

**AN EMPIRICAL EXAMINATION OF THE RELATIONSHIP BETWEEN STOCK
SPLITS AND STOCK PERFORMANCE OF FIRMS LISTED ON NAIROBI STOCK
EXCHANGE (NSE)**

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D61/P/8443/04

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT FOR THE
REQUIREMENT OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF
BUSINESS, UNIVERSITY OF NAIROBI**

OCTOBER, 2011

DECLARATION

This research is my original work and has not been submitted to any other college or University for academic credit.

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ACKNOWLEDGEMENT

I would like to convey my gratitude to the following for providing me an enabling environment. Most heartedly thanks to my family for constantly giving me motivation to invest my time in studies and it is indeed fortunate to have them in my life.

My deepest thanks to my supervisor who shepherd me through, by giving rigorous oversight to my work; and those all who made invaluable comments about the work.

I would like to extend my appreciation to the University of Nairobi fraternity, my gratitude to colleagues, friends alike. My mother Namulembo and Nabonue are mentioned last to appreciate their prayers through my candidature.

Above all, I thank the almighty God for the grace in my life.

Wycliffe Wanga.

DEDICATION

To

My Beloved wife

Charity

Children

Roy and Rodney

ABSTRACT

This study analyzes the impact of stock split on stock return and trading volume, of listed company in Nairobi Stock Exchange. The study is based on daily return data of listed firms on the NSE for period from 2004 to 2011. The results confirm finding as in other markets, investor react positively to splits announcements. At the execution date of stock splits, there is a significant abnormal return on the three days after split.

The study provides evidence that split cause trade friction at the announcement and execution dates. Pre announcement statistical results are significant compared to post date though positive less significant. Trade volume tending to split date decrease and statistically increase after the split. The study confirms investors' behavior overreaction at the announcement and execution led to momentum short run abnormal return and liquidity.

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CHAPTER ONE

INTRODUCTION

1.1. Background

Stock splits have become common phenomenon in the Kenya Stock Market from the mid of the decade of the 2000, with the first ever split announcement to be found in 2004. In 2005 no split was done until 2006 onward, where a relative high frequency of splits in stock market have been observed, 11 companies about 18% of firms listed on the NSE; splits were common when the market is bullish.

In theory, a share split is a corporate action that increases the number of the company's outstanding shares by dividing each share, which in turn decreases the share price, but without diluting its market capitalization; there is no value creation in the process. At face value, share splits are purely cosmetic changes as stated by Lakonishok and Lev (1987), finer slicing of a given 'cake'; of the total market value of the firm; such should not have an effect on the firm and investors. Leemakdej (2007) states that stock split occur when a firm adjusts par value of its stock. When the firm lowers the par value by half, these double the number of shares outstanding.

This management action does not affect a corporation's future cash flows, the proportionate ownership of shareholders, but it involves administrative costs which can be substantial for large companies hence friction in pricing of stocks. Fama *et al.* (1965) assumed rationality in a market where market players access information and is freely available and there is not an excess profit to be earned. In such an ideal situation, herein, a perfect market splits does not alter market value

and create shareholder wealth simply through a paper transaction that changes the number of shares outstanding. The argument, however, that split is pure accounting transaction with no economic value has been empirically challenged by the study of events in stock markets; with score of significant market reaction. Muscarella and Vetsuypens (1996) states that Stock splits should not have an effect on firm value in perfect capital markets, on the contrary stock prices increase on split announcements.

Research has documented a wide range of effects such as increased volatility, larger proportional spreads, and greater transaction costs following splits. Firms that split stock have higher short – term earnings growth than firms that fail to split. Findings by Lakonishok and Lev (1987) and McNichols and Dravid (1990) relate between split and excess earning in short term, therefore, the need for stock split by a firm remains a field for numerous studies.

These studies focused on short term earnings and it is not evident whether the private information explains long term earnings. Stock price valuation effect on the announcement date has been explained fundamentally by informative content of the stock split. Gomez-Sala (2006) argues that the behavior of stock prices on the split ex-date, information which is well known to investor is difficult to discern, therefore abnormal returns can be associated with increase in stock liquidity. Conroy *et al* (1990) suggests that stock splits are used to adjust price to a ‘normal’ trading range and managers appear to engineer splits to return company’s share prices to a particular stable price over time.

What motivates this corporate decision is a puzzle and mainly hypothesized. The underlying perception in stock split is that companies that split stock are likely to attract new investors and shove the investors' confidence in management at the disclosure of private information. Fama (1969) suggest that the management only pronounce information that elicit positive reaction and would reluctantly act on the contrary. Managers are therefore optimistic and only split if the future promises positive return and splits enhance marketability of shares by restoring the prices to preferred trading range and improve liquidity. High priced stocks are illiquid due to psychological reasons and transactions costs, Shiller (1990) and when stocks become expensive a split bring it back to the optimal trading range; Conroy et al (1999).

Stock Exchange is a market that deals in securities, its efficiency is dictated by operational environment; the country market structure, legislation and level of development greatly influences the market performance. In Kenya, NSE is the principal exchange market with trading history since 1954 when it was constituted. In the East African it is the largest exchange in terms of trading volume and market capitalization. Trading on NSE has been automated since 2006, replacing floor open cry trading system. (Source: Wikipedia) and the NSE performance is measured by NSE-20 share index which has been in use since 1964; it measure performance of 20 firms with strong fundamentals. In 2008 an alternative index was introduced; Nairobi Stock Exchange All Index (NASI), the focus is on all traded shares, that is market capitalization rather than price movement of selected 20 firms.

Cross trading is an emerging trend in East African Exchanges where investors seeking to diversify their portfolio of investments and venture into regional markets This has been made possible by technological advancement and liberalization of capital flows, fostering competition

split announcement result in positive cumulative abnormal returns unlike Wulff (2002) for German market find less significant returns around the day of stock split these could be as a result of different samples used in both studies. Leung *et al* 2005 investigated the Hong Kong market and find abnormal returns around announcement date; Chemmanur Hu and Huang (2008) find that institution make abnormal profits during the post split period.

Contrary, Mishra (2007) find that the overall abnormal returns after the split are negative in India Stock market, this wipes out the gains pre- split. The study rejects signalling hypothesis to which splits convey positive information to the market. Leemakdej (2007) find negative abnormal returns around the execution date in Thailand Stock market, contrast to studies in USA and Canada that noted positive returns. Huang, Liano and Pan (2002) find little evidence that stock split is positively associated with future profitability; the study investigated long term performance of the firm earning.

The impact of split deserves careful investigation as signalling profitability has yielded varied results. Desai et al. 1998 find significant increase in the volatility after the split contrast to pre-split; Guo and Zhou (2006), results about liquidity shows enhancement after the split. Copeland (1979) find lower trading volume after stock split and bid-ask spread increase, Conroy *et al* (1990) find less statistically significant effect on liquidity; therefore no consensus emerges from these studies.

Further available studies show that markets variably react to stock splits, as key market players the stock brokers are motivated to avail information about split in the market, Brennan and

Hughes (1991). The retail investors view stock splits as high potential trading opportunities and positive progression in value for the company Easley, O'Hara and Saar (2000). The price push up by retail investors who feel the stock is affordable may adversely select to invest in stock. Studies fail to observe the market under reaction to corporate news events; Ikenberry and Ramnath (2002) note that analyst' earnings forecasts are comparatively low at the time of the split announcement and revise sluggishly over time.

There seem not unanimous findings of impact of stock split and studies available locally are less to provide a satisfactory inference. This study is to provide additional insight by analyzing and documenting stock performance at around split announcement and execution dates, of listed firms on NSE. The Kenya data provide basis for assessing the market behavior given that the previous studies centered on the USA stock market with high volume of stock splits and trading compared to the less developed NSE.

The investors were certainly affected by the stock split happening and their behavior changes impacted the market characteristics of the stocks. There are limited studies available on price behavior on the event of stock announcement and split on NSE. The finding gives a comprehensive explanation on the empirical results of the trading characteristics change around the stock splits and investigates the trading volume surrounding the ex-split day. The capital market levels of development between the sub-Saharan stock market and the US and Asia markets are different and this influence market behavior and elicit varied results; it may not be prudent to generalize the findings in these markets and relate to NSE.

1.3. Objective of the study

The objective of this study is:

To assess stock performance of listed firms at the announcement and execution dates of stock split.

1.4. Significance of the study

In the recent past there has been growing interest by retail investors in NSE besides institutional investors like banks, pension funds and fund managers, Mbaru (2006). The Government has also initiated reforms in the capital market to ensure ethical trading practices. The findings of the study are therefore relevant to the following interest groups.

The management of companies whose performance may be measured based on the stock performance. The Corporate Strategic management of a firm's value would depend on how management communicates information about the firm to the investors. Value of a firm may be at a discounted price and this study will assist managers of such firms how to bring up prices to a more realistic level especially in small emerging market like NSE.

The investors; Individuals, Corporate and intermediaries; the return on investment is the primary motive and a marketable stock may signal value to an investor. The investors' interest is to have the firm value at the true market price; positive market reaction to splits may motivate investors.

To the investor, existence of return pattern, provide an opportunity for investing.

The market regulators; Capital market Authority and the Nairobi Stock Exchange; market behavior is of concern. Market reaction to events in any market may signal weak or strong

regulatory framework hence reviews. Weak market system may also reflect governance challenges which may be reflected in stock pricing, hence market reaction to new information.

The study will contribute to further research in capital markets and the existing pool of research work and link the studies in developed economies and an emerging capital market such as Kenya and this will also be a basis for future reference to researchers and investors.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical explanation for stock splits, empirical studies in developed market and some of the factors in emerging markets.

2.2 Theoretical review

Empirical studies of many stock markets, report evidence of positive market reaction to stock split announcement and the hypotheses that have been cited to explain market reaction are the signaling hypothesis, the trading range hypothesis, the liquidity hypothesis and attention seeking firms. A large number of findings rally evidence of positive reaction to stock split mainly from studies in US, Asia capital markets as well as European Markets.

2.2.1 Signaling Hypothesis

In a scenario of information asymmetry between managers and investors, the management may use stock splits to signal positive information to the market about firm's future earnings. Credible splits are associated with "unusual" returns and can be accounted for and the investor can separate improper information. This implies that market reaction to split announcement, provide evidence that the market is efficient as the prices adjust/ revaluates to reflect the new information on the market. Fama (1969) find evidence that stock splits are an instrument for signalling increases in earnings and future dividends. The executives of undervalued firms try to make public all the positive information they have at their disposal and that is not known by the market, in order to approximate prices to the real value of the firm. Li and Lin (2009) support the

finding that managers are motivated to share positive information with uninformed investors hence reason for signalling better performance.

