EFFECTS OF STOCK Splits ON SECURITIES RETURNS OF COMPANIES LISTED IN NAIROBI STOCK EXCHANGE

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A Management Research Project Submitted in Partial Fulfillment of Requirements for the Degree of Master of Business Administration, School of Business, University of Nairobi

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DECLARATION

This project is my original work and has never been submitted for a degree in any other University.

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I dedicate this work to my sons,

Kevin and Ryan
ACKNOWLEDGEMENT

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ABSTRACT

Stock splits remain one of the most popular and least understood phenomena in equity markets. At the Nairobi Stock Exchange there is insufficient evidence from prior research of the effects of stock splits on the securities returns. This study sought to establish such effects using pure stock splitting firms. These are firms that only announced stock splits and not mixed with those that announced stock dividends.

Prior literature give evidence of event clustering during stock split announcements as firms tend to announce dividends increases alike. To mitigate for possible effect of event clustering on the tests results, control firm approach was employed. This involved selection of a firm which did not perform stock split but with similar characteristics as the sample firm. Such a matching firm was used in place of the sample firm that had simultaneous dividend announcement.

The findings of the tests performed reveal that the stock splits signal to the market. The market interpret stock split as good information as returns are observed to increase significantly around the time of stock split announcement.
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1 INTRODUCTION

1.1 Background

All publicly-traded companies have a set number of shares that are outstanding on the stock market. Outstanding shares are those shares that are currently held by investors. A stock split is a decision by the company's board of directors to increase the number of shares that are outstanding by issuing more shares to current shareholders. Katerina, Dasilas, and Varnas (2006) explains that a stock split results in a reduction of the par value and a proportionate consequent increase in the number of shares proportionate to the split.

Stock splits are similar to stock dividends as they both result into stock distributions to the existing shareholders. However, they sharply differ in the accounting treatment. Accounting principles require that stock dividend distributions will be accompanied by a decrease in firm's balance of retained earnings. A stock dividend is a reduction of distributable equity (or equity that can be distributed to shareholders in terms of cash dividends). This distributable equity includes the balance of retained earnings. Accordingly it is argued, such distribution is made only when managers do not expect the balance of retained earnings to constrain future cash dividend payments. Stock dividend distribution may therefore be perceived as a substitution for relatively low cash dividends. Stock splits on the other hand, do not have any effect on distributable equity. Therefore companies with minimal or accumulated retained earnings may not pay stock dividends but can effect stock split.
1.1.1 Effects of Stock Splits

Many studies in particular those performed in Nairobi Stock Exchange have failed to consider the important distinction between a stock split and a stock dividend. Simbovo (2006) found conflicting results in testing liquidity of stock splits firms compared to stock distributions (bonus issue) firms. Lakonishok and Lev (1987) found that the characteristics of firms engaged in stock dividends distributions are markedly different from those of stock splitting firms and concluded that stock dividends are not just small stock splits. Moreover, splits are preceded by unusually high growth in earnings and dividends. Conroy and Harris (1999) presents that the empirical properties of stock splits also appear to be fundamentally different from those of stock dividends; and argue that it is inappropriate to view stock splits and stock dividends as the same phenomenon executed on different scales. Theoretically, shareholders receive no tangible benefit from a stock split, while there are some costs associated with it. Lamoureux and Poon (1987) argued that splits are at one level only cosmetic change which involve slicing the same pie into smaller pieces without changing an investor’s fractional ownership of the equity interest and votes in the company.

Over the years the relationship between stock splits and stock prices 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. Katerina et al. (2006) argues that the reaction occurring after the announcement has not been fully understood and explained.
Since the publication of the classic paper of Fama, Fisher, Jensen and Roll (1969) that investigate the share price performance of splitting firms, many hypotheses have emerged and empirical studies have been conducted to explain the puzzling market reaction to stock splits. The more prominent hypotheses as presented by Leung, Rui and Wang (2005) are the signaling hypothesis, the optimal trading range hypothesis and the liquidity hypothesis.

Leung et al. (2005) argue that according to the signalling hypothesis, managers declare stock splits to convey favourable private information about the current value of the firm. They further argue that managers obtain pertinent information about the future because of their expertise in making operating and investment decisions; however splits credibly signal such information if it is costly for firms without favourable information to signal falsely. Brennan and Copeland (1988) argue that splits are costly because the fixed cost element of brokerage commissions increases the per-share trading costs of low-priced stocks. Mbugua (2004) presented evidence of signalling on stock dividends at Nairobi Stock Exchange.

The trading range hypothesis as presented by McNichols and Dravid (1990) suggests that splits realign per-share prices to a preferred price range. Since the need to realign share prices usually stems from a presplit price run up as presented by Lakonishok and Lev (1987), the trading range hypothesis links splits more to past performance than to future performance. Baker and Phillips (1994) report that managers frequently justify splits on the basis that the splits improve liquidity and marketability.
Maloney and Mulherin (1992) and Muscarella and Vetsuypens (1996) have argued that the liquidity hypothesis is based on the premises that corporate liquidity is affected by the per-share trading price. Maloney and Mulherin (1992) argue that if the trading price is too high, then the liquidity may decline and on the contrary a low per-share trading price attracts more individual investors and reduces trading costs. However, the evidence for the liquidity hypothesis is mixed. Conroy, Harris hand Benet (1990) show an increase in bid-ask spreads after stock split announcements. Ferris, Hwang and Sarin (1995) present results of a reduction in depth. Ohlson and Penman (1985) and Koski (1998) report an increase in return volatility. These results indicate that corporate liquidity decreases rather than increases after the split. In contrast, Maloney and Mulherin (1992) and Desai, Nimalendran and Venkataraman (1998) observe an increase in trading volume during the post-split period, and hence provide support for the liquidity hypothesis of stock splits. Further evidence from NSE; Simbovo (2006) indicates significant change in liquidity after stock split.

Ikenberry, Rankine, and Stice (1996) has argued that the signalling and trading range hypotheses are not mutually exclusive. If managers believe that there are benefits-from share prices trading within some range, yet also perceive that it is costly for prices to trade below some lower limit, the decision to split will be made conditional on managers' expectations about future performance. Ikenberry, Rankine, and Stice (1996) point out that pessimistic managers are less likely to undertake a split, fearing that a future decline in the firm's share price could result in the price falling below the acceptable range.
Under these conditions, a split can be interpreted by the capital market as a signal of management’s optimism about the future.

