EFFECTS OF INCLUSION IN NSE 20 SHARE INDEX ON FIRM'S SHARE MARKET PERFORMANCE
(A CASE OF MUMIAS SUGAR CO. LTD)

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DECLARATION AND APPROVAL

Declaration

This project is my original work and to the best of my knowledge has not been presented for examination for any degree in any University.

Signature …….. Date ……..

Okode Martin Opiyo

(CMII/0638/10)

Supervisor's Approval

The research project has been submitted for examination with my approval as the University Supervisor.

Signature …….. Date ……..

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DEDICATION

Dedicated to my daughter Idah Achieng Okode and beloved wife Hellen Okode.

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ABSTRACT

The stock market is one of the most closely observed economic phenomenons in the world. Performance of a stock market is gauged on stock index, which also depends on performance of individual constituent stock. Therefore, stock inclusion in an index affects the stock, the index and the market at large. The argument that a stock's inclusion in an index results in a share price increase was observed quite a long time ago in developed stock market index. However in frontier markets, especially Kenya, this phenomenon has not been adequately addressed. The aim of the study was to evaluate effects of inclusion in NSE 20 share index on firm's share market performance. Specific objectives were; to determine effects of inclusion in NSE 20 share index on firm's share return and, to establish effects of inclusion in NSE 20 share index on firm's share market turnover. The study adopted an event study research design. Purposive sampling method was used to select only Mumias Sugar Company Ltd. for analysis from the target population of NSE 20 share index constituent companies. Secondary data from Nairobi Securities Exchange was analysis with the aid of STATA statistical package. Regression and correlation models together with parametric tests statistics (z-test) was used to analyse and test the hypothesis. Findings were presented using frequency tables, percentages, pie charts and graphs. The study found that Mumias Sugar Co. Ltd stock showed a rise in *ARs* towards index inclusion announcement, negative *ARs* towards the inclusion date and a low post inclusion *ARs* volatility. With stock turnover, the study found that the stock reported a drop in turnover ratio towards the announcement and inclusion dates but rose gradually after inclusion. Additionally, the stock yielded insignificant rise in share's market price performance and significant change in market trading volume. The study concluded that index inclusion has a general positive effect on affected stock through rise in price (approximately 4.05%), insignificance rise in abnormal returns and significance increase in liquidity within the short-run period in a frontier capital market. The study recommended that stocks added to blue chips indices are viable investment options as they exhibit an above average return in the short-run. However, these returns are insignificance and thus cannot warranty speculative investment strategy when transaction cost are captured. The simple buy-and-hold strategy is the best due to exhibited upward trends in cumulative stock returns. Lastly, the study suggests further studies on effects of deletion from index on firms market share performance.

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LIST OF ACRONYMS AND ABBREVIATIONS

AR	- Abnormal Return
AAR	- Average Abnormal Return
AIMS	- Alternative Investments Market Segment
CBK	- Central Bank of Kenya
CAPM	- Capital Asset Pricing Model
CDS	- Central Depository System
CEE	- Central and East Europe1
CLT	- Central Limit Theorem
Co.	- Company
DSDC	- Downward Sloping Demand Curve
EMH	- Efficient Market Hypothesis
FISMS	- Fixed Income Securities Market Segment
GEMS	- Growth Enterprise Market Segment
IFC	- International Finance Cooperation
IRH	- Investor Recognition Hypothesis
Ltd.	- Limited Company
MIMS	- Main Investments Market Segment
PPH	- Price Pressure Hypothesis
STATA	- Statistical Packages
STI	- Straits Times Index

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The Stock Market is one of the most closely observed economic phenomenons in the world. Market indicators meet the demand for measures of stock market performance. Such indicators quantify movements in stock market prices, and act as a standard in evaluating the returns on money invested in the stock market. Stock market indices as aggregate measure are instruments or platform to meet the information requirement of investors by characterizing the development of global markets and specified market segments or sectors (Amenc & Goltz, 2006).

A stock index is a measure of performance of a group of stocks which may be seen as a representative of a stock market. This can be either the whole market or even a segment of the market. According to Redhead (2003), indexes vary in type from regional, industry specific, national and even global. Indexes are also calculated for various instruments such as bonds, futures, and even real estate investments, thus they can be modified to meet certain information needs. With the advent and growth of indices, there have been various products such as index funds (exchange-traded or not), options and futures which with direct links to indexes and do represent large industries of in the market and themselves (ibid).

According to Philips and Kaplan (2005), the earliest indices were designed 'to gauge the market's general direction'. One of the first indices was the Dow Jones Industrial Average (DJIA) Index, which initially tracked 19 industry stocks. It was designed in the late 19th century by Charles Dow. It used a simple arithmetic construction which is the basis for many indexes including the Nairobi Securities Exchange (NSE) 20 share Index. As technology improved, market gauges have moved from very basic indexes to broader market measures, such as S&P 500, and higher quality measures of the full market e.g. Wilshire 5000, NSE All share Index among others.