Lakonishok and Lev (1987) confirm previous findings that splitting firms enjoyed an unusually favourable earnings performance during presplit period relative to similar, non splitting firms. The post split earning persist in the first year though not substantially higher than pre-announcement period. The study provides support for the signalling motive of stock split. Splitting firms indicated fairly higher growth in earning after the split announcement. It does not proxy for cost to releasing the information about stock split and the growth in earning can only be subject of moral hazard..

Leung *et al* 2005 find insider abnormal buying and selling activities before split and positive share price performance signal favourable information to the market. Kyle (1985) suggested the insider makers' makes positive profits by exploiting monopoly position optimally. The managers hold that position and releasing information signal credible information. Management declares stock splits to convey favorable private information about the current value of a firm since they obtain pertinent information about the future because of their expertise in making operating and investment decision.

Brennan and Copeland (1988) assert that splits signal credible managerial information as transaction costs followings splits increase, they developed transactions cost model that assumed fixed cost of brokerage commissions increase per share. This negates the efficient market theory since transaction costs associated with splitting of stock are compensated in pricing of the stock.

Brennan and Hughes (1991) argue that stock splits increase the incentive of brokers (and financial analysts) to produce information about the splitting firm, thereby ensuring that the firm's stock is correctly priced. The market makers are compensated for the information they produce and supply the market; thus stock splits are costly and impose costs to shareholders

Lamoureux and Poon (1987) provide explanation that stock splits are associated with change in volatility and increase in tax option value of the stock; this leads to increase in stock price. They argue that subsequent to announcement of splits, a chain of events is triggered; the daily transactions of share trading may increase or decrease. The increase in volume results in increase in the noise of security's return process.

Ikenberry, Rankine and Stice (1996); observe significant post-split excess returns of 7.93 percent in the first year and 12.15 percent in the first three years. These excess returns follow an announcement return of 3.38 percent, indicating that the market under reacts to split announcements. The evidence suggests that splits realign prices to a lower trading range, but managers self-select by conditioning the decision to split on expected future performance

Therefore communicating such information reduces information asymmetry between the management and the stakeholders and adjusts the price to higher equilibrium values, Louis and Robinson (2003). The signals are deemed to be credible by the market and the effect is to the stock prices and very little effect on firm's future earnings.

2.2.2 Trading Range Hypothesis.

The hypothesis hold that there exist an optimal trading prices and stock splits are used to realign the share price to a desired price range. A survey by Baker and Gallagher (1980) of managerial

attitude towards stock split of NYSE listed firms reported that they did so to provide a better trading range and thereby attract investors and enhance trading liquidity. The finding by Copeland (1979), the trading range theory, observed that investor's base hence trading volume increase as the price are adjusted within affordable range. Consequently, when stock prices are too high, a split should be undertaken so that small investors can afford to buy the stock. If the pre-split share price is high then a stock split is justified for improving the marketability.

Lakonishok and Lev (1987); McNichols and Dravid, (1990); find that stock splits are carried out by firms that have experienced exceptional growth in their stock price. The splits return the share prices to market and industry-wide price ranges. Easley, O'Hara and Saar (2000.), study finds that uninformed trading increases following splits, and that there is a slightly increased tendency of uninformed buyers to execute trades using market orders. Pavabutr and Sirodom (2008) in a study of Thailand stock Exchange provide evidence that stock with higher split factors have better post split adjusted price performance. Market participants who prefer certain trading range increase with higher split factor.

Baker and Gallagher (1980) noted that low priced stocks are attractive to retail investors and this increase shareholders base, this technically limit institutional management control as the shareholding is widely spread. Dyl et al (2006) find that split is a deliberate attempt to manage share prices and firms' share prices are manipulated to reflect the required value of investors; this point to the desire of management to assert control. The need to attract a specific clientele or a particular dispersion in ownership reflects the view that greater liquidity for stocks may occur in certain price ranges; appealing to small investors for market stability; Stovall (1995). Secondly

management may desire to diffuse ownership mix since small investors cannot exercise much control over them; Baker and Powell (1993). The studies point to the argument of affordability as a motivational factor for stock split and related to this is the liquidity hypothesis.

2.2.3 Liquidity Hypothesis

The desire to improve liquidity motivate the management of a firm to splits shares to enhance the attractiveness of shares to investors by restoring prices to a preferred trading range hence liquidity, study by Baker and Powell (1993) reveal that the main motivation for share split is for improved liquidity. Firms whose stock are less liquid tend to choose higher split factor which result in improved liquidity. Dhar et al 2004 examined the shift in clientele around stock split; investors increase post split as institutional investors diminish.

Investors expect compensation for illiquid stocks; Acharya and Pedersen (2005) ascertained that liquidity risk affects required returns negatively because investors pay a premium for assets with high return in firms of market illiquidity. Amihud (2000) finds that illiquidity attracts a risk premium and expected stock excess returns vary over time as a function of changes in market illiquidity. Amihud and Mendelson (1986) developed theoretical model that suggest an excess return reflect compensation for expected market illiquidity, and the finding explain increase in return variance following stock split. Further, Admati and Pfleiderer (1988) find splits not only attract informed traders, but also noisy traders who react to lower post split prices hence liquidity.

Pastor and Stambaugh (2003) conclude that stock with returns that positively correlate with market liquidity should have high expected returns. The findings are that the average returns on

stocks with high sensitivity to liquidity exceeds that for stocks with low sensitivity by 7.5% annually adjusted for exposures to the market returns as well as size and value. Study by Merton (1987); indicate that an increase in the relative size of firm's investor base will reduce cost of capital and increase the firm's value. This is an incentive to managers to increase investor base not only to achieve diverse shareholding and attract small investors to low prices hence liquidity also increase the market value of the firm. The proponents of this theory therefore support the argument that management split stock to improve liquidity.

2.2.4 Small Firm Hypothesis

The theory holds that stock split, is an attempt by firms to draw attention; under priced firms will get more attraction when they announce splits; Grinblatt et al, 1984, The motivation is to draw the prices to more comparable firms in the industry. The split cause the investors to re-evaluate undervalued company value and incite demand for dormant stock.

Grinblatt, Masulis, and Titman (1984) established that, on average, there is a significant increase in a firm's stock price at the announcement and that; in general, this upward revision of the firm's value cannot be attributed to any other period but announcements. This increase may be partially due to forecasts of imminent increases in cash dividends. Thus, some of the information content of stock distributions appears to be directly associated with firms' future cash flows. Kalay *et al.* (2007) find that stock splits are more likely to be motivated by attention the firm draws from retail investors, trading tend to increase around announcement dates and the earning can be explained by the information.

Arbel and Swanson (1993); states that a firm not known well, its shares are traded at a discount, thus stock split draws the attention to ensure that information about the firm is widely recognized. Peress (2008) noted that investors' inattention contributes to the post-earnings announcement drift. Using media coverage to measure attention, announcements were made and compared with control firms. Announcements with media coverage generated stronger price and trading volume reactions upon announcement and less subsequent drift. The results of the study proved to be both economically and statistically positive. Hence, limited attention is an important source of friction in markets and split announcement can just be used to achieve that goal.

2.3. Empirical Studies in Stock Markets

Stock markets are normally assumed to be efficient in relation to the instantaneous incorporation of all known and new arriving information into prices of securities Fama (1969). Studies in developed capital markets assessing the efficiency of capital markets have reported mixed results, some of which are against the efficient markets theory. The market efficiency in capital market theory is used to explain to what extent the stock prices reflect all available, relevant information. Stock split announcement effect is a case of event study; in an efficient market, on average the firms that split should not record abnormal returns after the split.

Wulff (2002), in his study of the Germany Capital Market; noted that the market reaction to stocks splits, provides evidence from the market that are similar to US market; stock splits are associated with abnormal returns on both the announcement and execution date. The difference between German stock splits and its U.S. is the requirement of par value of stocks. Most stock issued by a corporation in the U.S. has a par value, which was not the case in Germany. The scope for German companies to split their stock was limited by the minimum par value

requirement of the German regulations, once a company's stock is traded at the minimum par value; no further splits were possible.

Zagonov, Staikouras and Kalotychou (2007) provide similar results in the study on the UK stock market. These excess returns are partially predictable using the publicly available information prior to the ex-split date, stock volatility increases post-split and it is positively related to trading activity. The existence of post split excess return is rather perplexing since the information is available in advance. The results suggest a strong relationship between trading activities and return volatility over the pre and post splits periods.

Kryzanowski and Zhang (1991) found on average abnormal returns recorded on announcement dates for stocks examined on the Toronto Stock Exchange (TSE). The mean abnormal return is positive and statistically significant for the split proposal announcement date, and positive and not statistically significant for the split approval date. These findings were consistent with those found for stock splits in the US, Grinblatt, Masulis and Titman (1984).

Elfakhani and Lung (2003) examined the market behavior of two year before and after the announcement event and show decrease in bid-ask spreads, trading volume increase and enhanced liquidity. The situation in Canada as in the United States, stock split announcements in Canada resulted in positive cumulative abnormal returns.

Kunz (2008), study of Switzerland noted that the existence of a mandatory minimum par value inhibited many companies from splitting their stocks as they already traded at their minimum par

value. Review of the legal requirement provided rare opportunities to distinguish between stock splits that signal a permanent increase in stock price and splits that are merely a reaction to a regulatory change and thus have other motives. The study recorded significant return in line with the hypothesis that splits are a means to send positive signals to the stock market.

The findings of positive excess returns are not confined to the American market, Wu and Chan (1997) find excess returns on the Hong Kong stock exchange. Examining 67 splits in the period from 1986 to 1992, the excess return over the three days surrounding a split announcement amounted to 18.2% excess return. The analysis showed that stock splits are associated with a positive and significant stock market response, while reverse stock splits are associated with a negative but statistically insignificant price effect. They also investigate the "optimal price range" hypothesis, which states that firms choose the split factor as a device to return the stock price to a "preferred price range".

Gomez -Sala (2006); study of the Spanish capital market found that splits generate on average positive abnormal returns of 0.95%, only on the ex-date. Guo (2006) in the study of the Tokyo exchange indicate that the events of stock splits affect the quality of splitting stock. The behavior change in investors causes the change in market characteristics of the splitting stocks. They find, increased trading activities, enhanced market liquidity, reduce the information asymmetry and lower the probability of informed trading.

In Kenya studies tested the market efficiency; Njuru (2007) study of stock dividend announcement on NSE finds that announcements incite positive returns and investors underreact to announcements. Mbugua (2004) analyzed companies that issued stock dividend and record an impact on stock returns, the stock price behavior point to investors' reaction to new information

on NSE. Simbovo (2006) noted increased liquidity upon stock splits and stock dividend announcement. The findings however, did not review the stock performance in relation to returns at the announcement and execution date. The study noted that pre-split demand pressure pushed up the prices as retail investor moved in to benefit from the split, liquidity increased, these reflect market sensitivity to arriving information and market efficiency.