Despite extensive study, controversy surrounds the stock splits effects. Empirical evidence on stock splits supports both, the trading range as presented by Lakonishok and Lev (1987) and McNichols and Dravid (1990) and signaling hypotheses as presented by Grinblatt, Masulis, and Titman (1984) and McNichols and Dravid (1990), but is inconsistent on the notion that splits improve a stock’s trading liquidity. Simbovo (2006) testing the trading range hypothesis in Nairobi stock Exchange presents significant changes after stock splits but shows inconsistent results on liquidity after stock distributions( bonus issues) with generally statistically insignificant liquidity improvement.

Investors, analysts and researchers often draw inferences from managerial decisions made by corporate managers but not many studies have tried to determine the motivation for stock splits by asking the corporate managers involved in these decisions. Baker and Gallagher (1980) surveyed public company CFOs and found that more than 80 percent of them believe stock splits make it easier for small investors to purchase shares and thus increase the number of shareholders. In Kenyan market, only one study by Onyango (1999) sought to know from managers the reasons why firms issue stock dividends at Nairobi Stock Exchange and found that stock dividend is used by managers as a signal to the market that a company has invested in new projects that need to capitalize retained earnings.
Katerina et al. (2006) has argued that 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. This implies that there must be some benefit, either real or perceived, that results from a firm splitting its stock.

1.1.2 The Nairobi Stock Exchange (NSE)

The NSE was constituted in 1954 as a voluntary association of stock brokers registered under societies act. Since its inception the NSE has undergone various major changes. In early 1980s the government began to focus more intensely on the country’s financial system. It aimed at adopting more friendly reforms to foster competition and more sustainable economic growth. These reforms gained momentum in the late 1980s with privatization program targeting the state corporations such as Kenya Commercial Bank and Kenya Airways. The NSE was chosen as the market in which shares of the government in these state corporations were floated to the public (Kihumba, 1992).

In line with government’s aim to re-emphasize its commitment to the financial reform process and further boost investors’ confidence, a regulatory body to oversee NSE activities, amongst other objectives was created through the act of parliament, the Capital Market Authority Act (Cap 485 A) Laws of Kenya. The key words in the objectives of creating the Capital Markets Authority were “promotion” and “facilitation” of an orderly, fair and efficient capital market in Kenya (Kihumba, 1992).
NSE is an example of an emerging stock market that has been characterized by humble beginnings yet has grown considerably over time. It stands out as average stock market with great potential for growth, one that is making considerable effort to be a more significant driver of the economy in Kenya and East African region. In 1994 the NSE was rated by the International Finance Corporation (IFC) as the best performing emerging market in the world with a return of 179% in dollar terms. From 2003, the NSE has experienced robust activity and high returns on investments. It is a reference point in terms of setting standards for other markets in the East African region. As an emerging capital market it has faced challenges to its development and growth such as economic depression and political uncertainty, among others (Kibuthu, 2005).

Dickson and Muragu (1994) provide evidence of market efficiency in NSE. They present evidence that small markets such as Nairobi Stock Exchange provide empirical results consistent with weak-form efficiency.

1.1.3 Stock Splits at the NSE

Stock splits are a recent phenomenon at NSE. Unlike in more established markets where stock splits are more entrenched, firms intending to perform stock splits at NSE must seek additional approval of Capital Markets Authority (CMA) other than that of the shareholders. Section 6.2 of the NSE listing Manual does not mention stock split as one of the specific methods available to a firm intending to list additional securities. Under this section, an issuer may seek the listing of additional securities of the same class as
those already listed by way of a rights issue; capitalization issue (or bonus issue) in lieu of dividend or otherwise; scrip dividend; or any other method approved by the Authority.

In Kenya stock splits/stock dividends are fairly frequent mode of paying dividends. In the last 10 years about 20% of all companies quoted at NSE have declared stock split/stock dividend in each year. At the same time the rationale behind issuing stock dividends has been put into question with some companies seeming to abuse the issue. Good examples cited are; Kenya Finance bank which declared stock dividends in 1994/1995 and subsequently was put under receivership a few months after the 1995 dividend declaration; Unga group in 1998 issues stock dividends and subsequently reporting huge losses the same year (Mbugua, 2004).

The first ever stock split to be implemented at NSE was by Kenya Oil Limited (KENOL) which took place in June 2004. The company share price had reached a pitch height of Kenya Shillings 350 per share. On announcement of 10:1 stock split ratio the share price reached a record high of Kenya Shillings 420 per share to the date of splitting. Seven other companies have performed stock splits at NSE by the year 2007; the full schedule of NSE stock splits companies is presented in Table 1.
Table 1: Stock Splits Companies at NSE as at June 2007

<table>
<thead>
<tr>
<th>FIRM</th>
<th>SPLIT RATIO</th>
<th>ANNOUNCEMENT DATE</th>
<th>BOOK CLOSURE DATE</th>
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<tr>
<td>KENYA OIL</td>
<td>10:1</td>
<td>June 23, 2004</td>
<td>July 5, 2004</td>
</tr>
<tr>
<td>EABL</td>
<td>5:1</td>
<td>August 27, 2004</td>
<td>November 26, 2004</td>
</tr>
<tr>
<td>EA CABLES</td>
<td>10:1</td>
<td>August 10, 2006</td>
<td>September 4, 2006</td>
</tr>
<tr>
<td>BBK</td>
<td>5:1</td>
<td>November 8, 2006</td>
<td>November 29, 2006</td>
</tr>
<tr>
<td>SASINI</td>
<td>5:1</td>
<td>December 18, 2006</td>
<td>February 14, 2007</td>
</tr>
<tr>
<td>CMC HOLDINGS</td>
<td>10:1</td>
<td>January 11, 2007</td>
<td>February 26, 2007</td>
</tr>
<tr>
<td>KCB</td>
<td>10:1</td>
<td>March 5, 2007</td>
<td>April 2, 2007</td>
</tr>
</tbody>
</table>

Source: Corporate Actions: NSE Database, 22nd June, 2007
1.2 Statement of the Research Problem

Stock splits remain one of the most popular and least understood phenomena in equity markets. Easley, O'Hara, and Saar (2001) assert that the traditional wisdom is that stock splits are "good information"—that companies split their stocks when they are confident that earnings momentum will continue to push their stock's price upward. The positive stock price reaction accompanying the announcement of a split reported by Grinblatt et al. (1984) and Lamoureux and Poon (1987) gives credence to this optimistic view. Yet, as argued by Easley et al. (2001), why a split per se is necessary is unclear since there is no bound limiting a stock's price level, and alternative signaling devices (such as dividend increases) are used extensively.