The inherent inability of the older index to satisfy investors has led to construction of new indices. Old indexes were good for just tracking the market and thus could not meet various

demands from investors who had different investment styles and objectives such as superior portfolio return. New indexes varied from 'one-factor and two-factors models to more complex six-to-nine factors model such as Salomon Smith Barney index and Dow Jones Industries index (Philips & Kaplan, 2005).

In addition, factors in new indexes vary from the basic price and shares sold to things like earnings per share, dividends, tax and a variety of other factors. The main aim is usually to have more than one shoe fits all indexes so that investors can be able to get a 'greater' understanding of the market. Currently a third generation of indices is being designed to create a better reflection to the underlying market mechanism. These fundamentally weighted indices are currently being put to test by various researchers.

Stock indexes as a standard market gauge do affects stock performance. The argument that a stock's inclusion in an index results in a share price increase was observed quite a long time ago in developed stock market index. However, this according to the postulates of Efficient Market Hypothesis (EMH) could be regarded as market anomaly. Fama (1970) observed that asset prices should incorporate all information required for their accurate pricing and therefore changes in the composition of stock market indexes should not have any significant effects on the prices and trading volumes of the affected stocks. This study shades light on this issue with regards to index inclusion in a frontier market.

1.1.2 Nairobi Securities Exchange (NSE)

The Nairobi Stock Exchange (NSE) - formerly Nairobi Stock Exchange - has a long history that can be traced to the 1920's when it started trading in shares while Kenya was still a British colony (IFC/CBK, 1984). While share trading was initially conducted in an informal market, there was a growing desire to have a formal market that would facilitate access to long-term capital by private enterprises and allow commencement of floating of local registered Government loans (Ngugi, 2003). This led to the constitution of NSE in 1954 as a voluntary association of stockbrokers registered under the Societies Act (NSE, 1997). The newly established stock exchange was charged with the responsibility of developing the stock market and regulating trading activities.

Since its inception, various development have been made to date such as introducing of online brokerage, accounts changing from paper based to online through introduction of the

Central Depository System (CDS), longer trading periods between 10:00 am and 3:00 pm among others. All this has been done with the aim of enhancing exchange efficiency within the ever-growing financial sector in both pricing and trade volume as more investors and companies joining the exchange via initial public offerings. There has also been an increase of bond trading activity as companies seek to float short-term notes and debentures (NSE, 2013). Currently, Nairobi Security Exchange has 19 member firms or stockbrokers. (www.nse.co.ke).

In July 2011, the Nairobi Stock Exchange Limited, changed its name to the Nairobi Securities Exchange Limited. The change of name reflected the strategic plan of the Nairobi Securities Exchange to evolve into a full service securities exchange that supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments (NSE, 2011). The exchange currently (July 2013) has 52 listed firms drawn from all sectors of economy and classified in to market segments. According to NSE Listing Manual (2010), NSE market is divided in to the following segments; Main Investments Market Segment (MIMS), Alternative Investments Market Segment (AIMS) and Fixed Income Securities Market Segment (FISMS).

More recently, the NSE launches the Growth Enterprise Market Segment (GEMS) on 22 January 2013 (NSE, 2013) and listed Home Afrika Limited, as the first company, on 15 July 2013 (NSE, 3013b). Requirements for listing in any market segment can be obtained from NSE Listing Manual (2010) and NSE Press Release (2013b). NSE also manages the following stock indices; NSE All share index, NSE 20 share index, FTSE NSE Kenya 15 Index, FTSE NSE Kenya 25 Index, FTSE NSE Kenya Govt. Bond Index, FTSE ASEA Pan African Index (www.nse.co.ke)

1.1.3 NSE 20 Share Index, Constituents Companies and Index Reviews

The NSE 20 Share index is a market-capitalization weighted index for the Nairobi Securities Exchange. It was established in 1966 to by Nairobi Securities Exchange Ltd (then Nairobi Stock Exchange) to reflects daily prices of the 20 blue-chips (superior profitability and dividend record) companies (NSE, 2010b). These companies are drawn from the three sectors of market namely the Main Investments Market Segment (MIMS), Alternative Investments Market Segment (AIMS) and Fixed Income Securities Market Segment (FISMS), and

account for 70% of the capitalization of the Nairobi Securities Exchange. The slot is allocated to markets/sectors as follows; Agricultural sector 2, Finance 5, Commerce 4, Industries 5 and AIMS 1 totalling to 20 companies (NSE, 2010b).

