Kenya Power & Lighting Ltd 7% Pref 20.00
Total Kenya Ltd
Umeme Ltd
INSURANCE
British-American Investments Co.(Kenya) Ltd
CIC Insurance Group Ltd
Jubilee Holdings Ltd
Kenya Re Insurance Corporation Ltd
Liberty Kenya Holdings Ltd
Pan Africa Insurance Holdings Ltd
INVESTMENT
Centum Investment Co Ltd
Olympia Capital Holdings Ltd
Trans-Century Ltd
INVESTMENT SERVICES
Nairobi Securities Exchange Ltd Ord 4.00
MANUFACTURING & ALLIED
A.Baumann & Co Ltd
B.O.C Kenya Ltd
British American Tobacco Kenya Ltd
Carbacid Investments Ltd
East African Breweries Ltd
Eveready East Africa Ltd
Kenya Orchards Ltd
Mumias Sugar Co. Ltd
Unga Group Ltd
TELECOMMUNICATION & TECHNOLOGY
Safaricom Ltd
GROWTH ENTERPRISE MARKET SEGMENT (GEMS)
Flame Tree Group Holdings Ltd Ord 0.825
Home Afrika Ltd

Source: NSE (2014)

APPENDIX II: LIST OF FIRMS THAT SPLIT STOCKS BETWEEN 2004 AND 2014

	Name of firm	**Date of Split Announcement**
1	Carbacid Investments Ltd	23/10/2013
2	Athi River Mining Cement Ltd	14/05/2012
3	Kenya Power & Lighting Co. Ltd	07/10/2010
4	Equity Bank Ltd	12/02/2009
5	Nation Media Group Ltd	04/08/2008
6	Kenya Commercial Bank Ltd	03/04/2007
7	CMC Holdings Ltd	26/02/2007
8	Sasini Ltd	15/02/2007
9	Barclays Bank of Kenya Ltd	08/11/2006
10	I.C.D.C Investments Co. Ltd	19/10/2006
11	East African Cables Ltd	10/08/2006
12	Centum Investment Co. Ltd	26/08/2004
13	East African Breweries Ltd	26/08/2004
14	Kenol Kobil Ltd	20/05/2004

Source: NSE (2014)

APPENDIX III: SHARE PRICES REACTION TO STOCK SPLITS

NSE 20 SHARE INDEX = 19.66							
BARCLAYS BANK OF KENYA LIMITED							
Observation Day	**Price(KES)**	**NASI**	**NASI Adj (Rit)**	**DR*t***	**NR*it***	**AR*it***	**CARt**
-30	327	4778	243.03	0	243.03	0	0
-29	315	4728	240.49	0	240.49	0	0
-28	324	4781	243.18	0.028571429	243.16	0.03	0.03
-27	324	4829	245.63	0	245.63	0	0.03
-26	327	4881	248.27	0.009259259	248.26	0.01	0.04
-25	338	4879	248.17	0.033639144	248.14	0.03	0.07
-24	326	4843	246.34	-0.035502959	246.37	-0.04	0.03
-23	327	4942	251.37	0.003067485	251.37	0	0.03
-22	327	4937	251.12	0	251.12	0	0.03
-21	338	4946	251.58	0.033639144	251.54	0.03	0.06
-20	338	4903	249.39	0	249.39	0	0.06
-19	335	4889	248.68	-0.00887574	248.69	-0.01	0.05
-18	337	4893	248.88	0.005970149	248.88	0.01	0.06
-17	338	4882	248.32	0.002967359	248.32	0	0.06
-16	339	4906	249.54	0.00295858	249.54	0	0.06
-15	338	4857	247.05	-0.002949853	247.05	0	0.06
-14	348	4851	246.74	0.029585799	246.72	0.03	0.09
-13	352	4875	247.97	0.011494253	247.95	0.01	0.1
-12	354	4864	247.41	0.005681818	247.4	0.01	0.11
-11	389	4910	249.75	0.098870056	249.65	0.1	0.21
-10	427	4963	252.44	0.097686375	252.34	0.1	0.31
-9	469	5061	257.43	0.098360656	257.33	0.1	0.41
-8	484	5106	259.72	0.031982942	259.68	0.03	0.44
-7	466	5177	263.33	-0.037190083	263.36	-0.04	0.4
-6	459	5314	270.3	-0.015021459	270.31	-0.02	0.38
-5	446	5403	274.82	-0.02832244	274.85	-0.03	0.35
-4	432	5529	281.23	-0.031390135	281.26	-0.03	0.32
-3	411	5515	280.52	-0.048611111	280.57	-0.05	0.27
-2	433	5555	282.55	0.053527981	282.5	0.05	0.32
-1	441	5604	285.05	0.018475751	285.03	0.02	0.34
0	484	5638	286.78	0.097505669	286.68	0.1	0.44
1	602	5656	287.69	0.243801653	287.45	0.24	0.68
2	576	5654	287.59	-0.043189369	287.63	-0.04	0.64
3	576	5654	287.59	0	287.59	0	0.64
4	526	5608	285.25	-0.086805556	285.34	-0.09	0.55
5	504	5585	284.08	-0.041825095	284.12	-0.04	0.51
6	524	5603	284.99	0.03968254	284.96	0.04	0.55
7	527	5602	284.94	0.005725191	284.94	0.01	0.56
8	578	5642	286.98	0.096774194	286.88	0.1	0.66