The widely-held view among investors is that stock splits are a positive event for the company. On the other hand, neo-classical financial theory suggests that splits are simply numeraire changes that should have no impact on the market value of the firm (Dhar, Goetzmann, Shepherd, and Zhu, 2003). Financial economic studies over the years have addressed this apparent contradiction and discovered empirical regularities associated with stock splits. In particular, splits are related to changes in the risk, return, volume and liquidity characteristics of the stock.

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. This implies that there must be some benefit, 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? (Katerina et al., 2006).

Empirical evidence; Fama et al. (1969); Asquith, Healy and Palepu (1989); Katerina et al. (2006) presents that stock splits are usually preceded by a period during which the rates of return (including dividends and capital appreciation) on the securities to be split are unusually high. The period of high returns begins; however, long before any information (or even rumour) concerning a possible split is likely to reach the market. The empirical properties of stock splits as presented by Conroy and Harris (1999) also appear to be fundamentally different from those of stock dividends; apparently, it is inappropriate to view stock splits and stock dividends as the same phenomenon executed on different scales. Evidence from Simbovo (2006) that indicated conflicting results between results of liquidity changes on stock splits stocks and those of stock dividends stocks and NSE further support the need to isolate stock splits from stock dividends especially when testing information content of stock splits.

NSE has been experiencing a significant bullish market since 2002 with securities across all counters recording increasing stock prices. Consistent with empirical arguments, NSE has experienced eight stock splits events between the years 2004 and 2007. This study intends to establish the securities price reaction to these stock splits at NSE. Prior study by Mbugua (2004) conducted using data of stock dividend companies between 1997 and
2003 did not include a single stock split since the first stock split at NSE occurred subsequently; in 2004.

This study therefore seeks to answer the following research questions:

1. Do securities returns of stock split firms change with announcement of stock splits that are not mixed with announcement of stock dividends?
2. What is the effect of such stock split announcement on the securities returns of the stock split firm at NSE?

1.3 Objectives of the Study

The objectives of the study are:

1) To establish the behavior of securities returns around time of stock splits at NSE
2) To establish the effects of stock splits on the securities returns at NSE

1.4 Value of the Study

This study will contribute to the existing literature in several ways:

It extends the international empirical evidence on stock splits to an emerging important stock market, the Nairobi Stock Exchange. There is no prior research on the stock performance behavior of firms listed on NSE around stock split announcement date. This study will therefore provide knowledge to scholars in the field of financial theory and will aid future research work in the area.
The findings of this study will assist investors in making more informed decisions when trading in Nairobi Stock Exchange. The study would reveal whether and how stock splits impact on stock price determination; which is of great importance in reaching investment decisions.

The findings of this study would equip financial advisors with empirical knowledge related to stock splits that would enable proper financial analysis hence informed financial advisory.
2 LITERATURE REVIEW

2.1 Stock Split Concept and Hypotheses

Leung et al. (2006) has argued that theoretically, stock splits should be cosmetic corporate events as they merely involve the breakup of one share into a certain number of shares and a reduction of a higher to a lower per share trading price without changing shareholders’ wealth and relative shareholdings. However, although early empirical studies find no abnormal performance after stock splits (Fama et al., 1969), most recent studies find a positively significant market reaction to stock split announcements. Stock splits do not appear to be as cosmetic as they should be. In the finance literature, the role of stock splits remains an enigma.

Since the publication of the classic paper of Fama et al. (1969) that investigated the share price performance of splitting firms, many hypotheses have emerged and empirical studies have been conducted to explain the puzzling market reaction to stock splits. The more prominent hypotheses are the signaling hypothesis, the optimal trading range (tick size) hypothesis and the liquidity hypothesis as presented by Leung et al. (2006). The ensuing section discusses these main hypotheses.

2.1.1 Signaling Hypothesis

According to the signaling hypothesis, managers declare stock splits to convey favorable private information about the current value of the firm. Managers obtain pertinent information about the future because of their expertise in making operating and
investment decisions (Ikenberry, Rankine and Stice, 1996). Angel (1997) argue that the announcement and execution of a stock split is viewed by the investment community as a positive signal about the prospects for the firm, since it is often followed by higher earnings per share and cash dividends. Angel (1997) points out that since stock splits often occur after a stock has increased in value, the stock split can be interpreted as a sign from management that greater future growth can be expected.

The signaling hypothesis presented by Grinblatt et al. (1984) argues that stock splits convey information about the current performance and future prospects of the splitting firms. To be a valid and credible signal, the signal has to be costly. Stock splits are costly signals because the fixed component of the brokerage commission increases the post-split per-share trading cost (such as odd-lot trading costs and administrative cost) of the lower priced shares as presented by Brennan and Copeland (1988) and Brennan and Hughes (1991).

2.1.2 Optimal Tick Size Hypothesis

Angel (1997) introduced the optimal tick size hypothesis. According to this hypothesis, in equity markets there is an institutionally mandated minimum absolute tick size, which is optimal relative to the share price. A wider tick size reduces transaction costs and offers more incentives for limit orders, enhancing liquidity. On the other hand, a wider tick size increases the cost to investors inherent in a wider percentage spread. Hence, there is a cost trade-off and an optimal point where the companies want to be. Leung et al. (2006)
has argued that a stock split is one mechanism used by the companies to move their share prices into the optimal range of the tick size. The optimal range may be because of a specific clientele they wish to attract or a particular dispersion in ownership they wish to achieve, but in either case it reflects the view that greater liquidity for stocks may arise in certain price ranges than in others. The clientele preferring a lower price range is usually thought to be uninformed or small investors (Easley et al., 2001).

2.1.3 Liquidity Hypothesis

Liquidity is described by Lamoureux and Poon (1987) as essentially the degree to which a trader is able to effect a transaction at a favourable (equilibrium) price. There are many measures of liquidity, which Katerina et al. (2006) has expressed as either measures of friction or activity reflecting the two dimensions of liquidity. Friction is identified as the price concession for immediacy; whereby activity measures reflect extent of trading. An increase in a friction measure indicates reduced liquidity, while an increase in an activity measure indicates increased liquidity. Friction measures include the bid-ask spread measures, price measures, and return measures. Activity measures can be categorized into depth measures, volume measures and size measures.