In order for a company to qualify for inclusion in the Index, it should meets the following conditions: (i) must have at least 20% of its free float available for trading at the NSE, (ii) must have been continuously quoted for a least 1 year, (iii) must have a minimum market capitalization of Kshs 50 million, (iv) Should ideally be a "blue chip" superior profitability and dividend record and (v) Shares must have their primary listing on the Nairobi Securities Exchange. Over and above the listed criterions, market capitalization is the underlying criteria for inclusion in the index if companies fulfil all other inclusion requirements (NSE, 2010b).

Periodic reviews of constituent companies of the NSE 20 share index is done on a quarterly basis by the index management sub-committee. The reviews is based on data collected for a period of one year as at the end of each quarter, and details of the outcome of the review are published as soon as possible after recommendations of the Index Management Sub-Committee have been endorsed by the Trading Committee and ratified by the Board. However, the change for the constituent companies are initiated and implemented as soon and when need arises (NSE, 2012).

Changes to constituent companies for inclusion/deletion are initiated in any of the following circumstances. First, a constituent company is delisted, if it ceases to have a firm quotation, or is subject to a takeover offer that has been declared wholly unconditional, or has in the opinion of the index management sub-committee, ceases to be a viable constituent as defined by the ground rules. Conversely, in cases of mergers, restructuring and complex takeovers, if the effect of a merger or takeover is that one constituent is absorbed by another constituent, a vacancy is created in the index. However, if constituent company is taken over by a non-constituent company, the original constituent will be removed and replaced by the merged entity (NSE, 2012).

In the event of new issue, if a new issue is so large that the effectiveness of the index as a market indicator would be significantly and adversely affected by its omission, the sub-committee may recommend to the trading and compliance committee for its inclusion before

the lapse of the one year clause (ibid). Summary of NSE 20 share index constituents' companies review from the year 2000 to 2012 is attached as Appendix III

1.1.4 Inclusion of Mumius Sugar Company Shares into NSE 20 Share Index

Mumias Sugar Company was incorporated on 29th June 1971 following the Government adoption of a feasibility study carried out by a Bookers Agriculture and Technical Services, a subsidiary of Booker McConnell (which is now BTL). At incorporation, the majority shareholding was the Government (70.76%) and minority interests held by the DCE (17.18%), KCFdC (5%), Booker McConnell (4.41%), and the EADB (2.65%). However, the Company produced the first sugar in 1973 (MSC, 2013)

Since its first production, the company has experience tremendous growth and expansion to become the industry giant controlling over 60% of the market. It has also diversified into power production, water and ethanol production (MSC, 2013). Milling capacity has expanded from 80 tons of cane per hour to 125 tons of cane per hour in 1976, to 300 tons of cane per hour in 1979 and a major expansion of the factory in 1985 resulting to a potential capacity of 210,000 tons of sugar per year. The company currently produces 34 MW of electricity, 42 million litres of water and 22 million litres of ethanol per annum (www.msc.co.ke).

In 2001, the company was converted from a private to a public company and listing on the Nairobi Stock Exchange (NSE) under Industrial and Allied sector of Main Market Segment and. Six years later, the company become a constituent company of NSE 20 Share Index on 1 August 2007 (NSE, 2007). The announcement of inclusion was made on 20 July 2007 during the major NSE 20 Share Index Review that dropped six companies from its 20 share index constituent stocks and included new ones to reflect changes in market fundamentals since May 2003 when the index was last reviewed. The dropped companies were NIC Bank, BOC Gases, Unilever, Kakuzi, Uchumi Supermarkets and Williamson Tea. They were replaced by ICDC Investments, KenGen, Mumias Sugar, Rea Vipingo, Cooper Motors Corporation (CMC) and Express Ltd (ibid).

The choice of Mumias Sugar Company as study case is arrived at following the long lapse of time between subsequent index reviews (May 2003 and Jully2007) and the wide gap between dates of review and inclusion on 20 July 2007 and 1 October 2007 respectively. This gap can

be ideal for testing of information content in the market. Since then, Mumias Sugar Company has remains a constituent company in NSE 20 Share Index.

1.2 Statement of the Problem

The existence of positive returns for benchmark index inclusion has dominated empirical literature. Studies such as Sadeghi (2011), Bankovica and Praņevics (2007), Hacibedel and Bommel (2006), Madhavan (2002), Lynch and Mendenhall (1997), Chen, Noronha and Singal (2004) have found permanent and significance price and/or volume effects while others studies; Shankar and Randhawa (2006), Kaul, Mehrotra and Morck (2000) have found temporal and significance price and/or volume effects. This has resulted on disagreement on the possibility of abnormal returns for stocks included in blue chip indices. In Kenya, several proxies e.g. earnings and dividends (Kimani, 2013) IPOs and right issues (Gatheri, Oluoch & Mugo, 2014) political (Nyamweya, Mwangi & Kimani, 2014) and other economic events) have been used to assess stock market reaction to the arrival of news. However, effect of index reviews (inclusions), as an event, has not been assessed on firm's share market performance. Therefore, the study aimed to fill this important knowledge gap.