9	599	5676	288.71	0.03633218	288.67	0.04	0.7
10	599	5667	288.25	0	288.25	0	0.7
11	594	5665	288.15	-0.008347245	288.16	-0.01	0.69
12	580	5676	288.71	-0.023569024	288.73	-0.02	0.67
13	599	5752	292.57	0.032758621	292.54	0.03	0.7
14	591	5791	294.56	-0.013355593	294.57	-0.01	0.69
15	580	5762	293.08	-0.018612521	293.1	-0.02	0.67
16	571	5656	287.69	-0.015517241	287.71	-0.02	0.65
17	92	5615	285.61	-0.838879159	286.44	-0.84	-0.19
18	87	5553	282.45	-0.054347826	282.51	-0.05	-0.24
19	84	5490	279.25	-0.034482759	279.28	-0.03	-0.27
20	78.5	5417	275.53	-0.06547619	275.6	-0.07	-0.34
21	78.5	5429	276.14	0	276.14	0	-0.34
22	78.5	5481	278.79	0	278.79	0	-0.34
23	76.5	5477	278.59	-0.025477707	278.61	-0.03	-0.37
24	77	5516	280.57	0.006535948	280.56	0.01	-0.36
25	76.5	5525	281.03	-0.006493506	281.03	-0.01	-0.37
26	76.5	5582	283.93	0	283.93	0	-0.37
27	74.5	5530	281.28	-0.026143791	281.31	-0.03	-0.4
28	69	5624	286.06	-0.073825503	286.14	-0.07	-0.47
29	69.5	5572	283.42	0.007246377	283.41	0.01	-0.46
30	68	5570	283.32	-0.021582734	283.34	-0.02	-0.48
						-0.47	**10.42**

EAST AFRICAN BREWERIES LIMITED

Observation Day	Price(KES)	NASI	NASI Adj (Rit)	DR*t*	NR*it*	AR*it*	CARt
-30	445	2686	136.62	0	136.62	0	0
-29	450	2674	136.01	0.011235955	136	0.01	0.01
-28	450	2670	135.81	0	135.81	0	0.01
-27	454	2636	134.08	0.008888889	134.07	0.01	0.02
-26	449	2657	135.15	-0.011013216	135.16	-0.01	0.01
-25	449	2640	134.28	0	134.28	0	0.01
-24	450	2614	132.96	0.002227171	132.96	0	0.01
-23	450	2635	134.03	0	134.03	0	0.01
-22	454	2636	134.08	0.008888889	134.07	0.01	0.02
-21	459	2658	135.2	0.011013216	135.19	0.01	0.03
-20	462	2671	135.86	0.006535948	135.85	0.01	0.04
-19	467	2708	137.74	0.010822511	137.73	0.01	0.05
-18	466	2697	137.18	-0.002141328	137.18	0	0.05
-17	480	2720	138.35	0.030042918	138.32	0.03	0.08
-16	480	2733	139.01	0	139.01	0	0.08
-15	480	2749	139.83	0	139.83	0	0.08
-14	479	2757	140.23	-0.002083333	140.24	0	0.08
-13	479	2739	139.32	0	139.32	0	0.08
-12	476	2746	139.67	-0.006263048	139.68	-0.01	0.07