A general outlook of the empirical studies of stock market is that stock price valuation effect is attributed to split announcement. In most findings there has been an increase returns in and trade volatility during the announcement and ex-date of stock split. The positive abnormal returns in US stock splits have also been experienced in different stock exchanges.

2.4. NSE: Emerging Capital Market

Kibuthu (2005) , in study of Capital markets in emerging economies with case study of NSE observed that there are institutional challenges in terms of the stage of development of Kenya market. Well established equity markets have less volatile, more price efficient market with substantial liquidity. Emerging markets as Kenya are highly concentrated; they are underdeveloped, small and illiquid, exhibiting pricing volatility error. The more integrated the market to international market the more volatile the returns.

Generally, inefficiency is inherent in emerging markets, Dickinson and Muragu, 1994; provided empirical results from NSE that was consistent with weak-form efficiency market. In this case it is unlikely to earn abnormal returns by simply using historical prices/returns. The market specific factors that affected the NSE were Liquidity issues, trading and settlement infrastructure, corporate governance practices of listed companies and market depth and breadth. The NSE is a young market facing technological and legal challenges. New financial instruments have also

come up in the market like infrastructural bonds; all these influence the trading on the NSE. The management's scope to decide to split stocks is limited by the regulatory constraints; the shareholders and the Capital Market Authority approvals. Another regulatory limitation is the taxation.

These events are recent phenomenon on the Kenya capital market and drawing a parallel with what is happening on US or Canada stock exchange it is a challenge because of the market structure. In global market any noise in financial markets cause a ripple effect, the markets react promptly and uncharacteristically to rumors of war, change in regulatory environment (business), political upheavals seen as negative by the business (investing) community, vagaries of nature and general interest rate behavior. www.moneybiz.co.ca/

2.5 Literature review summary

The review suggests that split announcements provide information that allows certain traders to make judgements about a firm's performance that are superior to the judgements of other traders. As a result, there may be more information asymmetry at the time of an announcement than in no announcement periods. More information asymmetry implies that bid–ask spreads increase, suggesting that market liquidity decreases at the time of a split announcement. Furthermore, informed opinions resulting from public disclosure may lead to an increase in trading volume, despite the reduction in liquidity that accompanies announcements. Studies also find that changes in liquidity can significantly explain the short-term abnormal returns surrounding both the split announcement and the ex-dates.

The market structure and different data in local market from the developed market may yield parallel result. Institutional arrangements in stock market influence investor behaviour and the Kenya NSE data could validate the findings in some of these studies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter set out the research methodology used and identifies the study population and the characteristics of the sample. The research design, data source and collection procedures are succinctly described and the data analysis tools and presentation of the data results.

3.2. Research Design

In this study we use event study method to estimate abnormal returns and make inferences, because the events occur over various dates, and they can be considered as independent. The study establishes causality and the trading activities around the event dates. There are two estimation windows, observation made before the split and after the split; results are compared to ascertain if any change was aroused with announcement, based on Brown and Warner, 1985 study, the effect of non-normality in daily return data; tests performance using samples of selected securities. The study sought to examine the effect of stock splits on stock returns and stock prices at the eventful date. The fundamental assumption is that the market is efficient and prices reflect all new information in the market for future profitability.

3.3. Population

The study population comprise of the 54 companies listed on the NSE, beginning 2004 to mid of 2011. The period under consideration is when we had stock splits and the data is readily available for all the selected firms.

3.4. Sample population

The sample had to meet the following parameters; that is the daily trading results for 60 days for a period around announcement and execution date. The period range, pre split (-60,-30) and post split (+30, +60) days, the execution date is day '0' zero. The sample technique is basically non-probability, since the entire sample population that conducted stock split qualified to be selected.

3.3. Data Collection

The source of data is secondary; obtained from the Nairobi Stock Exchange handbooks; for all the companies that did split stock from 2004 to 2011 was used in this study. The year in which the government announced any policy or introduced new regulatory framework the sample was not considered.

3.4. Data Analysis

The data presentation is by graphs, the study determine 60 days daily returns around announcement and execution date. The challenge is to ascertain whether the variables during pre-split and post- event period are significantly different and measure profitability in terms of abnormal returns around the announcement and execution date. The focus is on short term returns, long-term profitability may be affected by the noise of other market factors a long side stock split.

Liquidity is a reason for stock split to ensure that stock is easier to be traded and trading volume data that is publicly available is used to measure liquidity. The trading volume would move different than before split and the trade volume is dependent to split factor.

3.4.1. Returns Computation

To measure the effect of an observed event on the firm's stock value, under the assumptions of specific return generating model(RGM), that provide the empirical evidence that shows whether a stock performance is statistically different from what would be expected. MacKinlay (1997) indicates, "The usefulness of such a study comes from the fact that, assuming rationality in the market place, the effect of an event will be reflected immediately in assets prices." If the event conveys new relevant information to the stock market, the mean or the variance of the security abnormal returns must reflect the new economic conditions.

Wulff (2002) examined the Germany stock splits by applying the event study methodology described below estimating daily returns. Mishra (2007) in study of Indian Stock market to test for significance of abnormal returns applied the event study methodology. Thus, for firm i and event date t the conditional abnormal return is given by;

$$(1) \quad AR_{it} = R_{it} - E(R_{it} / \Omega_{t-1})$$

Where AR_{it} , R_{it} and $E(R_{it} / \Omega_{t-1})$ are the abnormal, actual and normal (expected) return for time t , respectively. Ω_t is the conditional information set in period t and that the approach followed for the event study methodology assumes that securities returns are generated by some RGM.

To generates normal returns before abnormal returns is based on simple statistical relationships such as the Market Model and Daily stock returns $R_{it} = (P_{it} - P_{it-1} + D_{it}) / P_{it-1}$

A. Market Model

$$(2) \quad AR_{it} = R_{it} - \hat{\alpha} - \hat{\beta}_j R_{mt}$$

where $\hat{\alpha}$ and $\hat{\beta}$ are OLS values from the estimation period.

B. Market-Adjusted Returns Model

$$(3) \quad AR_{it} = R_{it} - R_{mt}$$

where R_{mt} is the market index return for day t .

C. Mean-Adjusted Returns Model

$$(4) \quad AR_{it} = R_{it} - \bar{R}_i$$

where \bar{R}_i the simple average of security i 's daily returns in the estimation period.

3.4.2. Trading Volume

The measure used to compare liquidity before and after execution of stock splits, is represented by the trading volume obtained over the pre-split [-30 -15] and post-split [+15 +30] periods and averaged for the firms. The company average turnover per trade, computed as the ratio of trading volume to the outstanding shares trades is reported for both periods.

The study examined the measures of trading activity for pre- and post-split windows, and trade volumes observed for a significant increase in the average post-split daily number of trades across all split stocks, and test the average daily trading volume whether remained statistically unchanged. A similar methodology was applied by Menendez and Gomez-Anson (2003) and observed an increase in trading volume during the post-split period, hence providing support for the liquidity hypothesis of stock splits.

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSION

4.1. Introduction

This chapter present stock market reaction to announcements of stock splits of companies quoted at the Nairobi Stock Exchange (NSE). The analysis also looks at the speed at which the information concerning stock splits is reflected in the stock price. Average abnormal return grouped per day trading and for the overall period of time 2004 to 2011 is also presented. Trendlines of the abnormal returns of the split stocks before and after announcement, and trendlines of share volume traded within the period are also presented.

4.2 Stock Splits Conducted in Kenya

The study presented the splits that have been done in the Kenyan stock market in Table 1, and by mid 2011, 13 stock splits had already been conducted.

Table 1: Stock Split Size

	Number of Stock Splits	Split Size					Average Split Size
		10:1	8:1	5:1	4:1	2:1	
2004	2	1		1			7.5
2005	0						0
2006	2	1		1			7.5
2007	4	3		1			7.5
2008	1					1	2
2009	1	1					10
2010	2	1	1				8
2011	1				1		4
Total	13	7	1	3	1	1	7.62

Table 1 show that of all the stock splits conducted between 2004 and 2011, the highest split size was 10:1 with the lowest being 2:1, four stock splits were conducted in 2007. In 2005, however, no stock split was conducted.

To analyze whether there was a relationship between frequency of stock splits and market performance (whether bullish or bearish), a trendline of NSE-20 Share index was produced and compared with figure .1.

Figure 1: NSE 20 Share Index Curve

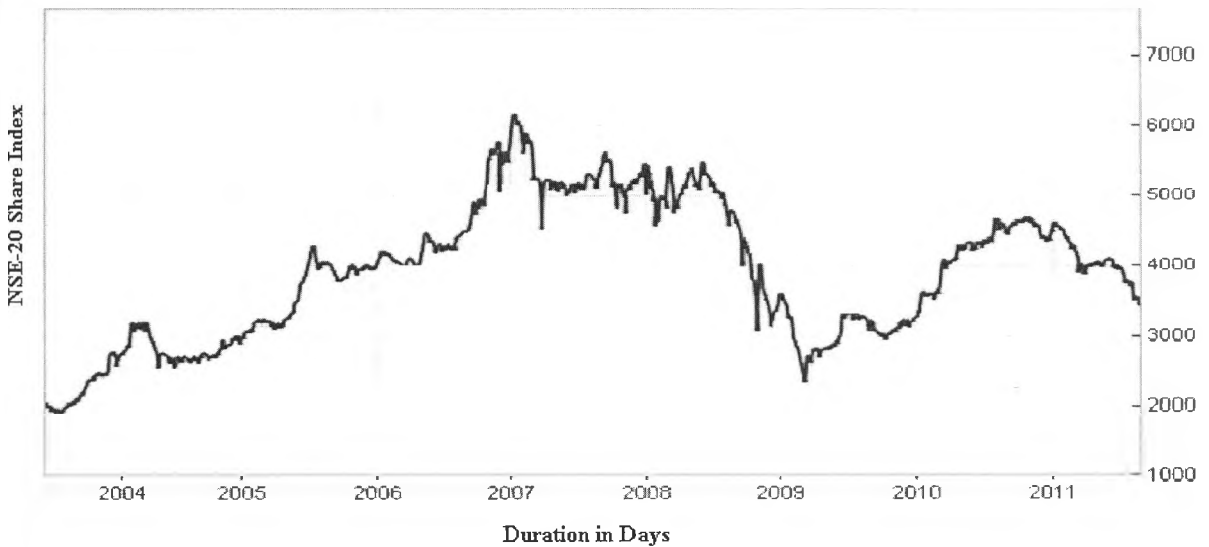


Figure.1 show that there was generally high performance of stocks (bullish) from mid of 2004 to beginning of 2007, with the peak being towards the_end of 2007. This signifies an increase in companies' share prices. In 2004 there were 2 share splits announcement while in 2007 there were 4 share splits announced between August and December. This depicts that stock splits are prevalent during bullish times.