1.3 Objectives of the Study

The general objective of the study was to evaluate effects of inclusion in NSE 20 share index on firm's share market performance.

1.3.1 Specific Objectives

i. To determine effects of inclusion in NSE 20 share index on firm's share return.
ii. To establish effects of inclusion in NSE 20 share index on firm's share market turnover.

1.4 Research Hypothesis

H_{o1}: There is no effect of inclusion in NSE 20 share index on firm's share return.

H_{o2}: There is no effect of inclusion in NSE 20 share index on firm's share market turnover.

1.5 Significance of the Study

In recent years, many investors have given up the quest for superior performance and have instead simply sought to match the returns on some broad market index. As the main instrument used to reflect the overall behaviour of the market, stock index performance and its ability to adjust and reflect the market is vital to investors in order to fairly price stock.

Therefore, the findings of this study could be useful to investors, as it revealed how index reviews affects stock market performance.

The policy makers, Capital Market Authority (CMA) and NSE, can also benefits from the finding by designing and redesigning index regulations according to the expected trend following reviews to mitigates market manipulation and extreme anomalies.

Last but not least, the study will also contributes to furtherance of academic. Since it focused on frontier and less integrated market, it not only contributes to the existing index reconstruction literature, but also extends it to the frontier market context and highlight how reviews of frontier blue chip indices affect stock market performance.

1.6 Scope of the Study

The gist of this study is on market efficiency with specific evaluation of how index inclusion transmits information to the market. The information content was analysed on stock market performance. .

1.7 Limitations and Delimitations of the Study

The study used NSE 20 share index to compute market model parameters - used to estimate stock returns over the study period. The use of this benchmark stock index might have some limitations as it only capture 20 most traded companies in the market. However, this did not have serious draw back on the study as NSE 20 share index gives a good representation of the market and accounts for over 70% of market capitalization. The data was also readily available as opposed to dealing with individual company.

1.8 Operational Definitions of Terms

Stock Index

This is a measure of performance of a group of stocks which may be seen as a representative of a stock market, either as a whole market or a segment of the market.

Index Review/Reconstruction

This is the reconstitution or change of index composition through deletion of existing stock and inclusion of new stock to the index.

Event Study Analysis

This is the measure of the impact of specific events on the value of a firm. Its widely used for analyzing market efficiency and impact on share price of different specific events like

announcements of earnings, mergers and acquisitions, stock splits as well as inclusion in or deletion from an index.

Price Pressure

This is the upwards/downward drive of stock prices due to reduction/increase in required rate of return as a results of increase liquidity of stock.

Information Content

This is a change in expectations about the outcome of the event. In the case of an index inclusion, the event is said to have information content if it results in a change of investor's assessments of the probability distribution of future returns in a way that there is a change in the current equilibrium market price.

Stock Liquidity

This is the ease with which an investment assets (stocks) can be converted into cash, in a short period of time, without a significance decrease in its price or value.

Stock Return

This is the discount rate which equits the present value of the dividend streams and ending price with the purchase price.

Stock Market Turnover Ratio

This is the daily traded stocks of a particular company divided by its free float or total number of outstanding shares.

Market Capitalization

Market capitalizations as the total value of shares traded multiplied by their prices i.e. the value of listed domestic shares on the country exchanges.

Efficient Market Hypothesis (EMH)

This theory states that the prices of securities fully reflect the available information, therefore stock always trade at their fair value on stock exchanges, making it impossible for investors to either purchase undervalued stock or sell stocks for inflated prices.

NSE 20 Share Index

The Index is a market-capitalization weighted index for the Nairobi Securities Exchange**.** It represents an equi-weighted geometric means of 20 large ordinary stocks traded on the Nairobi Securities Exchange.

Anomalies

Security price relationships that appears to contradict a well-regarded Efficient market Hypothesis

Frontier Market

This is a less advanced capital market or financial market from developing countries. They are pre-emerging markets and less established than those in emerging markets.

Market Return

This is the performance return for NSE 20 share index as a representation of the whole NSE return calculated as natural logarithm difference of the index at time $_{t}$ and time $_{t-1}$

CHAPTER TWO

LITERATURE REVIEW

2.1 Stock Market Index Reviews

The event of index inclusion may result in the two types of price impacts. There may be only short-term price effects, which are temporary, and which occur around and between the announcement and the index inclusion. Following the inclusion, this effect does not persist. The short-term effects are consistent with the demand-based hypotheses, i.e. the demand curve is downward sloped in the short run, but horizontal in the long run as seen in most reviews in developed markets. In other words, the stock prices are less elastic in the short run.