-11	483	2735	139.11	0.014705882	139.1	0.01	0.08
-10	485	2730	138.86	0.004140787	138.86	0	0.08
-9	490	2715	138.1	0.010309278	138.09	0.01	0.09
-8	497	2707	137.69	0.014285714	137.68	0.01	0.1
-7	495	2703	137.49	-0.004024145	137.49	0	0.1
-6	494	2724	138.56	-0.002020202	138.56	0	0.1
-5	495	2716	138.15	0.002024291	138.15	0	0.1
-4	494	2700	137.33	-0.002020202	137.34	0	0.1
-3	494	2682	136.42	0	136.42	0	0.1
-2	495	2678	136.22	0.002024291	136.21	0	0.1
-1	500	2688	136.72	0.01010101	136.71	0.01	0.11
0	499	2698	137.23	-0.002	137.23	0	0.11
1	524	2712	137.95	0.0501002	137.89	0.05	0.16
2	511	2711	137.89	-0.02480916	137.92	-0.02	0.14
3	510	2708	137.74	-0.001956947	137.74	0	0.14
4	510	2717	138.2	0	138.2	0	0.14
5	510	2710	137.84	0	137.84	0	0.14
6	510	2710	137.84	0	137.84	0	0.14
7	510	2713	138	0	138	0	0.14
8	511	2699	137.28	0.001960784	137.28	0	0.14
9	510	2711	137.89	-0.001956947	137.9	0	0.14
10	510	2708	137.74	0	137.74	0	0.14
11	510	2700	137.33	0	137.33	0	0.14
12	509	2689	136.78	-0.001960784	136.78	0	0.14
13	510	2671	135.86	0.001964637	135.86	0	0.14
14	510	2652	134.89	0	134.89	0	0.14
15	509	2652	134.89	-0.001960784	134.9	0	0.14
16	510	2652	134.89	0.001964637	134.89	0	0.14
17	510	2645	134.54	0	134.54	0	0.14
18	510	2648	134.69	0	134.69	0	0.14
19	510	2643	134.44	0	134.44	0	0.14
20	510	2641	134.33	0	134.33	0	0.14
21	510	2650	134.79	0	134.79	0	0.14
22	510	2652	134.89	0	134.89	0	0.14
23	510	2642	134.38	0	134.38	0	0.14
24	514	2660	135.3	0.007843137	135.29	0.01	0.15
25	528	2670	135.81	0.027237354	135.78	0.03	0.18
26	530	2670	135.81	0.003787879	135.8	0	0.18
27	530	2648	134.69	0	134.69	0	0.18
28	544	2647	134.64	0.026415094	134.61	0.03	0.21
29	552	2650	134.79	0.014705882	134.78	0.01	0.22
30	552	2664	135.5	0	135.5	0	0.22
						0.22	**6.49**