The stock market performance was rather constant in between 2007 and early 2008 before taking a dip to early 2009. This owes to the global financial crisis that took place within the period. In 2010, there were 2 stock split announcements in January and March, which fell with the period when the market was bullish. In 2008, although one stock split was conducted, the split size was

2:1, unlike the early split ratios which were either 10:1 or 5:1. This could have arisen due to the market poor performance during the year. However, towards the third quarter of 2009, the NSE-20 share index exhibited an increase all till towards the end of 2010. In 2010, there were two stock splits conducted in May and October. This was the period when the stock market was still bullish. In 2011, Barclay Bank of Kenya's stock split was announced in February when the stock prices were still high. Since the market performance was declining, the split ratio was 4:1. This is indicative of the fact that stock splits are done when the market performs good.

4.3 Abnormal Returns

The study conducted descriptive analysis of the abnormal returns. Abnormal returns were calculated by determining the difference between the market return (NSE-20 share) and the specific share return. This was aimed at establishing the performance of split stocks relative to that of the market performance.

Table .2: Abnormal Returns

	Mean	STDEV	AR at t0	Min	Max (4 th Quart)	1 st Quartile (Quart)	2 nd Quart (Median)	3 rd Quart
Kenya Oil	0.0062	0.0468	0.0022	-0.0734	0.3004	-0.0053	0.0019	0.0087
EABL	0.0001	0.0227	0.0450	-0.0904	0.1000	-0.0038	0.0000	0.0072
EAC	0.0144	0.0616	0.1954	-0.1160	0.1983	-0.0038	0.0052	0.0362
ICDC	0.0077	0.0787	-0.0953	-0.1086	0.4095	-0.0342	-0.0032	0.0340
BBK	-0.0049	0.1008	-0.2906	-0.2906	0.4106	-0.0614	0.0073	0.0497
Sasini Tea Ltd	-0.0004	0.0768	0.1659	-0.3975	0.1659	-0.0287	0.0068	0.0248
CMC	0.0011	0.0477	0.0727	-0.2646	0.0898	-0.0206	0.0050	0.0183
KCB	0.0025	0.0384	-0.0005	-0.0714	0.1267	-0.0155	-0.0029	0.0179
NMG	0.0041	0.0733	0.0260	-0.1035	0.5348	-0.0103	-0.0012	0.0098
Equity Bank Ltd	-0.0003	0.0437	0.0235	-0.0972	0.1377	-0.0222	0.0023	0.0188
Kenol/Kobil	0.0035	0.0292	-0.0001	-0.0828	0.0801	-0.0129	0.0031	0.0187
KPLC	-0.0008	0.0270	0.0237	-0.1226	0.0716	-0.0104	-0.0015	0.0139
Barclays Bank	0.0030	0.0168	0.0933	-0.0238	0.0933	-0.0069	0.0023	0.0078

Table 2 above presents the data on the abnormal returns of the split shares using market model. From the mean it can be concluded that on average, 9 out of the 13 stock splits done in Kenya had on average positive abnormal returns. This depicts that on overall, split shares performed above the market. The study also looked at the abnormal returns on the announcement date and established that the market reacted positively to 9 of the 13 stocks stock splits as shown by positive abnormal returns on the announcement day. The findings also show that there were positive abnormal returns on stocks of most of the company as shown by the second quartile data. That is, at least half of all the trading days of the 9 of the 13 stock splits had positive AR values since the second quartile (median) value of AR was positive.

Table.3: Market Reaction across the Event Period

Estimation Period	Mean	STDEV
From day -15 to day +15	0.002	1.567
From day -15 to day -1	0.010	1.379
From day +1 to day +15	-0.008	0.873
From day 0 to day +15	-0.006	1.192
Day 0	0.030	0
From day 0 to day +1	0.000	2.719
From day -1 to day 1	0.013	0.0382
Form day -3 to day +3	0.008	1.888
From day -7 to day +7	0.004	1.489

The study further analyzed the data with regards to time intervals within the event window. As illustrated by the table above, average AR for t_{-15} to t_{+15} was 0.002 indicating that on average, the stock splits did not exhibit a wide above normal returns within 15 days pre and post-split announcement. While the average AR for t_{-15} to t_{-1} 0.010, the average AR for t_{+1} to t_{+15} time period was -0.008 signifying that investors did not benefit from trading on stock split announcements during post split as they did during pre-split announcement. The average AR for t_0 to t_{+1} was 0.000, t_{-1} to t_{+1} was 0.013 and t_{-3} to t_{+3} was 0.008. This indicates that the information

was quickly absorbed into the market prices with the first day after announcement with investors not benefitting from stock split information on average. The cancelling effect of returns was also great between the third days pre-and post-split than was in the first day pre and post-split announcement. Table 3 shows that t_{+0} and t_{15} had an average AR value of -0.006. The table also shows that those who traded on t_0 had AR value of 0.03 signifying that the split share did not trade way above the market returns.

4.4 Average Abnormal Return

The data on the average abnormal return across the 8 year period (2004 – 2011) is presented in Figure 2 and Table 2.

Figure 2: Average Abnormal Return

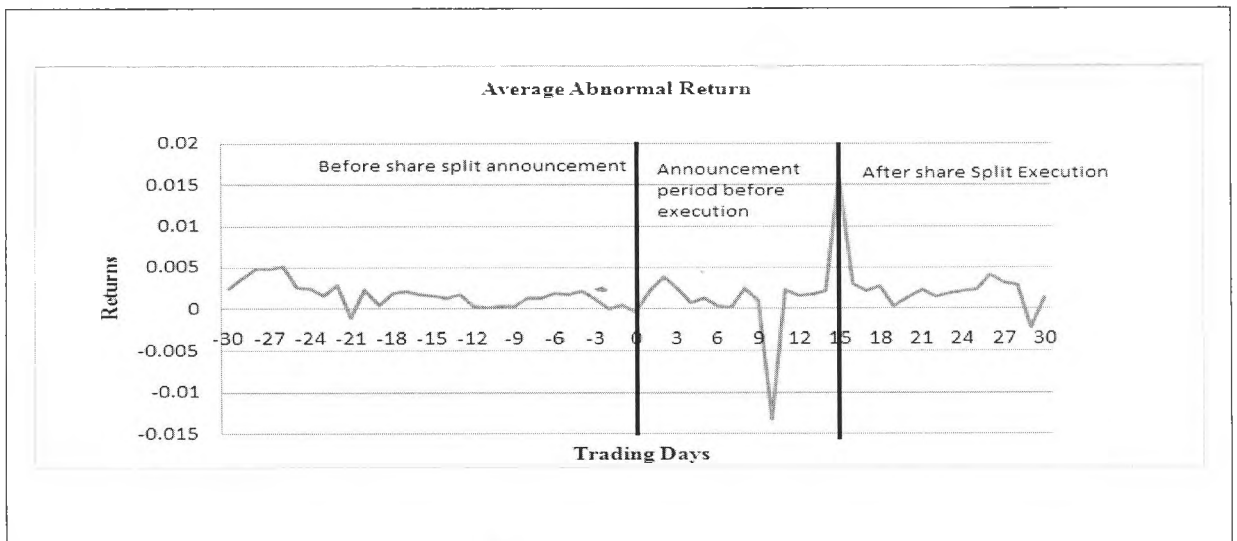


Figure 2 indicates that pre-split share performance were above the market returns with the abnormality in return rising from days $(-t_7)$ to announcement date. However, after announcement, the abnormality increased to (t_9) and the return dipped (split shares performed below the entire market performance). The situation changed just days before the trading of the

split shares. A day after stock split execution date (t_{14}), abnormality in return was recorded before dropping drastically. This could be attributed to price adjustment to match with the split factor. T-significance was used to test whether the abnormality in return was statistically different from 0 at 95% confidence level.

Table 4: Test of significance at the announcement and execution date of stock split

		t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Announcement	Pre	5.172	20	.000	.01333	.0080	.0187
	Post	1.657	20	.113	.02228	-.0058	.0503
Execution	Pre	.542	13	.597	.00775	-.0231	.0386
	Post	4.912	14	.000	.02436	.0137	.0350

Table 4 statistical test indicate that days tending to announcement date of stock split results are significant compared to post announcement date less significant. The execution date results show significant abnormal returns two days after split. Thus reject the hypothesis stating $H_0: AR = 0$. The results are similar to many findings few which are research by Ikenberry et al (1996) and Pavabutr and Sirodom (2008). An exception at pre- announcement where abnormal return are found and significant may happen due to insider trading; Kyle (1985) suggested the insider makers' makes positive profits

4.5 Cumulative Abnormal Return

The average abnormal return for the market was calculated and presented in Figure .3. The Figure below shows that constantly trading in stock splits had a positive cumulative abnormal returns especially towards stock split announcement. This shows that some investors could be using insider information to hold back shares or demand for the specific shares. However, immediately

after stock split announcement, the cumulative return gained started to drop till t_{14} when it gradually gained before dropping again after t_{26} .