On the other hand, the index inclusion may have permanent (long-term) price effects. In this case, in addition to the price movements in the short run caused by the changes in the aggregate demand, the index inclusion also has information (positive) content about the fundamental value of the stock. Therefore, the price effects persist even after the actual index inclusion, i.e. slight or no price reversal. However, if markets are fully integrated, in the sense that all the world's investors consider all the world's stocks for their portfolio decisions, and markets are efficient in the semi-strong sense, then there should be no permanent effect if a stock is included in an benchmarking index. The following theories shade light on stock reaction to market information.

2.2 Theoretical Literature Review

Several hypotheses have been proposed to explain the price and volume effects in response to the inclusion or deletion of individual stocks from market indexes. All these hypotheses have been proposed within the context of changes in developed US market indexes, and have almost exclusively examined changes in the S&P 500 index.

2.2.1 Downward Sloping Demand Curve (DSDC)/Price Pressure Hypothesis (PPH)

Embedded in the downward sloping demand curve and the price-pressure hypothesis is the assumption that inclusion of a share into an index is an 'information-free' event as addition (or deletion) of stock from index does not reflect an opinion on the firm's earnings prospects. In addition, stocks have perfect or near perfect substitutes while investors do have preferences for local stocks to regional and international companies. Shleifer (1986) contends that the absence of perfect substitutes for shares results in downward sloping demand curves

as investors are price sensitive and demand a premium to substitute their holdings for less 'desirable' stocks.

However, the abnormal return may be caused by changes in the aggregate demand which may results to a permanent or temporal price effect. The temporary price pressure hypothesis posits that inclusion of a share leads to increased demand for that share by funds managers tracking the index. Conversely when a share is deleted from the index, demand falls leading to a fall in the price. In efficient markets, other buyers/sellers will step in to absorb the excess demand/supply and, in the absence of any other information, the price effects should be temporary (Hacibedel and Bommel, 2006).

2.2.2 Certification / Information Hypothesis:

The second set of hypotheses assumes that index changes, indeed, have information content. As an information event, the index change transmits new information about the firms to the market, which results in a revaluation of the stock price. Certification hypothesis, suggested by Jain (1987) claims that index inclusions convey positive information about the stocks, so inclusion or deletion by a major benchmark index signals to the market that it has some private information about the specific stock unknown to the market. This hypothesis also requires the price reactions to be symmetric for additions and deletions. Dhillon and Johnson (1991) added that certification also results in increase in expected future cash flows, thus affecting the pricing of a stock.

The information-content hypothesis explanations to the significant average returns is also valid within the Standard Valuation Model (Gordon, 1962) that shows that the present stock price of a firm is equal to the discounted future cash flows. The revaluation of the stock price then stems either on the change in expected cash flows or on a change in the required rate of return (i.e. the discount rate).

As explained in Chen, Norohna and Singal (2004), increases in expected future cash flows can occur because of at least 3 reasons: certification, enhanced investor awareness resulting in higher expected future cash flows, and enhanced investor awareness resulting in better monitoring and more successful investment decisions. Similarly, decrease in required return can accompany an index addition for several reasons: (i) higher liquidity due to higher

trading volume, (ii) greater interest in the added stocks as a result of reduced information asymmetry, and (iii) increased investors awareness due to decrease in shadow cost.

2.2.3 Investor Recognition Hypothesis (IRH),

Investor recognition hypothesis (IRH), suggested by Merton (1987), articulates that the index inclusions are associated with 'increase investor awareness' and decrease in shadow cost. In the context of index inclusion, IRH can be interpreted as following; when a stock is added to the index, more investors become aware and hold it for its diversification benefits. As a result, the shadow cost falls and there is a permanent increase in the stock price. This hypothesis does not require the price effects to be symmetric, since the index deletions would not necessarily mean investors becoming unaware of the stock. In the previous empirical studies (e.g Kadlec & McConell, 1994), number of shareholders, number of institutional investors and institutional stockholdings have been used as proxies to measure investor awareness.

2.3 Empirical Literature Review

2.3.1 Effect of Index Inclusion on Firm's Share Return

Considerable research efforts have been devoted to determine whether indeed reviews (index inclusion) has impact on stock market price and trading volume. To commence with, Sadeghi (2011) investigated the impacts of index additions on the return and liquidity of Shariah-compliant shares in Egypt and Jordan using sample of companies added to Dow Jones Islamic Market Index over the period of January 2008–December 2009. His finding shows that stock prices and returns respond positively to index addition events in both countries. Furthermore, the study provided evidence in support of long-term increases in the returns and liquidity of added shares. These results are consistent with results from conventional index addition studies. The study findings have important implications for Shariah-compliant investors, as they show that companies whose activities reflect the beliefs and ethos of their investors in the Middle East are also attractive for investment.

Study by Bankovica and Praņevics (2007) titled 'How does inclusion in an index affect stock prices' to examine whether a stock's inclusion in a blue chip index in the Central and East Europe (CEE) countries yields abnormal returns. The study analysed whether the inclusion or the announcement of inclusion contains information previously unknown to the market.