KENOLKOBIL LIMITED							
Observation Day	Price(KES)	NASI	NASI Adj (Rit)	DR*t*	NR*it*	AR*it*	CARt
-30	331	2664.3	135.52	0	135.52	0	0
-29	331	2600.26	132.26	0	132.26	0	0
-28	331	2576.23	131.04	0	131.04	0	0
-27	331	2581.46	131.31	0	131.31	0	0
-26	331	2595.04	132	0	132	0	0
-25	328	2668.22	135.72	-0.009063444	135.73	-0.01	-0.01
-24	328	2693.88	137.02	0	137.02	0	-0.01
-23	328	2727.73	138.75	0	138.75	0	-0.01
-22	328	2734.68	139.1	0	139.1	0	-0.01
-21	328	2742.33	139.49	0	139.49	0	-0.01
-20	328	2758.22	140.3	0	140.3	0	-0.01
-19	329	2755.23	140.14	0.00304878	140.14	0	-0.01
-18	329	2747.52	139.75	0	139.75	0	-0.01
-17	329	2735.18	139.12	0	139.12	0	-0.01
-16	328	2725.34	138.62	-0.003039514	138.63	0	-0.01
-15	328	2702.76	137.48	0	137.48	0	-0.01
-14	328	2704.81	137.58	0	137.58	0	-0.01
-13	325	2707.6	137.72	-0.009146341	137.73	-0.01	-0.02
-12	325	2682.44	136.44	0	136.44	0	-0.02
-11	337	2665.4	135.57	0.036923077	135.54	0.04	0.02
-10	342	2650.67	134.83	0.014836795	134.81	0.01	0.03
-9	342	2626.12	133.58	0	133.58	0	0.03
-8	348	2629.29	133.74	0.01754386	133.72	0.02	0.05
-7	354	2674.23	136.02	0.017241379	136.01	0.02	0.07
-6	354	2679.62	136.3	0	136.3	0	0.07
-5	359	2666.1	135.61	0.014124294	135.6	0.01	0.08
-4	355	2644.8	134.53	-0.011142061	134.54	-0.01	0.07
-3	354	2637.69	134.17	-0.002816901	134.17	0	0.07
-2	352	2638.86	134.22	-0.005649718	134.23	-0.01	0.06
-1	352	2621.22	133.33	0	133.33	0	0.06
0	346	2593	131.89	-0.017045455	131.91	-0.02	0.04
1	346	2567	130.57	0	130.57	0	0.04
2	346	2586	131.54	0	131.54	0	0.04
3	339	2586.29	131.55	-0.020231214	131.57	-0.02	0.02
4	334	2607.8	132.64	-0.014749263	132.66	-0.01	0.01
5	340	2667.73	135.69	0.017964072	135.68	0.02	0.03
6	350	2680.75	136.36	0.029411765	136.33	0.03	0.06
7	354	2689.14	136.78	0.011428571	136.77	0.01	0.07
8	325	2707.6	137.72	-0.081920904	137.8	-0.08	-0.01
9	350	2695.24	137.09	0.076923077	137.02	0.08	0.07
10	354	2689.14	136.78	0.011428571	136.77	0.01	0.08
11	356	2689.12	136.78	0.005649718	136.78	0.01	0.09

12	360	2681.15	136.38	0.011235955	136.36	0.01	0.1
13	360	2662.49	135.43	0	135.43	0	0.1
14	360	2647.13	134.65	0	134.65	0	0.1
15	360	2653.02	134.95	0	134.95	0	0.1
16	380	2649.06	134.74	0.055555556	134.69	0.06	0.16
17	387	2648.76	134.73	0.018421053	134.71	0.02	0.18
18	387	2639.83	134.27	0	134.27	0	0.18
19	394	2648.18	134.7	0.018087855	134.68	0.02	0.2
20	401	2688.83	136.77	0.017766497	136.75	0.02	0.22
21	401	2693.18	136.99	0	136.99	0	0.22
22	401	2686.5	136.65	0	136.65	0	0.22
23	412	2686.99	136.67	0.027431421	136.65	0.03	0.25
24	413	2693.71	137.01	0.002427184	137.01	0	0.25
25	420	2682.83	136.46	0.016949153	136.44	0.02	0.27
26	420	2676.91	136.16	0	136.16	0	0.27
27	419	2667.4	135.68	-0.002380952	135.68	0	0.27
28	420	2669.34	135.78	0.002386635	135.77	0	0.27
29	420	2647.27	134.65	0	134.65	0	0.27
30	422	2639.95	134.28	0.004761905	134.28	0	0.27
						0.25	**4.89**
ATHI RIVER MINING							
Observation Day	**Price(KES)**	**NASI**	**NASI Adj (Rit)**	**DR*t***	**NR*it***	**AR*it***	**CARt**
-30	160	3181.45	161.82	0	161.82	0.00	0.00
-29	161	3201.63	162.85	0.006250000	162.84	0.01	0.01
-28	168	3332.14	169.49	0.043478261	169.44	0.04	0.05
-27	168	3352.32	170.51	0.000000000	170.51	0.00	0.05
-26	161	3212.64	163.41	-0.041666667	163.45	(0.04)	0.01
-25	170	3392.23	172.54	0.055900621	172.49	0.06	0.07
-24	170	3408.7	173.38	0.000000000	173.38	0.00	0.07
-23	170	3400.48	172.96	0.000000000	172.96	0.00	0.07
-22	160	3396.83	172.78	-0.058823529	172.84	(0.06)	0.01
-21	169	3429.02	174.42	0.056250000	174.36	0.06	0.07
-20	170	3456.35	175.81	0.005917160	175.80	0.01	0.07
-19	170	3443.94	175.17	0.000000000	175.17	0.00	0.07
-18	170	3461.19	176.05	0.000000000	176.05	0.00	0.07
-17	168	3489.24	177.48	-0.011764706	177.49	(0.01)	0.06
-16	169	3534.27	179.77	0.005952381	179.76	0.01	0.07
-15	170	3554.46	180.80	0.005917160	180.79	0.01	0.07
-14	170	3571.2	181.65	0.000000000	181.65	0.00	0.07
-13	179	3581.33	182.16	0.052941176	182.11	0.05	0.13
-12	180	3579.57	182.07	0.005586592	182.07	0.01	0.13
-11	180	3557.13	180.93	0.000000000	180.93	0.00	0.13
-10	185	3534.53	179.78	0.027777778	179.76	0.03	0.16
-9	187	3546.66	180.40	0.010810811	180.39	0.01	0.17