The most common rationale behind stock splits according to liquidity hypothesis as presented by Leung et al. (2006) is that there is an optimal price range for securities. This optimal price range is a relatively lower price for the underlying security. It is assumed
that the liquidity/marketability of the security will improve after the split, as the lower price of the stock will attract more small investors.

According to Angel (1997) positioning a stock within its optimal trading range increases liquidity as it lowers the nominal share price, which lowers the cost of a round lot of stock. Liquidity is also created by the increased number of new shareholders being attracted by the lower share price. Angel (1997) argues that liquidity is further boosted by the fact that stock splits provide stronger financial incentives for intermediaries such as stockbrokers and dealers to promote the stock. Larger volume due to a greater number of shares traded tends to attract broker/dealer attention, which in turn attracts additional investor attention.

2.2 Empirical Evidence on Stock Splits and Securities Returns

The presence of positive abnormal returns around the stock split announcement that is found in many empirical studies: Ikenberry et al. (1996); Mukherji and Walker (1997) and Ikenberry and Ramnath (2002) provides evidence for the signalling hypothesis.

Ikenberry et al. (1996) examine the market reaction to split announcements by computing five day market-adjusted returns from two days before to two days after the announcement. Market-adjusted returns are calculated by subtracting the five-day holding period return on the Center for Research in Security Prices (CRSP) value-weighted New York Stock Exchange/American Stock Exchange (NYSE-ASE) portfolio from the five-day holding period return for the splitting firms. They assess significance levels using
cross-sectional standard errors. The results support the hypothesis that, in addition to bringing share prices back into a trading range, splits also serve as positive signals to the market about higher future returns.

Mukherji and Walker (1997) investigate a broad sample of stock splits by firms without confounding events, controlling for industry and size effects. Their results show that stock splits increase the numbers of both individual and institutional shareholders, and they do not affect the proportion of equity held by institutions. They present that abnormal announcement returns are positively correlated with changes in the total number of shareholders. These findings support the signaling hypothesis.

Ikenberry and Ramnath (2002) test the underreaction hypothesis of the market using a self-selected event that a company can choose to engage in – a stock split – to examine the sluggish revision in earnings expectations. Using control firms matched on the basis of market capitalization, value/growth, momentum and nominal share price, they present a buy-and-hold abnormal return of 9% in the year following the announcement for firms announcing stock splits. The positive drift suggests that stock split has signaling effect.

Contrary to above argument, Kadiyala and Vetsuypens (2002) in their study of changes in short-interest positions around stock splits posit that positive stock returns at split announcements cannot distinguish between signalling and liquidity effects. They argue that, whenever the event that conveys a positive signal also causes contemporaneous liquidity improvements, stock returns are less useful for testing signalling theories. There
is no ambiguity for short interest. They argue that short interest should decline if the event conveys a positive signal as short traders respond to this signal by reducing their short position in the firm. On the other hand, liquidity-enhancing splits should cause an increase in short interest. Short traders are exposed to two significant transaction costs: the opportunity cost of the margin that must be posted by the short seller, and the exposure to a "short squeeze." A short squeeze occurs when institutional investors take large positions in already heavily shorted stocks and then request delivery of the shares. This transaction reduces the liquidity of the shares and forces a premature closing out of the short position. Thus, short interest represents an appealing metric to test for signaling effects. They present weak evidence that stock splits convey a positive signal.

Brennan and Copeland (1988b), McNichols and Dravid (1981), and Brennan and Hughes (1991), interpreted the positive stock market reaction to split announcements as a response to managers signaling favorable inside information. Brennan and Copeland (1988b) developed a model of stock-split behavior in which the split serves as a costly signal of managers' private information because stock trading costs depend on stock prices. They present empirical evidence confirming the relation between stock trading costs and stock prices. The signaling model is estimated using a large sample of splits and explains a substantial fraction of the split-announcement returns.

McNichols and Dravid (1981) conduct three tests of the hypothesis that managers signal their private information through split factor choice. Their tests of the signaling hypothesis rely on the notion that managers prefer their firms' shares to trade in a certain
price range. They document the split factors are increasing in pre-split share prices and decreasing in the pre-split market value of equity. The first relation is consistent with the notion that firms split their shares to bring them into a specific range, and the second is consistent with the idea that larger firms prefer a higher trading range. Signaling explanations are consistent with abnormal increases in earnings and/or dividends around the split.

Lamoureux and Poon (1987) present that a split affects several variables, each of which is related to liquidity. First, (explicit) transactions costs are increased by a split. On the other hand, their analysis indicates that splitting stocks have a wider ownership base following the split and also an increase in the number of daily transactions post-split. These two effects may serve to increase a stock's liquidity post-split. They posit the most telling measure of the degree of liquidity is dollar value of shares traded per unit of time. Using this as a measure, they conclude that splits induce permanent reductions in liquidity.

A stock split increases liquidity as it lowers the nominal share price, which lowers the cost of a round lot of stock. There is increased number of new shareholders being attracted by the lower share price. Larger volume due to a greater number of shares traded tends to attract broker/dealer attention, which in turn attracts additional investor attention (Angel, 1997).
Leung et al. (2006) analyze the effect of stock splits using intraday data and insider trading data in Hong Kong from 1980 to 2000. They find significant abnormal returns around the announcement which they attribute the positive reaction to favourable signals and improved liquidity.

2.3 Empirical Evidence on Stock Splits/Stock Dividends at NSE

Onyango (1999) sets out to establish the reasons behind stock dividends and any gains derived from the bonus issues. From a sample of 62 dividend stocks made during period 1994 to 1998, the study found out that managers believed that stock dividend brings benefits to a firm and helps conserve a firm’s cash. Most managers use stock dividend as a signal to the market that the company has invested in new projects that need to capitalize retained earnings. It was observed in this study that shareholders tend to receive higher cash dividends after bonus issue. There was an increase in cash dividend of 10.23% after the stock dividend; which was statistically significant.

Mbugua (2004) studied the impact of stock dividend announcement on share prices and the impact of the stock dividend size on stock return. Sample data of 24 companies collected between October 1997 and March 2003 for all stock distributions with no differentiation between stock split and stock dividend was used. The comparison period return approach was used to analyze the data. The study found that stock dividend announcement had an impact on stock returns and further results indicated that the size of dividend has an effect on stock return.
Recent studies by Simbovo (2006) and Cheruiyot (2006) have yielded inconsistent results in stock dividends announcement. Simbovo (2006) sought to establish reasons behind stock splits and the effects of stock split/stock dividend on the liquidity of a company shares. The study tested the optimal trading range hypothesis as one of the reasons for stock splits by testing liquidity using mean trading activity ratio (TAR). TAR was calculated as the number of shares traded as a ratio of number of tradable shares issued. While the results indicated clear evidence of improved liquidity on stock split firms, there was conflicting results on liquidity changes of stock dividend (25% and above of issued shares) distribution firms.