Applying the standard event study methodology on daily trading data from years 2000 to 2006, findings show that significant abnormal returns are present on the announcement day and investments in these stocks would earn on average 5.1% over the subsequent month. In addition, both events (the announcement of inclusion and the actual inclusion itself) contain new information, which was observable through significant increase in volatilities of the stocks. This effect was stronger for the announcements than for the actual inclusions as volatility starts to increase a few days before the respective event. The findings show that it is possible to earn abnormal returns in the CEE markets when a stock is included in a blue chip index.

In a study conducted at MSCI frontier market by Hacibedel and Bommel (2006) to analyze the impacts of index inclusions in frontier markets by assessing 269 stocks from 24 countries that were added to the index over the period 1996-2004. They find a convincing evidence of positive permanent price impacts, which can be explained by the characteristics of these markets, upon index inclusion. They attribute this to the *radar screen effect* (Merton, 1987), which predicts that more visible stocks attract more investors and hence require lower expected returns. According to their findings, in the short run, the price response to inclusions and deletions are asymmetric and much higher in the latter case. This is somehow similar to the index inclusion effects in the mature markets, though the magnitude of abnormal returns around the inclusions and deletions were different. In the long-term, there was a permanent price impact with a slight reversal following the actual index inclusion. The study suggests two alternative hypotheses to explain this; mild-segmentation of the frontier markets with the world markets and the changes in stock liquidity, which in return results in changes in expected returns and in stock price revaluations. However, the study did not find any supporting evidence for the change of liquidity across stocks.

Similar results were also obtained by Madhavan (2002) in his study 'Index reconstitution and equity returns.' The findings document significant abnormal returns around the annual reconstitution of the Russell 2000 and 3000 indexes from 1996-2001. Specifically, stocks projected to be index additions experience positive abnormal returns in June and the abnormal return reversals in July. This finding suggests that a significant portion of these excess returns was due to price pressure, with the remainder attributable to permanent changes in liquidity. The results shown that investors would experience higher net returns (with some risk of tracking error) when they trade ahead of the reconstitution based on

predictions of index additions or deletions. The study concluded by point to the importance of understanding implicit transaction costs associated with demanding liquidity at specific points in time, and at a broader level, the relationship between liquidity and stock prices.

In a comparable study, Shankar and Randhawa (2006) examine the price and volume effects on stocks involved in changes in the Hang Seng Index (HIS) of Hong Kong and the Straits Times Index (STI) of Singapore. Using a sample of 33 stocks added to HSI from 1990 to 2004 and the STI from 1998 to 2004, for a period of at least 280 days before announcement and 280 days after the effective day. The findings revealed that stocks added to the HSI shows significantly positive returns at announcement but these returns are subsequently reversed within 10 days after the effective day. Furthermore, there was a significant decline in prices on the announcement day, but within ten days of the effective day, the cumulative returns were not statistically significant.

For STI additions, the study did not find any significant reaction on the announcement day. In the subsequent periods also, the returns were not substantial. This they attributes to fact that STI index does not have a large index fund following thus no large price reactions. This findings leads to the conclusion that the price effects noted with other index additions may result largely from the demand-supply disequilibrium caused by index mutual fund trackers, rather than new information or certification signalled by index inclusion. In addition, alternatively, it is also possible that in markets like Singapore and Hong Kong where the number of securities traded is relatively small, the information or certification signalled by index inclusion is not significant, since market participants are aware of the prospects for these firms even before index inclusion.

According to Howard and Chan (2002) several studies have reported significant price effects associated with changes in the composition of market indices, particularly the S&P 500. Over the period 1976 to 1988 when Standard and Poor's announced and implemented changes in the index sample simultaneously, additions were associated with an average abnormal return of approximately 3% on the first trading day after the change. The majority of studies found that the price changes were sustained over subsequent trading days. Since October 1989 when Standard and Poor's has generally announced index changes a week in advance, the price response is larger.

Lynch and Mendenhall (1997) examine the effects of additions and deletions on S&P500 on the stock price over the 1976-1995 periods. Their results show that there is a permanent stock price increase vis-à-vis stock return after the announcement and the inclusion. This finding is inconsistent with the efficient markets hypothesis (EMH), particularly with the semi-strong form of efficiency, since the event-induced abnormal returns show that profits cannot be made based on publicly available information. The authors explain the observed stock return behaviour via four competing hypotheses in the literature: price pressure, DSDC, information and liquidity hypotheses. Their findings support the first two hypotheses while no supporting evidence is found for the last two.

Denis, McConell, Ovtchinnikov and Yu (2003) study the additions to S&P500 between 1987 and 1999, and tested whether the index addition is an information free event. Their results support the hypothesis that index inclusions are not information free events, and show that they actually have positive information. They do not totally reject the DSDC, but show that this information content must be accounted for in the demand curve based analyses of the index additions.