-8	182	3541.07	180.12	-0.026737968	180.14	(0.03)	0.14
-7	187	3585.12	182.36	0.027472527	182.33	0.03	0.17
-6	185	3611.1	183.68	-0.010695187	183.69	(0.01)	0.16
-5	188	3599.13	183.07	0.016216216	183.05	0.02	0.18
-4	196	3599.18	183.07	0.042553191	183.03	0.04	0.22
-3	196	3585.93	182.40	0.000000000	182.40	0.00	0.22
-2	196	3589.43	182.58	0.000000000	182.58	0.00	0.22
-1	196	3599.33	183.08	0.000000000	183.08	0.00	0.22
0	201	3628.64	184.57	0.025510204	184.54	0.03	0.24
1	205	3637.08	185.00	0.019900498	184.98	0.02	0.26
2	204	3655.07	185.91	-0.004878049	185.92	(0.00)	0.26
3	200	3677.81	187.07	-0.019607843	187.09	(0.02)	0.24
4	197	3699.69	188.18	-0.015	188.20	(0.01)	0.23
5	197	3708.88	188.65	0	188.65	0.00	0.23
6	199	3672.36	186.79	0.010152284	186.78	0.01	0.24
7	199	3678.02	187.08	0	187.08	0.00	0.24
8	197	3668.21	186.58	-0.010050251	186.59	(0.01)	0.23
9	196	3634.85	184.89	-0.005076142	184.89	(0.01)	0.22
10	196	3618.53	184.06	0	184.06	0.00	0.22
11	196	3627.64	184.52	0	184.52	0.00	0.22
12	195	3626.07	184.44	-0.005102041	184.44	(0.01)	0.21
13	196	3650.85	185.70	0.005128205	185.69	0.01	0.22
14	150	3653.29	185.82	-0.234693878	186.06	(0.23)	0.01
15	199	3635.86	184.94	0.326666667	184.61	0.33	0.34
16	196	3634.82	184.88	-0.015075377	184.90	(0.02)	0.32
17	199	3651.27	185.72	0.015306122	185.71	0.02	0.34
18	199	3639.46	185.12	0	185.12	0.00	0.34
19	200	3657.01	186.01	0.005025126	186.01	0.01	0.35
20	200	3670.18	186.68	0	186.68	0.00	0.35
21	200	3670.75	186.71	0	186.71	0.00	0.35
22	200	3685.36	187.45	0	187.45	0.00	0.35
23	201	3694.23	187.91	0.005	187.90	0.00	0.35
24	201	3682.23	187.30	0	187.30	0.00	0.35
25	202	3663.11	186.32	0.004975124	186.32	0.00	0.35
26	203	3694.55	187.92	0.004950495	187.92	0.00	0.35
27	202	3682.24	187.30	-0.004926108	187.30	(0.00)	0.35
28	200	3704.7	188.44	-0.00990099	188.45	(0.01)	0.34
29	197	3725.55	189.50	-0.015	189.51	(0.01)	0.33
30	202	3738.15	190.14	0.025380711	190.11	0.03	0.36
						0.32	**11.92**
KENYA POWER & LIGHTING COMPANY LIMITED							
Observation Day	**Price(KES)**	**NASI**	**NASI Adj (Rit)**	**DR*t***	**NR*it***	**AR*it***	**CARt**
-30	206	10049	511.14	0	511.14	0	0
-29	208	9954	506.31	0.009709	506.3	0.01	0.01