Cheruiyot (2006) sought to establish the impact of right issue on security prices. Using sample data of 6 companies between April 1996 and December 2002 (the study applied the market model and controlling for concurrent events) the study found out that right issues have information content but the direction and extent of the impact varied across the entire sample.

### 2.4 Conflict in Empirical Evidence

Despite extensive studies, some controversy surrounds the stock splits effects. Empirical evidence on stock splits supports both, the trading range as presented by Lakonishok and Lev (1987), and McNichols and Dravid (1990) and signaling hypotheses presented by Grinblatt et al. (1984), and McNichols Dravid (1990), but is inconsistent on the notion that splits improve a stock’s trading liquidity. Huang, Liano and Pan (2006) present that
stock splits are not useful signals of a firm's future earnings as they find little evidence that stock splits are positively related to future profitability.

Investors, analysts and researchers often draw inferences from managerial decisions made by corporate managers but not many studies have tried to determine the motivation for stock splits by asking the corporate managers involved in these decisions. Baker and Gallagher (1980) surveyed public company CFOs and found that more than 80 percent of them believe stock splits make it easier for small investors to purchase shares and thus increase the number of shareholders.

2.5 Efficient Market Hypothesis (EMH)

Stock market efficiency is an important concept, in terms of an understanding of the working of the capital markets. Poshakwale (1996) argued that the efficiency of the emerging markets assumes greater importance as the trend of investments is accelerating in these markets as a result of regulatory reforms and removal of other barriers for the international equity investments.

The term market efficiency is used to explain the relationship between information and share prices in the capital market literature. Fama (1970 and 1991) provides the formal definition of market efficiency. He classifies market efficiency into three categories namely, weakform, semi strongform and strongform. In its weak form, market efficiency hypothesis (EMH) states that the stock returns are serially un-correlated and have a constant mean. In other words, a market is considered weak form efficient if current
prices fully reflect all information contained in historical prices, which implies that no investor can devise a trading rule based solely on past price patterns to earn abnormal returns. A market is semi strong efficient if stock prices instantaneously reflect any new publicly available information and strong form efficient if prices reflect all types of information whether available publicly or privately.

Market efficiency has an influence on the investment strategy of an investor because if securities markets are efficient, trying to pick winners will be a waste of time. Since in an efficient market, the prices of securities will reflect the market’s best estimate of their expected return and risk, taking into account all that is known about them. Therefore, there will be no undervalued securities offering higher than deserved expected returns, given their risk. So, in an efficient market, an investment strategy concentrating simply on the overall risk and return characteristics of the portfolio will be more sensible (Poshakwale, 1996). Rutterford (1983) argues that if however, markets are not efficient, and excess returns can be made by correctly picking winners, then it will pay investors to spend time finding these undervalued securities.

2.6 Studies on Efficient Market Hypothesis at NSE

Ondigo (1995) examined information content of annual reports and accounts of eighteen blue chips companies quoted at NSE between 1990 and 1994. The study revealed that the annual reports and accounts of the sample companies do not have information content which was statistically significant. This study did not however provide any evidence as
far as semi-strong model of efficient market hypothesis is concerned and the results of the study were inconclusive.

Dickinson and Muragu (1994) provide evidence of market efficiency in Nairobi Stock Exchange. They conclude that small market such as Nairobi Stock Exchange provides empirical results consistent with weak-form efficiency.

Onyango (2004) studied 16 companies at NSE between 1998 and 2003 and concluded that earnings announcements contain relevant information to which are fully impounded in stock prices prior to or almost instantaneously at time of announcement. The year 2003 results showed the year as an outlier with evidence of momentum in stock return. The secondary evidence resulting from the study is that NSE shows presence of semi-strong model of EMH.

Kiptoo (2006) sought to establish the information content of cash dividend announcements by companies quoted at the NSE. The study was to determine whether there was a positive and significant abnormal return following the announcement of an increase in cash dividend from a sample data of thirteen companies between 1998 and 2002. The study did not control for confounding effects such as negative earnings. It was found that there was a significant reaction by the market to dividend announcement.
2.7 Measuring Return of a Security

This section discusses a number of approaches that are available to calculate normal return of a given security. MacKinlay (1997) classifies them into two categories: Statistical and economic models. Statistical models rely on statistical assumptions concerning the behaviour of asset returns and do not depend on economic arguments. The constant mean return and the market models are the most common statistical models. Economic models offer the opportunity to calculate more precise measures of normal return using economic restrictions.

A security’s price performance can only be considered ‘abnormal’ relative to a particular benchmark. Thus, it is necessary to specify a model generating normal returns before abnormal returns can be measured. Two general models of the process generating ex ante expected returns are discussed below. These models are general representations of the models which have been assumed in event studies. For each model, the abnormal return for a given security in any time period t is defined as the difference between its actual ex post return and that which is predicted under the assumed return-generating process. Thereafter, the economic models are briefly discussed.

2.6.1 Constant Mean Return Model

This model, as the name implies, assumes that the mean return of a given security is constant suggest through time. That is, the security return does not relate to the market return.
Let \( \mu_i \) be the mean return for asset \( i \) then the constant mean return model is

\[
R_{it} = \mu_i + \zeta_{it}
\]

\[
E(\zeta_{it}) = 0 \quad \text{var}(\zeta_{it}) = \sigma^2 \zeta_{it}
\]

Where \( R_{it} \) is the period-\( t \) return on security \( i \) and \( \zeta_{it} \) is the time period \( t \) disturbance term for security \( i \) with an expectation of zero and variance \( \sigma^2 \zeta_{it} \).

Although the constant mean return model is perhaps the simplest model, Brown and Warner (1980) find it often yields results similar to those of more sophisticated models. This lack of sensitivity to the model can be attributed to the fact that the variance of the abnormal return is frequently not reduced much by choosing a more sophisticated model.

When using daily data the model is typically applied to nominal returns. With monthly data the model can be applied to real returns or excess returns (the return in excess of the nominal risk free return generally measured using Treasury Bill rates with one month to maturity) as well as nominal returns (MacKinlay, 1997).