Chen, Noronha and Singal (2004) study the price effects of S&P500 changes between 1962 and 2000. They find asymmetric price reactions following additions and deletions. They compare their results with those in earlier studies, and find that the investor awareness is a better explanation of the phenomenon than the explanation based on the demand curve, liquidity and decreased operational costs. In general, they find a permanent price effect (increase) for the additions and a temporary price effect (decrease) for the deletions.

2.3.2 Effect of Index Inclusion on Firm's Share Market Turnover

A change in the composition of stock market indexes have been argued to cause an effect on trading volumes of affected stocks. Harris and Gurel (1986) provided empirical evidence in support of increased trading volume following index inclusion. His study, which examines strategy of buying the newly included stocks into S&P 500 index the next day following the announcement and selling them at a higher price afterwards for period covering 1973 - 1983. The study found an increase in trading volume and trading size following the announcement and subsequent inclusion of stock into index. Furthermore, a decrease in the quoted bid/ask spread of the newly included stocks was also observable. Their finding showed that trading volume increases permanently, while the effects on trade size and bid/ask spread were only

temporal. In general, the post announcement price increased by 4.4%, and abnormal profit could be earned using the above mentioned strategy.

Study by Bankovica and Praņevics (2007) titled 'How does inclusion in an index affect stock prices' to examine whether a stock's inclusion in a blue chip index in the Central and East Europe (CEE) countries yields abnormal returns and abnormal trading. The study found that both events (the announcement of inclusion and the actual inclusion itself) contained new information, which was observable through significant increase in volatilities of the stocks. This effect was stronger for the announcements than for the actual inclusions as volatility starts to increase a few days before the respective event. They concluded that it is possible to earn abnormal returns from abnormal trading in the CEE markets when a stock is included in a blue chip index.

In a comparable study, Shankar and Randhawa (2006) examine the price and volume effects on stocks involved in changes in the Hang Seng Index (HIS) of Hong Kong and the Straits Times Index (STI) of Singapore. Their findings revealed that stocks added to the HSI shows significantly trends in the abnormal trading volume which showed a spike around the announcement and effective days, but reverts to normal in the post-effective day period.

Kaul, Mehrotra and Morck (2000) examine the effects of changes in the weights of stocks included in the Toronto Stock Exchange index from market-cap based to free-float based weights. They found evidence of significant trade volume increases during the event week; however, trading volume returned to normal levels after the event following price reversal. Studies of smaller markets ware carried out in Canada by Masse et al (2000) to test two explanations of stock price adjustments – the Efficient Market Hypothesis and increased demand by institutional purchasers. They find that stock trading volume respond positively to inclusion, outperforming market by 4.29%. What is more, they find evidence of information leakage – as stock prices vis-à-vis trade volume started adjusting before any announcement of inclusion was made.

Bildik and Gulay (2001) test changes in index composition for the Istanbul stock exchange and find stocks included in the ISE-100 and ISE-30 generate positive returns. They speculate that the absence of index funds tracking the indexes appears to result in the effects being much smaller than in other markets; they also find significant increase in trading volumes

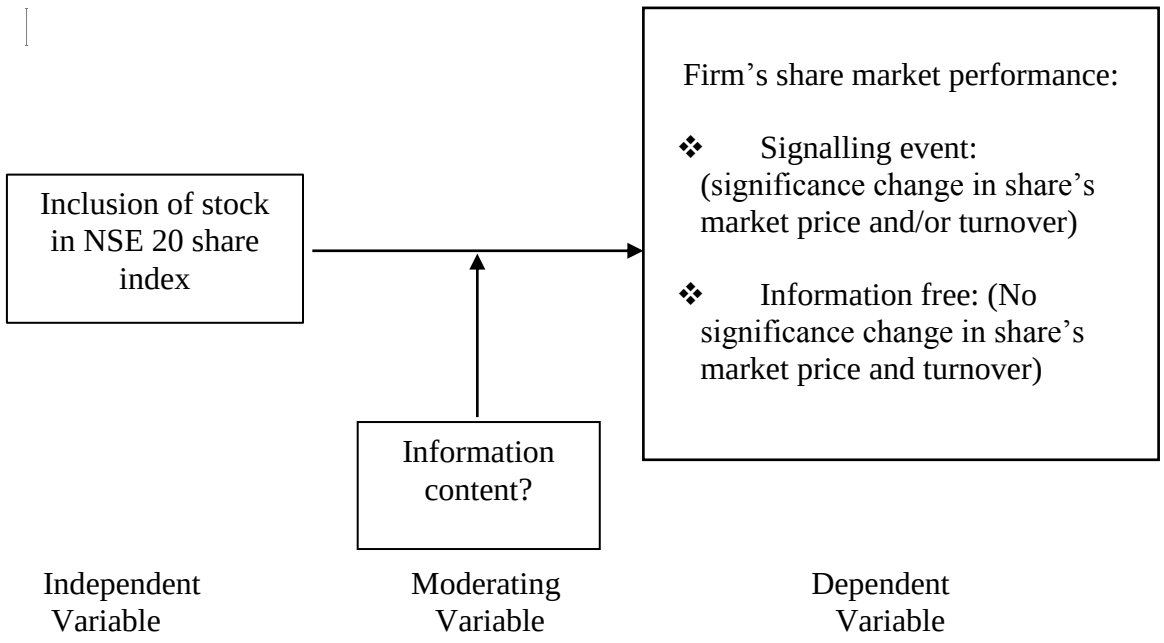
after the event. Other past studies have found also changes in the trading volume of stock affected by index reconstruction e. g Beneish and Whaley (1996), Chordia (2001) and Hegde and McDermott (2003) have found evidence of a permanent increase in liquidity of stocks added to the index.