-28	207	9839	500.46	-0.00481	500.46	0	0.01
-27	206	9780	497.46	-0.00483	497.46	0	0.01
-26	207	9631	489.88	0.004854	489.87	0	0.01
-25	208	9613	488.96	0.004831	488.96	0	0.01
-24	206	9593	487.95	-0.00962	487.95	-0.01	0
-23	207	9578	487.18	0.004854	487.18	0	0
-22	206	9611	488.86	-0.00483	488.87	0	0
-21	206	9558	486.16	0	486.16	0	0
-20	210	9514	483.93	0.019417	483.91	0.02	0.02
-19	212	9519	484.18	0.009524	484.17	0.01	0.03
-18	216	9538	485.15	0.018868	485.13	0.02	0.05
-17	225	9560	486.27	0.041667	486.22	0.04	0.09
-16	242	9559	486.22	0.075556	486.14	0.08	0.17
-15	237	9698	493.29	-0.02066	493.31	-0.02	0.15
-14	232	9776	497.25	-0.0211	497.27	-0.02	0.13
-13	236	9781	497.51	0.017241	497.49	0.02	0.15
-12	245	9843	500.66	0.038136	500.62	0.04	0.19
-11	251	9821	499.54	0.02449	499.52	0.02	0.21
-10	248	9868	501.93	-0.01195	501.94	-0.01	0.2
-9	245	9833	500.15	-0.0121	500.16	-0.01	0.19
-8	238	9838	500.41	-0.02857	500.44	-0.03	0.16
-7	242	9779	497.41	0.016807	497.39	0.02	0.18
-6	237	9840	500.51	-0.02066	500.53	-0.02	0.16
-5	237	9868	501.93	0	501.93	0	0.16
-4	236	9892	503.15	-0.00422	503.16	0	0.16
-3	238	9915	504.32	0.008475	504.32	0.01	0.17
-2	237	9938	505.49	-0.0042	505.5	0	0.17
-1	237	10009	509.1	0	509.1	0	0.17
0	242	10059	511.65	0.021097	511.63	0.02	0.19
1	236	10032	510.27	-0.02479	510.3	-0.02	0.17
2	234	10053	511.34	-0.00847	511.35	-0.01	0.16
3	232	10029	510.12	-0.00855	510.13	-0.01	0.15
4	231	10045	510.94	-0.00431	510.94	0	0.15
5	231	10084	512.92	0	512.92	0	0.15
6	232	10127	515.11	0.004329004	515.1	0	0.15
7	232	10191	518.36	0	518.36	0	0.15
				-			0.15
8	231	10277	522.74	0.004310345	522.74	0	0.15
				-			0.15
9	227	10290	523.4	0.017316017	523.42	-0.02	0.13
10	228	10234	520.55	0.004405286	520.54	0	0.13
11	228	10195	518.57	0	518.57	0	0.13
12	228.05	10171	517.34	0.000219298	517.34	0	0.13
				-			0.13

13	223	10273	522.53	0.022144267	522.56	-0.02	0.11
14	224	10256	521.67	0.004484305	521.66	0	0.11
				-			0.11
15	223	10166	517.09	0.004464286	517.1	0	0.11
				-			0.11
16	222	10195	518.57	0.004484305	518.57	0	0.11
				-			0.11
17	220	10195	518.57	0.009009009	518.57	-0.01	0.1
18	220	10227	520.19	0	520.19	0	0.1
				-			0.1
19	218	10188	518.21	0.009090909	518.22	-0.01	0.09
				-			0.09
20	214	10136	515.56	0.018348624	515.58	-0.02	0.07
				-			0.07
21	212	10179	517.75	0.009345794	517.76	-0.01	0.06
				-			0.06
22	211	10151	516.33	0.004716981	516.33	0	0.06
23	211	10075	512.46	0	512.46	0	0.06
24	214	10062	511.8	0.014218009	511.79	0.01	0.07
25	219	10052	511.29	0.023364486	511.27	0.02	0.09
26	225	10073	512.36	0.02739726	512.33	0.03	0.12
				-			0.12
27	28	10071	512.26	0.875555556	513.13	-0.88	-0.76
28	29.5	10038	510.58	0.053571429	510.53	0.05	-0.71
29	29.75	10017	509.51	0.008474576	509.5	0.01	-0.7
				-			-0.7
30	27.75	9963	506.77	0.067226891	506.83	-0.07	-0.77
						-0.78	3.72
EAST AFRICAN CABLES LIMITED							
Observation Day	**Price(KES)**	**NASI**	**NASI Adj (Rit)**	**DR*t***	**NR*it***	**AR*it***	**CARt**
-30	267	4239.96	215.66	0	215.66	0	0
-29	270	4260.49	216.71	0.011235955	216.7	0.01	0.01
-28	278	4273.17	217.35	0.02962963	217.32	0.03	0.04
-27	270	4263.59	216.87	-0.028776978	216.9	-0.03	0.01
-26	273	4274.25	217.41	0.011111111	217.4	0.01	0.02
-25	280	4246.38	215.99	0.025641026	215.97	0.03	0.05
-24	300	4271.72	217.28	0.071428571	217.21	0.07	0.12
-23	301	4271.99	217.29	0.003333333	217.29	0	0.12
-22	326	4278.18	217.61	0.083056478	217.53	0.08	0.2
-21	329	4271.1	217.25	0.009202454	217.24	0.01	0.21
-20	331	4276.43	217.52	0.006079027	217.51	0.01	0.22
-19	330	4272.5	217.32	-0.003021148	217.32	0	0.22
-18	330	4271.37	217.26	0	217.26	0	0.22
-17	330	4246.38	215.99	0	215.99	0	0.22