### 2.6.2 Market Model

The market model is statistical model which relates to the return of any given security to the return of the market portfolio. The model’s linear specification follows from the assumed joint normality of asset returns. For any security \( i \) the market model is:

\[
R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}
\]

\[
E(\epsilon_{it}) = 0 \quad \text{var}(\epsilon_{it}) = \sigma^2 \epsilon_i
\]

Where \( R_{it} \) and \( R_{mt} \) are the period returns on security \( i \) and the market portfolio, respectively and \( \epsilon_{it} \) is the zero mean disturbance term \( \alpha_i, \beta_i \), and \( \sigma^2 \epsilon_i \) are the parameters of
the market model. In applications a broad based stock index is used for market portfolio like the NSE 20 Index.

The market model represents a potential improvement over the constant mean return model. By removing the portion of the return that is related to variation in the market's return the variance of the abnormal return is reduced. This in turn can lead to increased ability to detect event effects. The benefit from using the market model will depend upon the coefficient of determination, $R^2$ of the market model regression. The higher the $R^2$ the greater is the variance reduction of the abnormal return and the larger is the gain.

### 2.6.3 Economic Models

Economic models can be cast as restrictions on the statistical models to provide more constrained normal return models. Two common economic models which provide restrictions are the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT). The CAPM of Sharpe (1964) and Lintner (1965) is an equilibrium theory where the expected return of a given asset is determined by its covariance with the market portfolio. The APT presented by Stephen Ross (1976) is an asset pricing theory where the expected return of a given asset is a linear combination of multiple risk factors.

MacKinlay (1997) points out that there is the possibility that the results of the studies may be sensitive to the specific CAPM restrictions. Because this potential for sensitivity
can be avoided at little cost by using the market model, the use of CAPM has almost ceased.

MacKinlay (1997) argues that with APT the most important factor behaves like a market factor and additional factors add relatively little explanatory power. Thus the gains from using an APT motivated model versus the market model are small. The main potential gain from using a model based on the arbitrage pricing theory is to eliminate the biases introduced by using CAPM. However because the statistically motivated models also eliminate these biases for event studies such models have become more dominant. The market model is the most commonly used model in estimating securities returns.
3 RESEARCH METHODOLOGY

3.1 Research Design

The quantitative research techniques were adopted to test the effects of stock splits announcement on the performance of securities at NSE. Through event study methodology variables were estimated using the market model, causation determined and statistically tested for significance.

3.2 The Population

The study confined itself only to companies listed at the Nairobi Stock Exchange (NSE). This was out of necessity because the methodology of event study that was employed is dependent on existence of stock prices generated by a stock exchange. The population of companies during the study was fifty three companies listed under the appendix 1.

3.3 The Sample

The sample consisted of all eight companies that have performed stock splits at the NSE as at June, 2007.

3.4 Data Collection

Secondary data was used in this research. The data comprised of daily security prices, firms' number of shares outstanding and stock splits announcement dates. Previous research by Maloney and Mulherin (1992) shows an abnormal increase in trading activity beginning ten days prior to the split announcement. For each stock split, the daily stock returns were obtained for 141 trading days surrounding the announcement date ($t = -130$ to $t = 130$).
to \( t = +10 \). These 141 days were divided into two groups, the estimation period, that is, days from \( t = -130 \) to \( t = -11 \) and the test period (TP), that is, days from \( t = -10 \) to \( t = +10 \), with \( t=0 \) corresponding to the date of the stock split announcement. This approach is consistent with one in the study by Katerina et al. (2006).

Moreover, Fama et al. (1969) present evidence that indicates that on the average the market’s judgments concerning the information implications of a split are fully reflected in the price of a share at least by the end of the split month but most probably almost immediately after the announcement date. So the ten day post split period was considered sufficient for the purpose the test.

### 3.5 Data Analysis Techniques

The event study methodology was used to evaluate the abnormal share price reaction of the corporate announcements of stock splits. The event date, \( t = 0 \), is the announcement date recorded in the corporate announcements data of the NSE database. Following a previous study by Leung et al. (2006) both the market model and the control firm approaches were used to estimate abnormal share price reactions to the announcement of stock splits. A histogram was constructed to plot the stock prices before and after the stock split event to establish their behavior.

For the market model, returns on the NSE Index were used as the proxy of the market returns. The returns were transformed into residuals through the following single-index market model equation:
\[ R_{it} = a + bR_{mt} + \mu_{it} \]

Where:

- \( R_{it} \) = Daily return of stock i
- \( R_{mt} \) = Daily value-weighted market returns (NSE 20 index)
- \( \mu_{it} \) = Return residual for stock i at time t
- a and b = Regression coefficients and constants determined by simple regression using daily data for up to 120 days before the 21 days test period.

Using the above model, the residuals were estimated for each of 21 days observation window (test periods). These residuals were transformed through division by company specific estimated standard deviations of the market model residuals (as a deflator) over the estimation period to help attain some distributional comparability across firms. The residuals were then aggregated across sample firms and then cumulated over the test period to determine the cumulative average abnormal returns (CAAR).

When using event study methodology to measure the abnormal share price reaction of an event, the clustering of corporate events is a common problem. Empirical evidence suggests that when a dividend-paying firm announces a split it is also most likely to announce a dividend increase (Fama et al., 1969). In the conventional market model, the market return is used as a benchmark to estimate the abnormal share price performance of the events. However, the market return may be affected by the various announcements made by the firms in the market. Barber and Lyon (1997) presents that the clustering problems of corporate events may create bias in abnormal return measurement. To avoid the potential impact of event clustering, the control firm approach for abnormal return
computation was employed. The return of a control firm that is clear from the event under
examination was selected as a benchmark for abnormal return computation.

Fama and French (1992) suggest that return is related to firm size and the book-to market
ratio. Firm size is estimated by market value, which is the product of closing price and
number of outstanding shares. The book-to-market ratio is the proportion of the average
of the beginning and ending values of shareholders’ equity to the market value of equity
(the product of the monthly average closing price and the number of outstanding shares).

To select an appropriate firm as a benchmark for abnormal return computation, the
control firm approach involves a matching process to choose a control firm that possesses
similar characteristics in terms of market value and book-to-market ratio with a sample
firm. The yearly market value and yearly book-to-market value for all of the companies
in same investment segment of the NSE were estimated. The yearly values were used as
the microstructure at NSE could not support monthly analysis. A control firm was
matched to a sample firm if the control firm held the same ranking labels for the market
value and book-to market ratio as the sample firm. Using the control firm approach, the
abnormal return on day t μ_{it} were estimated as the difference between the realized returns
of sample firm i and of matched control firm j.