Figure 3: Cumulative Average Abnormal Return

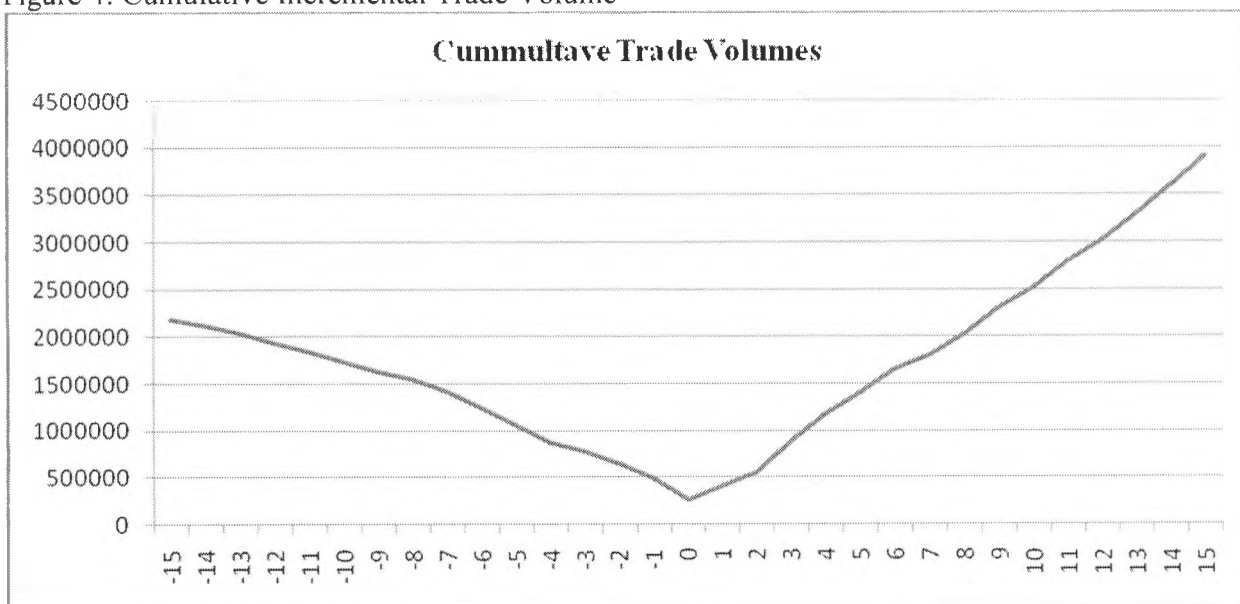


4.6 Resultant Stock Volume Trading Following Split

The study sought to establish how stock volume trading is affected by stock splits both after split execution. Trendline of the volume of shares sold before split (t_{-15} to t_{-1}) and after split execution (t_{16} to t_{30}) was drawn.

Study by Simbovo (2006) and Lamourex and Poon(1987) find similar result; trade volume change of individual companies at the date of stock split. The price are attractive to small investors and tend to flock to market and buy. Dhar at al (2004) note that institutional investors are not attracted to lower split factor and their numbers diminish.

Figure 4: Cumulative Incremental Trade Volume



From the result shown in the figure above on cumulative average trade volume the study found that there was a continuous decrease in the trading volumes from -15 day to the event date, then there was continuous increase from event date up to the 15 date, this in an indication that stock split had positive effects on the trade volumes as it led to increase in the trading volumes after the split date.

Table 5: Test of significance for trading volume before and after stock split.

							95% Confidence Interval of the Difference	
	t	df	P-values			Mean Difference	Lower	Upper
EAC	4.410	13	.001	S	I	6.29706E5	321249.1158	938163.4556
ICDCI	4.762	13	.000	S	I	5.60788E5	306381.1748	815194.1109
EABL	10.685	13	.000	S	I	5.51007E5	439604.2890	662409.9967
Centum	1.210	13	.248	NS	I	35948.28571	-28218.1074	100114.6788
Sasini	-1.089	13	.296	NS	D	-68827.00000	-205346.3003	67692.3003
KPLC	1.389	13	.188	NS	I	60024.28571	-33314.3755	153362.9469
CMC	-4.375	13	.001	S	D	-44674.21429	-66734.1009	-22614.3277
Barclays	-1.665	13	.120	NS	D	-97452.50000	-223905.0845	29000.0845
NMG	-3.718	13	.003	S	D	-41777.21429	-66053.8474	-17500.5812

KCB	1.083	13	.299	NS	I	50855.00000	-50630.2301	152340.2301
Equity	-.572	13	.577	NS	D	-27586.85714	-131856.0297	76682.3154
Kenol	3.333	13	.005	S	I	10721.35714	3772.4770	17670.2373
Barclays	1.389	13	.188	NS	I	60024.28571	-33314.3755	153362.9469

S – significant , NS- Not significant, D- Decrease, I- Increase

The companies that did stock split between the period as much as 8 (eight) had increase in volume trade , while 5(five) had decrease in volume. The increases were significant in 4 (four) companies and not significant decrease. The decrease in trade volume was significant in 2 (two) and 3 (three) companies less significant. The findings, therefore, are 61.5% of the sample having increase in volume after stock split, 50% of which are statistically significant. Whereas 38.5% of sample having decrease 23% had less significant decrease.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the summary of the finding in chapter four. Conclusion and recommendations drawn from these findings are discussed in relation to the objectives of the study which was to establish the Nairobi Stock Exchange reaction to stock split announcements and execution.

5.2 Summary of Findings

The study found that stock split announcements, which were first conducted in 2004, were more prevalent in 2006. The same year was characterized by high performance in the stock market as indicated by the NSE-20 Share Index; general rise in share prices. The high performance of stock market was carried through to 2007 which was also characterized by high split size; 10:1 for the two companies. This coupled by the fact that the stock split size was the lowest in 2008 when the market performance was low (bearish market), is indicative of the fact that the stock splits thrive when the market performs well.

The study established that on average, stock splits exhibited positive returns as depicted by the positive average abnormal returns of 9 of the 13 companies that had conducted stock splits with at least half of all the trading days considered by the study exhibiting positive abnormal returns. On average, the stock split announcement brought about positive returns. On the announcement date the information was absorbed efficiently in the market ($p=0.044$). This signifies that the investors do not benefit by trading on the announcement date. However, after announcement, the

shares traded at negative returns. This could have been induced by other information like merger between Kenya Oil Company Ltd and Kobil Ltd in 2010 and rights issue in case of KPLC in 2010. However, after split execution, the share traded at marginal abnormal returns though at insignificant level ($p > 0.05$). However, the abnormal return was high a day after split execution owing to price adjustment to the split size and retail investors who feel the stock is fairly priced. Using cumulative abnormal returns, the shares return before announcement was a constant owing to return gain and loss till ten days to announcement when abnormal returns rose sharply with its peak being on the announcement date before declining gradually. The cumulative returns rose again a day after execution before declining gradually but steadily. On average, the study established that the volume of share traded was erratic days before the announcement increasing during announcement. This point to the investors holding back their shares as they wait for the split execution so as to gain from share multiplicity.

5.3 Conclusion

The study concludes that the period before announcements exhibit positive returns which is marginally above the market returns. However, on the announcement date, the abnormal return is 0.03. Thus, the information is absorbed the market on the announcement day. However, after announcement, the abnormality in returns becomes negative for most of the days with the investors benefitting on some days from positive returns. It can be concluded that the information concerning stock split is reflected immediately in the stock share prices of the affected shares. The investors then looks for other information to gain from as the split shares exhibit negative returns relative to the market.

It is also concluded that there are habits of insider trading as evidenced by abnormal trading days before the announcement. Investors, following stock split announcement, reacts by holding on to their shares, anticipating benefits from the split.

5.4 Recommendations

It is recommended that investors should not anticipate to benefit from stock split information as such information is available in the market. Trading on information related to stock split results in negative returns relative to the market return. It is also recommended that Capital Market Authority should act on instances on insider trading which is unlawful as well as being unfair. This recommendation is drawn owing abnormal trading days before split announcement.

5.5 Limitations of the Study

The announcements of stock splits results may have been affected by other market anomalies such as the weekend and Monday effect and not necessarily the announcement which were normally done on Fridays or Mondays.

The reaction could also have arisen owing to other information other than stock splits; these could include rights issues in case of KPLC in 2010 or merger and acquisition that affected Kenol/Kobil Ltd in 2010.

The interest rates in fixed incomes and general global market recession of 2009 and other information might have included annual returns. The Government offer of infrastructural bond through NSE provided alternative avenue of investment.

5.6 Areas for Further Studies

The study suggests that, a similar study could be done on market reaction to other corporate events like rights issue, dividend announcement, bonus issues or merger and acquisition.

It is also recommended that strong-form efficiency as it was evident that there were instances on abnormal trading activities prior to announcement.

The effect of split on intuitional investors and split factor is an area that requires exploring and assesses the impact the split has on categories of investors.

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APPENDICES

NSE Listed Companies

Eaagads Ltd Ord 1.25	Pan Africa Insurance Holdings Ltd Ord 5.00
Kapchorua Tea Co. Ltd Ord Ord 5.00	Kenya Re-Insurance Corporation Ltd Ord
Kakuzi Ord.5.00	2.50
Limuru Tea Co. Ltd Ord 20.00	CFC Insurance Holdings
Rea Vipingo Plantations Ltd Ord 5.00	British-American Investments Company (
Sasini Ltd Ord 1.00	Kenya) Ltd Ord 0.10
Williamson Tea Kenya Ltd Ord 5.00	City Trust Ltd Ord 5.00
Express Ltd Ord 5.00	Olympia Capital Holdings ltd Ord 5.00
Kenya Airways Ltd Ord 5.00	Centum Investment Co Ltd Ord 0.50
Nation Media Group Ord. 2.50	B.O.C Kenya Ltd Ord 5.00
Standard Group Ltd Ord 5.00	British American Tobacco Kenya Ltd Ord
TPS Eastern Africa (Serena) Ltd Ord 1.00	10.00
Scangroup Ltd Ord 1.00	Carbacid Investments Ltd Ord 5.00
Hutchings Biemer Ltd Ord 5.00	East African Breweries Ltd Ord 2.00
AccessKenya Group Ltd Ord. 1.00	Mumias Sugar Co. Ltd Ord 2.00
Safaricom Ltd Ord 0.05	Unga Group Ltd Ord 5.00
Car and General (K) Ltd Ord 5.00	Eveready East Africa Ltd Ord.1.00
CMC Holdings Ltd Ord 0.50	Kenya Orchards Ltd Ord 5.00
Sameer Africa Ltd Ord 5.00	A.Baumann CO Ltd Ord 5.00
Marshalls (E.A.) Ltd Ord 5.00	Athi River Mining Ord 5.00
Barelays Bank Ltd Ord 2.00	Bamburi Cement Ltd Ord 5.00
CFC Stanbic Holdings Ltd ord.5.00	Crown Berger Ltd Ord 5.00
Diamond Trust Bank Kenya Ltd Ord 4.00	E.A.Cables Ltd Ord 0.50
Housing Finance Co Ltd Ord 5.00	E.A.Portland Cement Ltd Ord 5.00
Kenya Commercial Bank Ltd Ord 1.00	KenolKobil Ltd Ord 0.05
National Bank of Kenya Ltd Ord 5.00	Total Kenya Ltd Ord 5.00
NIC Bank Ltd Ord 5.00	KenGen Ltd Ord. 2.50
Standard Chartered Bank Ltd Ord 5.00	Kenya Power & Lighting Co Ltd

Equity Bank Ltd Ord 0.50	
The Co-operative Bank of Kenya Ltd Ord 1.00	
Jubilee Holdings Ltd Ord 5.00	

Firms that split stock (2004-2011)