-16	331	4246.44	215.99	0.003030303	215.99	0	0.22
-15	332	4242.51	215.79	0.003021148	215.79	0	0.22
-14	330	4244.16	215.88	-0.006024096	215.88	-0.01	0.21
-13	331	4245.29	215.94	0.003030303	215.93	0	0.21
-12	331	4251.37	216.24	0	216.24	0	0.21
-11	331	4268	217.09	0	217.09	0	0.21
-10	332	4260.64	216.72	0.003021148	216.71	0	0.21
-9	330	4271.68	217.28	-0.006024096	217.28	-0.01	0.2
-8	332	4263.59	216.87	0.006060606	216.86	0.01	0.21
-7	331	4242.5	215.79	-0.003012048	215.8	0	0.21
-6	353	4277.3	217.56	0.066465257	217.5	0.07	0.28
-5	363	4314.44	219.45	0.028328612	219.42	0.03	0.31
-4	364	4240.88	215.71	0.002754821	215.71	0	0.31
-3	384	4384.35	223.01	0.054945055	222.95	0.05	0.36
-2	399	4390.95	223.34	0.0390625	223.31	0.04	0.4
-1	399	4396.09	223.61	0	223.61	0	0.4
0	477	4396.61	223.63	0.195488722	223.44	0.2	0.6
1	524	4407.54	224.19	0.098532495	224.09	0.1	0.7
2	571	4414.88	224.56	0.089694656	224.47	0.09	0.79
3	585	4429.49	225.3	0.024518389	225.28	0.02	0.81
4	586	4423.6	225.01	0.001709402	225	0	0.81
5	578	4424.17	225.03	-0.013651877	225.05	-0.01	0.8
6	525	4451.08	226.4	-0.091695502	226.49	-0.09	0.71
7	501	4467.4	227.23	-0.045714286	227.28	-0.05	0.66
8	478	4442.5	225.97	-0.045908184	226.01	-0.05	0.61
9	480	4467.36	227.23	0.0041841	227.23	0	0.61
10	527	4488.56	228.31	0.097916667	228.21	0.1	0.71
11	570	4469.6	227.34	0.081593928	227.26	0.08	0.79
12	587	4476.07	227.67	0.029824561	227.64	0.03	0.82
13	592	4489.6	228.36	0.008517888	228.35	0.01	0.83
14	592	4507.15	229.25	0	229.25	0	0.83
15	595	4486.07	228.18	0.005067568	228.18	0.01	0.84
16	602	4490.84	228.43	0.011764706	228.41	0.01	0.85
17	645	4481.7	227.96	0.071428571	227.89	0.07	0.92
18	77.5	4496.47	228.71	-0.879844961	229.59	-0.88	0.04
19	84.5	4507.99	229.3	0.090322581	229.21	0.09	0.13
20	92	4508.02	229.3	0.088757396	229.21	0.09	0.22
21	100	4523.8	230.1	0.086956522	230.01	0.09	0.31
22	103	4585.94	233.26	0.03	233.23	0.03	0.34
23	105	4601.22	234.04	0.019417476	234.02	0.02	0.36
24	94.5	4645.56	236.3	-0.1	236.4	-0.1	0.26
25	85.5	4684.57	238.28	-0.095238095	238.37	-0.1	0.16
26	77	4750.8	241.65	-0.099415205	241.75	-0.1	0.06
27	69.5	4839.24	246.15	-0.097402597	246.24	-0.1	-0.04