For both methods, to gain further insight of the relationship between the stock splits and
security returns, the student t-test statistic for the significance of the abnormal return was
computed using the mean abnormal return and the standard deviation measured in the estimation period over 120 days from $t = -130$ to $t = -11$. 
4 DATA ANALYSIS AND FINDINGS

4.1 Introduction

The two objectives of the study were one, to establish the behavior of securities returns around time of stock split and two, to establish the relationship between stock split and securities' returns at the Nairobi Stock Exchange.

To achieve these objectives the event study methodology of the single-index market model was used to regress the stock returns and the market returns (NSE 20 index) during the estimation period to get the constants determined by simple regression using daily data for up to 120 days before the 21 days test period. The constants were then used to predict stock returns during the event window hence determine the excess returns (or residuals).

The excess returns were standardized before aggregating the same across sample firms and over the event period to determine the cumulative average abnormal returns (CAAR). This method, as argued by Henderson (1990) has been proven to be robust to most of econometric problems of regression models such as; non-normality of residuals, serial correlation and nonsynchronous trading, residuals variance shifts, correlation between residuals and the market return and contemporaneous covariance.
4.2 Market Reaction to Stock Split Announcement

The CAAR was graphed to observe the behavior of stock return on stock split announcement. Figure 1 represents the CAAR during the event period. CAAR are observed to increase significantly starting three days before the announcement. The CAAR are observed to start decreasing sharply after day one post announcement. This decreasing trend continues up to the eighth day after which a steep increase is observed.

It is evident that positive abnormal returns are observed on the day of stock split announcement as well as two days before announcement and several days after the announcement. The market perceives a stock split as good news according to the signaling hypothesis, for the time period the event was investigated.
To establish whether the CAAR observed were statistically significant over the test period, t-test was conducted. A null hypothesis was constructed that stated that the mean average of residuals over the test period is zero; that is to suggest there is no abnormal reaction to stock split announcement. The alternative hypothesis was that the mean average residual over the test period is not equal to zero. A two-tailed single sample test was conducted to test the null hypothesis. Table 2 presents the summary statistics for 2-tailed t-test at 95% confidence level. A low value of p (≤ 0.001) presented on the results supports rejection of the null hypothesis. The P value is a probability, with a value ranging from zero to one that the mean average residual over the test period will be
greater than zero. There is evidence that the actual mean of residuals over the test period is significantly different from the hypothesized mean of zero.

**Table 2: Single Sample t-test Statistics: Market Model**

<table>
<thead>
<tr>
<th>N</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing or Deleted</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>2.77597</td>
</tr>
<tr>
<td>St. Dev (n-1)</td>
<td>2.6294</td>
</tr>
<tr>
<td>Null Hypothesis (POPULATION)</td>
<td>0</td>
</tr>
<tr>
<td>Calculated t with 20 D.F.</td>
<td>4.84</td>
</tr>
<tr>
<td>p (2 - sided test)</td>
<td>( \leq 0.001 )</td>
</tr>
<tr>
<td>95% C.I. about Mean</td>
<td>(1.57676, 3.97517)</td>
</tr>
</tbody>
</table>

A low value of p supports rejection of the null hypothesis. There is evidence that the actual mean is different from the hypothesized mean.

### 4.3 Test of Robustness

When using event study methodology to measure the abnormal share price reaction of an event, the clustering of corporate events is a common problem. Fama et al. (1969) suggests that when a dividend-paying firm announces a split it is also most likely to announce a dividend increase. Table 3 summarizes stock split firms and other events that occurred concurrently with the stock split announcement at the NSE.
To control for the potential impact of event clustering the control firm approach returns was employed. A return of firm which did not announce stock split but whose P/E ratio was equal or close to the sample firm was used as a benchmark for abnormal return computation.

The abnormal returns were calculated as the difference between the return of the sample firm and that of the matching control firm over the test period. The abnormal returns were aggregated by averaging them across firms and cumulating them over the test period. Figure 2 indicates the CAAR during the event period using the control firm approach.

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>SPLIT RATIO</th>
<th>ANNOUNCEMENT DATE</th>
<th>OTHER EVENT</th>
<th>DIVIDEND ANNOUNCEMENT</th>
<th>PREVIOUS DIVIDEND</th>
<th>CURRENT DIVIDEND</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KENYA OIL</td>
<td>10:1</td>
<td>June 23, 2004</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>EABL</td>
<td>5:1</td>
<td>August 27, 2004</td>
<td>BONUS 1:5</td>
<td>FINAL DIV</td>
<td>15.00</td>
<td>18.00</td>
<td>3.00</td>
</tr>
<tr>
<td>EA CABLES</td>
<td>10:1</td>
<td>August 10, 2006</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>ICDC</td>
<td>10:1</td>
<td>October 19, 2006</td>
<td>NIL</td>
<td>FINAL DIV</td>
<td>3.00</td>
<td>4.00</td>
<td>1.00</td>
</tr>
<tr>
<td>BARCLAYS</td>
<td>1:5</td>
<td>November 8, 2006</td>
<td>BONUS 1:3</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>SASINI</td>
<td>5:1</td>
<td>December 18, 2006</td>
<td>BONUS 1:5</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>CMC</td>
<td>10:1</td>
<td>January 11, 2007</td>
<td>NIL</td>
<td>1ST &amp; FINAL</td>
<td>1.50</td>
<td>2.30</td>
<td>0.80</td>
</tr>
<tr>
<td>KCB</td>
<td>10:1</td>
<td>March 5, 2007</td>
<td>NIL</td>
<td>1ST &amp; FINAL</td>
<td>4.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>
From the graph there is evidence of steep increase in CAAR during the event day similar to the observations presented on Figure 1 above.

Results of single sample t-test presented on table 4 further indicate a low p value at 95% confidence interval supporting the rejection of the null hypothesis since the mean residuals are significantly different from mean of zero.
Table 4: Single Sample t-test Statistics: Control Firm Approach

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>21</td>
</tr>
<tr>
<td>Missing or Deleted</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>0.15685</td>
</tr>
<tr>
<td>St. Dev (n-1)</td>
<td>0.09485</td>
</tr>
<tr>
<td>Null Hypothesis (POPULATION)</td>
<td>0</td>
</tr>
<tr>
<td>Calculated t with 20 D.F.</td>
<td>7.58</td>
</tr>
<tr>
<td>p (2 - sided test)</td>
<td>≤ 0.001</td>
</tr>
<tr>
<td>95% C.I. about Mean</td>
<td>(0.11359, 0.20011)</td>
</tr>
</tbody>
</table>

A low value of p supports rejection of the null hypothesis. There is evidence that the actual mean is different from the hypothesized mean.