Company	Split Ratio	Date
Kenya Oil Company (KENOL)	10 to 1	5 th July 2004
East African Breweries Limited	10 to 1	29 th November 2004
Barclays Bank (K) Ltd.	5 to 1	29 th November 2006
CMC Holding Limited	10 to 1	29 th February 2007
East African Cables Ltd.	10 to 1	4 th September 2006
Centum Investment Limited	10 to 1	4 th January 2007
Kenya Commercial Bank Limited	10 to 1	2 nd April 2007
Sasini Tea and Coffee	5 to 1	14 th February 2007
Nation Media Group	2 to 1	4 th August 2008
Equity Bank Ltd	10 to 1	12 th February 2009
Kenol/Kobil	10 to 1	20 th may 2010
KPLC	8 to 1	7 th October 2009
Barclays	4 to 1	22 nd February 2011

Daily returns

	KOC	EABL	ECABLES	ICDCI	BBK	SASINI	CMC	KCB	NMG	KKOBIL	CENTUM	BBK	EQUITY
-58	-0.0040	0.0017	-0.0022	0.0029	0.0020	0.0008	0.0074	0.0021	0.0004	0.0040	0.0044	0.0062	0.0011
-57	-0.0040	0.0003	-0.0018	0.0029	0.0020	0.0013	0.0080	0.0011	0.0008	0.0039	0.0004	0.0030	0.0014
-56	-0.0040	0.0043	-0.0022	0.0028	0.0003	0.0009	0.0078	0.0050	0.0012	0.0036	0.0036	0.0041	0.0006
-55	-0.0040	-0.0003	-0.0020	0.0032	0.0020	0.0010	0.0090	0.0010	0.0012	0.0041	0.0020	-0.0025	0.0035
-54	-0.0149	0.0023	-0.0021	0.0028	0.0012	0.0010	0.0076	0.0001	-0.0061	0.0041	0.0028	0.0051	0.0006
-53	-0.0040	0.0153	-0.0020	0.0030	-0.0047	0.0009	0.0082	-0.0009	0.0000	0.0040	0.0020	0.0019	0.0018
-52	-0.0040	0.0041	-0.0020	0.0030	0.0012	0.0009	0.0080	0.0010	-0.0040	0.0041	0.0020	0.0030	0.0023
-51	-0.0040	0.0059	-0.0019	0.0030	0.0020	0.0010	0.0090	-0.0019	0.0021	0.0039	0.0012	-0.0023	0.0017

-50	-0.0040	0.0010	-0.0018	0.0030	0.0020	0.0009	0.0100	0.0030	0.0057	0.0040	0.0004	-0.0082	0.0020
-49	-0.0040	-0.0002	-0.0021	0.0031	0.0020	0.0003	0.0082	-0.0009	0.0008	0.0037	0.0028	0.0021	0.0026
-48	-0.0040	0.0016	-0.0021	0.0030	0.0012	0.0015	0.0073	0.0001	-0.0004	0.0039	0.0028	0.0067	0.0023
-47	-0.0058	-0.0038	-0.0020	0.0030	0.0020	0.0009	0.0082	0.0078	0.0000	0.0035	0.0020	0.0020	0.0020
-46	-0.0040	0.0022	-0.0018	0.0031	0.0020	0.0009	0.0066	0.0131	-0.0023	0.0037	0.0004	0.0106	0.0029
-45	-0.0040	0.0022	-0.0020	0.0030	0.0052	0.0007	0.0091	-0.1910	0.0004	0.0037	0.0020	-0.0030	0.0017
-44	-0.0040	0.0004	-0.0021	0.0032	0.0020	0.0014	0.0084	0.0209	0.0020	0.0036	0.0028	0.0011	0.0033
-43	-0.0040	0.0016	-0.0021	0.0030	0.0020	0.0006	0.0087	0.0001	-0.0004	0.0039	0.0028	-0.0008	0.0023
-42	-0.0034	0.0010	-0.0006	0.0030	-0.0005	0.0009	0.0088	-0.0021	0.0000	0.0042	-0.0119	-0.0016	0.0017
-41	-0.0040	0.0010	-0.0023	0.0030	0.0020	0.0012	0.0085	0.0022	-0.0016	0.0045	0.0049	0.0003	0.0021
-40	-0.0040	0.0010	-0.0022	0.0030	0.0004	0.0007	0.0104	-0.0021	0.0000	0.0036	0.0035	-0.0100	0.0023
-39	-0.0046	0.0004	-0.0021	0.0030	-0.0004	0.0009	0.0077	0.0022	-0.0032	0.0046	0.0028	0.0046	0.0017
-38	-0.0040	0.0010	-0.0019	0.0031	-0.0131	0.0001	0.0083	0.0043	0.0012	0.0037	0.0012	0.0014	0.0028
-37	-0.0040	0.0016	-0.0019	0.0030	0.0118	0.0012	0.0083	-0.0041	-0.0020	0.0038	0.0012	0.0014	0.0021
-36	-0.0058	0.0010	-0.0026	0.0031	0.0004	0.0005	0.0083	-0.0042	-0.0025	0.0040	0.0081	0.0014	0.0026
-35	-0.0040	0.0010	-0.0022	0.0030	-0.0003	0.0006	0.0079	-0.0042	-0.0033	0.0040	0.0036	0.0038	0.0019
-34	-0.0040	0.0004	-0.0021	0.0030	-0.0057	-0.0002	0.0080	0.0089	0.0004	0.0040	0.0028	0.0030	0.0021
-33	0.0034	0.0016	-0.0021	0.0030	-0.0040	0.0008	0.0079	-0.0084	-0.0013	0.0035	0.0028	0.0038	0.0023
-32	-0.0010	0.0010	-0.0019	0.0030	0.0042	0.0016	0.0083	0.0067	-0.0004	0.0042	0.0012	0.0014	0.0021
-31	-0.0040	0.0010	-0.0020	0.0032	0.0079	0.0011	0.0074	-0.0063	0.0000	0.0038	0.0020	0.0061	0.0031
-30	-0.0005	0.0040	-0.0019	0.0030	0.0110	0.0013	0.0086	0.0001	-0.0013	0.0040	0.0012	-0.0002	0.0021
-29	-0.0005	-0.0002	-0.0022	0.0031	-0.0050	0.0012	0.0080	0.0001	0.0039	0.0037	0.0036	0.0030	0.0025
-28	-0.0040	0.0016	-0.0019	0.0033	0.0020	0.0019	0.0077	0.0089	0.0034	0.0037	0.0012	0.0045	0.0039
-27	-0.0012	0.0010	-0.0021	0.0033	-0.0003	0.0001	0.0080	0.0001	-0.0004	0.0045	0.0028	0.0030	0.0039
-26	-0.0062	0.0010	-0.0022	0.0033	-0.0063	0.0011	0.0080	0.0001	-0.0004	0.0043	0.0036	0.0030	0.0040
-25	-0.0046	0.0016	-0.0018	0.0033	0.0107	0.0015	0.0079	0.0001	0.0025	0.0035	0.0003	0.0038	0.0041
-24	-0.0051	0.0010	-0.0021	0.0033	0.0035	0.0010	0.0079	0.0064	0.0004	0.0038	0.0028	0.0038	0.0040
-23	-0.0040	0.0034	-0.0019	0.0027	-0.0003	0.0009	0.0076	0.0001	0.0012	0.0043	0.0012	0.0054	0.0001
-22	-0.0074	0.0040	-0.0021	0.0028	-0.0063	0.0009	0.0090	0.0001	-0.0012	0.0038	0.0028	0.0303	0.0006
-21	-0.0040	0.0028	-0.0021	0.0029	0.0020	0.0004	0.0069	0.0001	-0.0004	0.0041	0.0028	-0.0308	0.0013
-20	-0.0040	0.0039	-0.0021	0.0030	0.0042	0.0011	0.0074	0.0001	-0.0004	0.0038	0.0028	0.0062	0.0022
-19	-0.0081	0.0004	-0.0020	0.0030	0.0005	0.0008	0.0080	-0.0081	-0.0004	0.0040	0.0020	0.0030	0.0020
-18	-0.0070	0.0091	-0.0021	0.0031	0.0013	0.0012	0.0077	-0.0021	-0.0008	0.0037	0.0028	0.0047	0.0024
-17	-0.0004	0.0010	-0.0021	0.0032	0.0013	0.0008	0.0083	0.0022	0.0008	0.0036	0.0028	0.0013	0.0035
-16	0.0019	0.0010	-0.0017	0.0031	0.0027	0.0007	0.0082	0.0001	-0.0008	0.0037	-0.0014	0.0022	0.0026
-15	-0.0006	0.0004	-0.0019	0.0033	-0.0053	0.0012	0.0077	0.0001	0.0000	0.0043	0.0012	0.0046	0.0040
-14	-0.0017	0.0010	-0.0015	0.0031	-0.0008	0.0012	0.0078	-0.0021	0.0008	0.0038	-0.0029	0.0038	0.0029
-13	-0.0040	-0.0007	-0.0019	0.0031	0.0006	0.0009	0.0082	0.0001	0.0062	0.0040	0.0012	0.0022	0.0025
-12	-0.0040	0.0050	-0.0022	0.0030	-0.0223	0.0017	0.0082	0.0001	0.0008	0.0040	0.0043	0.0022	0.0023