28	63	4871.76	247.8	-0.09352518	247.89	-0.09	-0.13
29	61.5	4876.13	248.02	-0.023809524	248.05	-0.02	-0.15
30	62	4769.13	242.58	0.008130081	242.57	0.01	-0.14
						-0.13	**20.94**

CARBACID INVESTMENTS LIMITED							
Observation Day	**Price(KES)**	**NASI**	**NASI Adj (Rit)**	**DRt**	**NRit**	**ARit**	**CARt**
-18	146	4669.85	237.53	0	237.53	0.00	0.00
-17	147	4648.21	236.43	0.006849315	236.42	0.01	0.01
-16	147	4659.85	237.02	0	237.02	0.00	0.01
-15	146	4677.6	237.92	-0.006802721	237.93	-0.01	0.00
-14	147	4708.95	239.52	0.006849315	239.51	0.01	0.01
-13	146	4722.89	240.23	-0.006802721	240.24	-0.01	0.00
-12	146	4732.92	240.74	0	240.74	0.00	0.00
-11	146	4715.34	239.84	0	239.84	0.00	0.00
-10	142	4751.82	241.70	-0.02739726	241.73	-0.03	-0.03
-9	140	4729.3	240.55	-0.014084507	240.57	-0.01	-0.04
-8	147	4793.2	243.80	0.05	243.75	0.05	0.01
-7	153	4830.38	245.70	0.040816327	245.66	0.04	0.05
-6	153	4838.07	246.09	0	246.09	0.00	0.05
-5	154	4841.33	246.25	0.006535948	246.25	0.01	0.06
-4	155	4881.44	248.29	0.006493506	248.29	0.01	0.06
-3	157	4930.79	250.80	0.012903226	250.79	0.01	0.08
-2	156	4946.02	251.58	-0.006369427	251.58	-0.01	0.07
-1	145	4925.96	250.56	-0.070512821	250.63	-0.07	0.00
0	230	4953.84	251.98	0.586206897	251.39	0.59	0.58
1	215	4949.65	251.76	-0.065217391	251.83	-0.07	0.52
2	213	4935.91	251.06	-0.009302326	251.07	-0.01	0.51
3	205	4940.32	251.29	-0.037558685	251.33	-0.04	0.47
4	208	4970.88	252.84	0.014634146	252.83	0.01	0.49
5	212	4992.88	253.96	0.019230769	253.94	0.02	0.51
6	215	4989.97	253.81	0.014150943	253.80	0.01	0.52
7	226	4964.42	252.51	0.051162791	252.46	0.05	0.57
8	235	4954.69	252.02	0.039823009	251.98	0.04	0.61
9	240	4990.24	253.83	0.021276596	253.81	0.02	0.63
10	260	5017.78	255.23	0.083333333	255.14	0.08	0.72
11	254	5019.18	255.30	-0.023076923	255.32	-0.02	0.69
12	242	5027.28	255.71	-0.047244094	255.76	-0.05	0.65
13	242	5031.02	255.90	0	255.90	0.00	0.65
14	240	5026.82	255.69	-0.008264463	255.70	-0.01	0.64
15	235	5030.76	255.89	-0.020833333	255.91	-0.02	0.62
16	231	5043.58	256.54	-0.017021277	256.56	-0.02	0.60
17	40	5058.16	257.28	-0.826839827	258.11	-0.83	-0.23
18	38.25	5052.63	257.00	-0.04375	257.04	-0.04	-0.27
19	38.5	5024.08	255.55	0.006535948	255.54	0.01	-0.26

20	39.75	5053.91	257.07	0.032467532	257.03	0.03	-0.23
21	43.5	5054.21	257.08	0.094339623	256.99	0.09	-0.14
22	47.5	5068.36	257.80	0.091954023	257.71	0.09	-0.05
23	52	5085.83	258.69	0.094736842	258.59	0.09	0.05
24	56.5	5125.74	260.72	0.086538462	260.63	0.09	0.14
25	61.5	5137.21	261.30	0.088495575	261.21	0.09	0.22
26	67	5100.88	259.45	0.089430894	259.37	0.09	0.31
						0.31	**9.84**

Source: Research Findings