4.4 Summary of Findings

Positive abnormal returns are observed on the day of stock split announcement as well as two days before announcement and several days after the announcement. The abnormal returns are observed over the event period even after controlling for event clustering. The two tailed t-tests present statistically significant results to support that stock split announcement has effect on returns of the stock-splitting firms. The market perceives a stock split as good news according to the signaling hypothesis, for the time period the event was investigated.
5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Stock splits remain one of the most popular and least understood phenomena in equity markets. The widely-held view among investors is that stock splits are a positive event for the company. On the other hand, neo-classical financial theory suggests that splits are simply numerical changes that should have no impact on the market value of the firm. Financial economic studies over the years have addressed this apparent contradiction and discovered empirical regularities associated with stock splits.

Prior related research at the NSE had failed to make important distinction between stock dividend and stock split. This study sought to establish the behavior of securities of stock-splitting firms at Nairobi Stock Exchange.

Using event study methodology tests were performed to establish the reaction of the securities around the time of stock split announcement. The control firm approach was used to control for event clustering. This involved selection of a firm with similar characteristics as the stock splitting firm in terms of size market value and book-to-market ratios.

Positive abnormal returns are observed on the day of stock split announcement as well as two days before announcement and several days after the announcement. The two tailed t-tests present statistically significant results to support that stock split announcement has
effect on returns of the stock-splitting firms. This is to suggest the market perceives a stock split as good news according to the signaling hypothesis, for the time period the event was investigated. There are consistent results observed after controlling for event clustering.

5.2 Limitations of the Study

Sample firm that did another announcement simultaneously with stock split announcement was eliminated from the sample. A control firm bearing similar characteristics as the sample firm was selected as a replacement. However the matching process could not be perfectly achieved and only chose firms that were close to sample firm’s characteristics. This might have affected the power of the test performed.

There existed gaps on data collected due to lack of trading of same sample firms over the estimation period. This caused mismatching of the values for daily return of sample stock and daily value-weighted market returns. The result was that the betas of infrequently traded securities were downward biased, while shares trading with more than average frequency have upward biased betas.

5.3 Suggestions for Further Research

This study concentrated on the effects of stock splits regardless of the split factor. Further studies need to be conducted to determine the effects of the stock split factor in relation to the securities returns.
The study tested the behavior of securities around few days of the event. Further study may be conducted to test the long term performance of the securities after stock split with objective of testing for momentum and reversals in the long run.

The tests on this study were conducted to firms across industries. A similar intra-industrial study may be conducted to determine the effects of stock splits on non-stock splitting firms within the industry. That is, whether there are intra-industrial reactions; if shareholders of non-splitting firms experience significant positive abnormal returns during the stock split announcement period of their industry counterparts.
REFERENCES


activity following stock splits, Review of Quantitative Finance and Accounting 5, 27-41.


Kihumba (1992), The capital market authority as an institution, Unpublished paper, Nairobi Stock Exchange Library.


Onyango, S.O, (1999), *A study to establish factors managers consider before declaring bonus issues and the benefits to shareholders at NSE*, Unpublished MBA paper, University of Nairobi.


Appendix

Appendix 1: List of Companies Quoted At the NSE – 2007

Main Investments Market Segment (MIMS)

Agriculture
1. Unilever Tea (K) Ltd.
2. Rea Vipingo Ltd.
3. Sasini Tea & Coffee Ltd.
4. Kakuzi Ltd.

Commercial and Services
1. Access Kenya Group
2. Marshalls E.A. Ltd.
3. Car & General Ltd.
4. Hutchings Biemer Ltd.
5. Kenya Airways Ltd.
6. CMC Holdings Ltd.
7. Uchumi Supermarkets Ltd.
8. Nation Media Group Ltd.
9. TPS (Serena) Ltd.
10. ScanGroup Ltd.
11. Standard Group Ltd.

Finance and Investment
1. Barclays Bank of Kenya Ltd.
2. CFC Bank Ltd.
3. Housing Finance Company of Kenya Ltd.
4. ICDC Investment Company Ltd.
5. Kenya Commercial Bank Ltd.
7. Pan Africa Insurance Holdings Co. Ltd
10. Standard Chartered Bank Ltd.
11. National Industrial Credit Bank Ltd.
12. Equity Bank Ltd.

**Industrial and Allied**

1. Athi River Mining Ltd.
2. BOC Kenya Ltd.
4. Carbacid Investments Ltd.
5. Olympia Capital Holdings Ltd.
6. E.A. Cables Ltd.
7. E.A. Breweries Ltd.
8. Sameer Africa Ltd.
9. Kenya Oil Ltd.
10. Mumias Sugar Company Ltd.
11. Unga Group Ltd.
12. Bamburi Cement Ltd.
13. Crown berger (K) Ltd.
14. E.A Portland Cement Co. Ltd.
15. Kenya Power & Lighting Co. Ltd.
16. Total Kenya Ltd.
17. Eveready East Africa Ltd.
18. Kengen Ltd.

Alternative Investments Markets Segment (AIMS)
1. A. Baumann and Company Ltd.
2. Citytrust Ltd.
3. Eaagads Ltd
4. Express Kenya Ltd.
5. Kapchorua Tea Co. Ltd.
6. Kenya Orchards
7. Williamson Tea Kenya Ltd
8. Limuru Tea Co. Ltd.
### Appendix 2: Matched Control Firms based on P/E ratios as at 26-Oct-2007

<table>
<thead>
<tr>
<th>Sample Firm</th>
<th>Share Price</th>
<th>P/E</th>
<th>Control Firm</th>
<th>Share Price</th>
<th>P/E</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.A Cables</td>
<td>42.75</td>
<td>25.30</td>
<td>Athi River Mining</td>
<td>90.00</td>
<td>25.20</td>
</tr>
<tr>
<td>Barclays Bank</td>
<td>72.00</td>
<td>20.10</td>
<td>Diamond Trust</td>
<td>92.50</td>
<td>20.50</td>
</tr>
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## Appendix 4: Control Firms Residuals

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