-11	-0.0040	0.0021	-0.0016	0.0031	-0.0220	0.0008	0.0083	0.0001	0.0047	0.0040	-0.0020	0.0013	0.0028
-10	0.0072	0.0038	-0.0018	0.0031	-0.0222	0.0009	0.0093	-0.0021	0.0034	0.0031	-0.0003	-0.0044	0.0028
-9	-0.0003	0.0048	-0.0015	0.0029	-0.0059	0.0008	0.0098	-0.0043	0.0018	0.0036	-0.0033	-0.0070	0.0016
-8	-0.0040	-0.0001	-0.0019	0.0031	0.0111	0.0009	0.0093	-0.0022	-0.0029	0.0030	0.0005	-0.0042	0.0026
-7	-0.0004	0.0005	-0.0026	0.0029	0.0057	0.0006	0.0101	-0.0044	0.0000	0.0038	0.0078	-0.0085	0.0013
-6	-0.0004	0.0015	-0.0018	0.0030	0.0090	0.0012	0.0099	0.0024	-0.0004	0.0051	-0.0003	-0.0076	0.0020
-5	-0.0040	0.0005	-0.0021	0.0029	0.0097	0.0015	0.0086	-0.0022	-0.0015	0.0043	0.0035	-0.0004	0.0014
-4	-0.0040	0.0010	-0.0018	0.0033	0.0140	0.0005	0.0092	0.0024	-0.0007	0.0035	0.0005	-0.0037	0.0040
-3	0.0015	0.0015	-0.0019	0.0033	-0.0112	0.0014	0.0088	0.0046	-0.0011	0.0034	0.0013	-0.0012	0.0041
-2	-0.0035	0.0037	-0.0020	0.0042	-0.0025	0.0011	0.0097	-0.0199	-0.0015	0.0033	0.0020	-0.0062	0.0107
-1	-0.0006	0.0005	-0.0020	0.0027	-0.0220	0.0009	0.0100	0.0172	0.0000	0.0042	0.0020	-0.0080	-0.0001
0	-0.0040	0.0145	-0.0020	0.0027	-0.0580	0.0008	0.0030	0.0001	0.0012	0.0040	0.0020	0.0307	0.0001
1	-0.0045	-0.0057	-0.0019	0.0027	0.0126	0.0011	0.0067	0.0023	0.0000	0.0037	0.0013	0.0103	0.0000
2	-0.0035	0.0005	-0.0021	0.0029	0.0234	0.0011	0.0072	0.0045	-0.0004	0.0046	0.0027	0.0072	0.0016
3	-0.0040	0.0010	-0.0019	0.0030	0.0123	0.0007	0.0074	0.0001	-0.0011	0.0042	0.0013	0.0061	0.0020
4	-0.0030	0.0010	-0.0019	0.0030	-0.0078	0.0010	0.0080	0.0001	-0.0019	0.0041	0.0005	0.0030	0.0022
5	-0.0050	0.0010	-0.0015	0.0031	0.0006	0.0010	0.0077	0.0001	0.0004	0.0042	-0.0031	0.0049	0.0029
6	-0.0040	0.0010	-0.0016	0.0030	-0.0218	0.0009	0.0073	0.0067	0.0012	0.0038	-0.0015	0.0069	0.0022
7	-0.0026	0.0015	-0.0011	0.0029	-0.0069	0.0007	0.0080	-0.0021	-0.0012	0.0039	-0.0068	0.0030	0.0014
8	-0.0040	0.0005	-0.0019	0.0029	0.0020	0.0009	0.0080	0.0022	-0.0004	0.0148	0.0014	0.0030	0.0015
9	-0.0040	0.0010	-0.0014	0.0030	0.0041	0.0006	0.0074	-0.0063	0.0004	0.0040	-0.0037	0.0063	0.0017
10	-0.1789	0.0010	-0.0016	0.0030	0.0078	0.0004	0.0079	-0.0197	0.0000	0.0041	-0.0022	0.0037	0.0019
11	0.0088	0.0005	-0.0020	0.0030	-0.0061	0.0004	0.0084	0.0073	0.0008	0.0040	0.0020	0.0009	0.0018
12	-0.0023	0.0015	-0.0014	0.0029	0.0053	0.0002	0.0075	0.0001	-0.0012	0.0041	-0.0039	0.0057	0.0015
13	-0.0074	0.0010	-0.0018	0.0030	0.0066	0.0006	0.0077	0.0001	0.0004	0.0039	0.0003	0.0044	0.0022
14	-0.0127	0.0005	-0.0022	0.0027	0.0058	0.0011	0.0070	0.0094	-0.0004	0.0041	0.0037	0.0086	0.0002
15	-0.0185	0.0015	-0.0012	0.0030	0.2084	0.0015	0.0080	0.0023	0.0000	0.0044	-0.0059	0.0030	0.0022
16	-0.0099	0.0010	-0.0021	0.0030	0.0154	0.0009	0.0061	0.0023	0.0000	0.0036	0.0025	0.0132	0.0019
17	-0.0050	0.0010	-0.0020	0.0031	0.0105	0.0011	0.0087	0.0023	0.0000	0.0039	0.0020	-0.0010	0.0029
18	-0.0070	0.0010	-0.0022	0.0033	0.0181	0.0017	0.0090	0.0022	0.0000	0.0041	0.0036	-0.0024	0.0038
19	-0.0102	0.0010	-0.0021	0.0029	0.0020	0.0010	0.0087	-0.0064	0.0000	0.0042	0.0025	-0.0007	0.0011
20	-0.0040	0.0010	-0.0020	0.0029	0.0020	0.0012	0.0079	-0.0044	0.0004	0.0039	0.0020	0.0037	0.0016
21	-0.0093	0.0010	-0.0027	0.0030	0.0083	0.0012	0.0073	-0.0022	0.0008	0.0043	0.0085	0.0066	0.0023
22	-0.0040	0.0010	-0.0015	0.0029	0.0004	0.0009	0.0077	0.0024	0.0008	0.0038	-0.0031	0.0045	0.0016
23	-0.0094	0.0031	-0.0018	0.0031	0.0036	0.0015	0.0077	0.0046	0.0008	0.0042	-0.0002	0.0045	0.0025
24	-0.0040	0.0083	-0.0019	0.0029	0.0020	0.0015	0.0080	0.0023	-0.0004	0.0038	0.0015	0.0030	0.0011
25	-0.0062	0.0020	-0.0019	0.0029	0.0084	0.0010	0.0072	0.0023	0.0000	0.0041	0.0009	0.0076	0.0014
26	-0.0006	0.0081	-0.0019	0.0030	0.0202	0.0009	0.0079	0.0044	0.0008	0.0038	0.0009	0.0038	0.0017
27	0.0038	0.0050	-0.0019	0.0030	0.0002	0.0009	0.0084	0.0065	0.0057	0.0043	0.0015	0.0006	0.0023

28	0.0110	0.0010	-0.0017	0.0029	0.0055	0.0009	0.0080	0.0021	0.0000	0.0037	-0.0006	0.0030	0.0013
29	-0.0060	-0.0433	-0.0023	0.0030	0.0038	0.0011	0.0076	0.0001	-0.0015	-0.0048	0.0051	0.0053	0.0019
30	-0.0100	-0.0002	-0.0017	0.0030	0.0038	0.0013	0.0081	0.0021	0.0019	0.0040	-0.0012	0.0022	0.0021
31	-0.0009	0.0004	-0.0018	0.0030	0.0002	0.0009	0.0076	0.0041	0.0007	0.0040	0.0005	0.0054	-0.0063
32	-0.0030	0.0010	0.0000	0.0030	-0.0107	0.0010	-0.0126	0.0021	0.0072	0.0040	0.0035	0.1161	0.0154
33	-0.0050	0.0010	0.0000	0.0030	-0.0169	0.0009	0.0079	0.0040	0.0055	0.0040	-0.0001	0.0034	0.0019
34	-0.0050	0.0010	-0.0018	0.0030	-0.0220	0.0009	0.0083	0.0001	-0.0039	0.0040	0.0005	0.0014	0.0022
35	-0.0061	0.0010	-0.0019	0.0030	-0.0038	0.0010	0.0088	0.0059	-0.0027	0.0040	0.0010	-0.0013	0.0019
36	-0.0030	0.0010	-0.0020	0.0030	-0.0080	0.0010	0.0075	0.0019	-0.0048	0.0040	0.0020	0.0060	0.0020
37	-0.0040	0.0022	-0.0018	0.0030	-0.0062	0.0011	0.0076	0.0019	0.0018	0.0083	-0.0005	0.0049	0.0019
38	-0.0071	0.0004	-0.0020	0.0030	0.0152	0.0010	0.0074	0.0001	0.0004	0.0041	0.0020	0.0065	0.0017
39	-0.0009	0.0016	-0.0020	0.0030	0.0034	0.0009	0.0086	-0.0036	-0.0011	0.0040	0.0015	-0.0002	0.0022
40	-0.0061	0.0010	-0.0018	0.0029	0.0090	0.0011	0.0080	-0.0056	-0.0061	0.0041	0.0001	0.0030	0.0016
41	-0.0050	0.0010	-0.0022	0.0029	0.0078	0.0010	0.0073	-0.0096	-0.0007	0.0049	0.0039	0.0069	0.0014
42	-0.0082	0.0028	-0.0018	0.0029	0.0079	0.0009	0.0089	-0.0020	-0.0023	0.0026	0.0001	-0.0018	0.0016
43	-0.0093	-0.0007	-0.0020	0.0030	0.0035	0.0013	0.0070	0.0021	0.0019	-0.0944	0.0025	0.0084	0.0017
44	-0.0117	0.0086	-0.0020	0.0030	-0.0011	0.0013	0.0082	0.0041	0.0000	0.0148	0.0020	0.0018	0.0023
45	-0.0017	0.0112	-0.0019	0.0003	0.0050	0.0011	0.0072	0.0040	0.0000	0.0028	0.0010	0.0074	-0.0167
46	-0.0063	0.0054	-0.0022	0.0027	0.0051	0.0015	0.0059	0.0001	0.0000	0.0053	0.0039	0.0143	-0.0001
47	-0.0097	0.0015	-0.0019	0.0031	0.0097	0.0024	0.0076	-0.0019	0.0008	0.0025	0.0126	0.0053	0.0028
48	-0.0111	-0.0017	-0.0020	0.0030	0.0036	0.0015	0.0071	-0.0039	0.0004	0.0055	-0.0112	0.0081	0.0018
49	-0.0003	0.0010	-0.0016	0.0028	0.0020	0.0012	0.0076	0.0001	0.0004	0.0038	-0.0018	0.0054	0.0007
50	-0.0028	-0.0006	-0.0024	0.0030	0.0036	0.0003	0.0066	0.0021	0.0004	0.0043	0.0057	0.0104	0.0023
51	-0.0040	0.0015	-0.0019	0.0030	-0.0077	0.0009	0.0073	0.0001	0.0022	0.0037	0.0006	0.0067	0.0022
52	0.0091	0.0010	-0.0017	0.0029	0.0036	0.0008	0.0089	-0.0019	-0.0004	0.0038	-0.0013	-0.0019	0.0012
53	-0.0085	0.0005	-0.0011	0.0030	-0.0011	0.0006	0.0103	0.0001	0.0004	0.0040	-0.0072	-0.0095	0.0020
54	-0.0040	-0.0006	-0.0020	0.0030	0.0020	0.0008	0.0102	0.0001	0.0000	0.0028	0.0016	-0.0089	0.0020
55	-0.0040	-0.0012	-0.0009	0.0030	0.0035	0.0011	0.0088	0.0001	0.0000	0.0051	-0.0087	-0.0013	0.0020
56	0.0017	0.0010	-0.0019	0.0030	0.0051	0.0009	0.0087	0.0001	-0.0004	0.0049	0.0008	-0.0008	0.0018
57	0.0160	0.0016	-0.0019	0.0031	0.0004	0.0008	0.0087	0.0061	0.0018	0.0030	0.0012	-0.0011	0.0024
58	0.0031	0.0027	-0.0020	0.0030	0.0083	0.0010	0.0076	-0.0038	0.0018	0.0028	0.0024	0.0050	0.0023

Average abnormal Return

Da y	2004	2006	2007	2008	2009	2010	2011	AAR	t	Sig. (2- tailed)
-30	0.008	0.050	-0.021	0.010	0.036	0.003	-0.016	0.010	1.026	0.345
-29	0.005	0.025	0.004	-0.002	0.055	0.013	0.007	0.015	2.104	0.080
-28	-0.005	0.024	-0.007	0.028	-0.086	0.019	-0.011	-0.005	-0.369	0.725
-27	0.009	0.016	0.002	0.026	-0.038	-0.025	0.003	-0.001	-0.129	0.901

-26	-0.003	0.018	-0.014	-0.030	-0.029	-0.011	0.002	-0.010	-1.500	0.184
-25	0.002	0.033	0.013	-0.019	0.046	0.017	-0.007	0.012	1.413	0.207
-24	-0.001	0.052	0.001	0.001	0.026	0.008	-0.002	0.012	1.632	0.154
-23	0.009	0.037	-0.003	-0.007	-0.029	-0.015	-0.006	-0.002	-0.240	0.818
-22	0.005	-0.050	-0.018	0.012	0.002	0.018	0.013	-0.003	-0.288	0.783
-21	0.008	-0.040	0.003	-0.004	0.008	0.001	-0.005	-0.004	-0.654	0.538
-20	0.005	-0.012	-0.008	0.002	0.009	0.012	0.001	0.001	0.387	0.712
-19	-0.006	0.022	-0.007	-0.007	0.024	0.011	-0.004	0.005	0.874	0.416
-18	0.000	0.008	0.002	0.001	-0.003	0.043	-0.002	0.007	1.089	0.318
-17	-0.003	0.022	0.002	-0.005	0.017	0.006	0.007	0.006	1.717	0.137
-16	0.008	0.023	0.015	0.005	0.006	-0.005	-0.001	0.007	2.079	0.083
-15	0.004	0.011	0.014	-0.002	-0.021	-0.023	0.016	0.000	-0.066	0.950
-14	-0.008	0.034	0.013	0.010	-0.001	0.018	-0.001	0.009	1.698	0.140
-13	0.002	0.026	-0.007	0.010	-0.004	0.017	-0.005	0.005	1.158	0.291
-12	0.012	0.021	0.032	0.002	0.007	0.017	-0.009	0.012	2.330	0.059
-11	0.002	-0.001	-0.030	-0.008	-0.006	-0.008	-0.016	-0.010	-2.368	0.056
-10	0.036	0.021	0.000	0.013	0.002	0.035	-0.006	0.014	2.219	0.068
-9	0.018	0.016	0.017	0.006	0.001	0.000	0.005	0.009	3.022	0.023
-8	0.000	-0.007	0.027	0.009	-0.006	0.044	0.008	0.011	1.554	0.171
-7	0.003	0.014	0.017	-0.014	-0.037	-0.003	0.008	-0.002	-0.231	0.825
-6	0.004	-0.015	0.031	0.007	0.016	-0.046	0.009	0.001	0.096	0.927
-5	0.001	0.001	0.026	0.018	0.058	-0.016	0.003	0.013	1.438	0.201
-4	0.005	-0.015	0.016	-0.003	0.006	0.028	0.004	0.006	1.107	0.311
-3	0.015	0.052	0.020	0.003	-0.005	0.024	0.011	0.017	2.482	0.048
-2	0.003	0.071	0.076	0.021	-0.001	0.026	0.004	0.028	2.339	0.058
-1	0.008	0.228	0.054	0.002	-0.011	-0.013	0.013	0.040	1.237	0.262
0	0.024	-0.006	0.036	0.026	0.023	0.012	0.093	0.030	2.533	0.044
1	-0.012	-0.073	-0.164	-0.001	-0.895	-0.002	0.007	-0.163	-1.312	0.238
2	0.000	-0.073	-0.029	-0.020	9.077	-0.019	0.007	1.278	0.983	0.364
3	0.003	-0.026	-0.025	-0.003	-0.010	-0.017	0.006	-0.010	-2.122	0.078
4	0.005	-0.023	0.002	0.002	-0.054	0.003	-0.007	-0.010	-1.255	0.256
5	-0.002	0.012	-0.005	-0.012	0.010	-0.002	0.002	0.000	0.132	0.900
6	0.000	0.004	-0.006	-0.001	-0.077	-0.004	-0.018	-0.015	-1.363	0.222
7	0.003	-0.002	-0.017	0.012	0.013	0.004	0.008	0.003	0.779	0.465
8	-0.003	-0.030	0.001	-0.008	0.022	-0.004	0.012	-0.002	-0.244	0.815
9	0.001	-0.020	0.009	-0.003	-0.023	-0.008	-0.001	-0.006	-1.484	0.188
10	0.001	0.003	-0.006	-0.008	0.001	-0.003	0.004	-0.001	-0.807	0.450
11	0.002	-0.018	0.006	-0.012	-0.028	-0.015	0.015	-0.007	-1.246	0.259
12	0.004	-0.008	-0.017	-0.003	-0.051	0.001	0.021	-0.007	-0.881	0.412
13	0.004	0.005	-0.019	-0.013	-0.073	0.007	-0.003	-0.013	-1.259	0.255
14	-0.001	-0.001	-0.022	0.004	0.002	0.002	-0.007	-0.003	-0.980	0.365
15	0.001	0.013	-0.007	-0.008	-0.009	-0.017	-0.010	-0.005	-1.430	0.203
16	-0.045	-0.094	0.021	0.069	0.042	-0.023	0.027	-0.001	-0.030	0.977
17	0.002	0.026	0.009	0.016	0.138	0.010	-0.012	0.027	1.414	0.207
18	0.007	-0.036	-0.039	-0.008	0.014	0.009	-0.012	-0.009	-1.164	0.289
19	0.200	-0.001	0.068	0.535	0.079	0.004	0.050	0.134	1.871	0.111
20	0.038	0.030	0.058	-0.088	0.045	0.024	-0.009	0.014	0.742	0.486

21	-0.011	0.014	0.020	-0.085	0.080	0.004	-0.005	0.003	0.137	0.896
22	-0.031	0.004	0.010	0.013	0.073	-0.032	-0.006	0.004	0.322	0.759
23	-0.055	0.007	-0.010	-0.038	0.017	-0.065	-0.009	-0.022	-1.865	0.111
24	-0.031	-0.001	-0.010	-0.103	0.007	-0.016	-0.017	-0.024	-1.736	0.133
25	-0.017	-0.002	-0.010	-0.067	0.006	-0.008	-0.012	-0.016	-1.753	0.130
26	-0.002	-0.018	0.024	-0.040	0.002	-0.002	0.005	-0.004	-0.580	0.583
27	-0.011	-0.019	-0.007	0.005	0.021	0.034	-0.024	0.000	-0.007	0.995
28	-0.017	-0.061	-0.013	0.035	-0.025	-0.007	0.005	-0.012	-1.046	0.336
29	0.000	0.024	0.007	-0.013	-0.084	-0.020	0.010	-0.011	-0.798	0.455
30	-0.015	-0.023	-0.001	0.026	-0.086	-0.012	0.025	-0.012	-0.867	0.419
31	0.002	-0.057	-0.012	-0.020	-0.097	0.004	0.005	-0.025	-1.719	0.136
32	-0.019	-0.011	-0.006	-0.016	-0.086	-0.003	0.020	-0.017	-1.369	0.220

Daily trade volumes

Day	East cables	ICDCI	EABL	Centum	Sasini	Kenol /kobil	CMC	barclays	NMG	KCB	equity	kOC	barclays
-15	217077	23376	47077	102900	256894	8541	5700	18455	12267	200301	65650	100	8541
-14	39569	15850	39569	107561	122239	58735	42050	64351	5700	222319	118552	0	58735
-13	38009	27630	47630	111674	153404	74141	64823	390858	42050	125265	266950	0	74141
-12	15649	72560	72560	139805	168847	77776	104261	335091	64823	139805	22600	401	77776
-11	35299	105866	85866	176206	211538	47595	135604	188461	104261	176206	50700	916	47595
-10	56728	31245	31245	256894	186120	18455	64413	155959	135604	256894	53200	2346	18455
-9	70068	72650	72650	122239	207777	64351	73758	29146	64413	122239	65900	0	64351
-8	45765	20581	20581	153404	137462	390858	134400	140265	73758	153404	38650	4769	390858
-7	151510	50861	50861	168847	281265	335091	50400	183211	134400	168847	394900	1280	335091
-6	64043	29074	29074	161538	1061616	188461	89390	379196	50400	211538	27080	500	188461
-5	84594	43200	43200	155959	232326	155959	28000	687942	89390	186120	430487	800	155959
-4	103643	108198	108198	129146	196746	29146	56791	162347	28000	207777	63500	1200	29146
-3	61920	190500	190500	140265	274879	140265	55260	272066	56791	137462	43500	0	140265
-2	99649	37971	37971	183211	612418	183211	29075	345556	55260	281265	21500	210	183211
-1	158563	56559	56559	379196	245880	379196	12780	213946	29075	1061616	25700	210	379196
0	36000	244200	244200	687942	112426	687942	120634	173331	12780	232326	173700	0	687942
1	167186	107055	107055	162347	225797	162347	38700	170505	120634	196746	228300	31334	162347
2	54336	213000	213000	272066	59088	272066	14100	142490	38700	274879	104900	38174	272066
3	900448	442025	442025	345556	311364	345556	19600	347660	14100	612418	116500	30732	345556
4	471636	785121	785121	213946	553970	213946	14800	217636	19600	245880	53200	7260	213946
5	345226	805300	805300	173331	183284	173331	6600	111154	14800	112426	54200	11323	173331
6	356142	897200	897200	170505	117306	170505	19300	78655	6600	225797	45100	17832	170505
7	152550	311306	719300	142490	63499	142490	27701	111688	19300	59088	20500	12500	142490

8	198915	246950	727701	347660	173665	347660	91200	95507	27701	311364	62100	18950	347660
9	937585	174531	791200	217636	97775	217636	52900	159274	91200	553970	84100	5300	217636
10	876900	225044	652900	111154	270061	111154	7561	173457	52900	183284	19730	1300	111154
11	1874488	247177	507561	78655	524348	78655	11674	48024	7561	117306	29400	0	78655
12	1430336	320457	411674	111688	67795	111688	2400	55498	11674	63499	88900	2800	111688
13	527449	1368700	612400	95507	73241	95507	17100	147669	2400	173665	404123	0	95507
14	1167700	1098862	517100	159274	445333	159274	8600	140245	17100	97775	134500	3650	159274
15	605700	1544916	508600	173457	199224	173457	14950	159612	8600	270061	59700	12800	173457