2.3 Summary Literature Review and Research Gap

The reviewed literature revealed that index inclusion has effects on stock market share performance through investors change in expectations about the outcome of the event. As seen from reviewed literature. Index inclusion transmits information if it results in a change of investor's assessments of the probability distribution of future returns in a way that there is a significant change in the current equilibrium market performance. This results in a revaluation of the stock price and trade volume due to increased awareness of stock which reduces information asymmetry and increases liquidity hence lower expected returns and raises stock price. This performance association have been studied from index inclusions in developed market (Shleifer, 1986; Harris and Gurel, 1986; Shankar and Randthawar, 2006). However in frontier and emerging markets, minimal emphasis have been placed. Particularly in Kenya, no study was reviewed that assess the effect of index inclusion. Therefore, the study filled this important knowledge gap.

2.4 Conceptual Framework

Figure 2.1: The Conceptual Framework



Source: Researcher (2014)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The study adopted an event study research design, as advocated by Fama (1991) and MacKinlay (2007). Event study design provides a better way of evaluating the magnitude of movement over time of a specific event on the value of a firm with the use of financial market data, thus gives a clear picture of the speed of adjustments of prices to information in the context of the stock exchange.

3.2 Target Population

The target population of the study comprised the companies that constitute the NSE 20 share index (see Appendix I).

3.3 Sampling Procedure and Sample Size

The study employed both purposive sampling and simple random sampling methods. The non-probabilistic purposive sampling method was used to select 2007 NSE 20 index review from all reviews between 2000 and 2013. This choice of 2007 review was based on its distinct scenario from other index reviews. That is, long subsequent reviews time (three years), wide gap between announcement date and inclusion date (eight trading days), and the number of companies affected (six company stocks), compared to other index reviews done on annual basis with announcement and inclusion gap relatively a week apart. Simple random sampling method was used to select Mumias Sugar Co. Ltd for analysis from the affected stocks in that particular review.

3.4 Data Collection Procedures

The study used secondary data obtained from NSE daily trading results for the entire study period. Collected data included; NSE 20 share index reviews announcement and inclusion dates, daily closing prices and trade volumes for NSE 20 share index constituent companies and Mumias Sugar Co. Ltd. Where necessary, closing stock prices was adjusted for dividends and changes in capital structure & trading pattern, specifically xd-dividend and ex-all trading patterns.

3.5 Data Analysis and Presentation

The study employed descriptive statistics to analyse data. Statistical analysis (STATA) program was utilized and z-test statistics ware conducted on the share returns and trading volumes over the event window to determine whether there was significant effect on share price and trading volume on stock inclusion in index. Study results and findings are presented in the form of frequency tables, percentages, pie charts and graphs with detailed explanation thereafter.

3.5.1 Model Specification

The study adopted a market model which provides a linear specification of the return of the given stock to the return of the market portfolio. This model is preferable because it reduces the variance of abnormal returns by removing the portion of the stock return that is related to variation in the market return, Adelegan (2009) and assumes that asset returns are normally distributed, MacKinlay (1997). Therefore, for stock *i* the normal returns was computed as follows:

$$R_{it} = \hat{\alpha} + \hat{\beta} R_{mt} + \varepsilon_{it}$$

Where:

R_{it} and R_{mt} are period *t* returns of stock *i* and market portfolio respectively, computed as $R = Ln(P_1/P_o)$

ε_{it} is the zero mean residual or error term

$\hat{\alpha}$, and $\hat{\beta}$ are estimated parameters of the model.

NB: stock expected return $E(R) = (\hat{\alpha} + \hat{\beta} * R_{mt})$

For the i^{th} firm in event time, the Ordinary Least Square Regression estimators of the market model parameters for an estimation window of observations were computed as follow;

$$\beta_i = \frac{\sum_{t=T+1}^{T}(R_{it} - \hat{\mu}_i)((R_{mt} - \hat{\mu}_m)}{\sum_{t=T+1}^{T}(R_{mt} - \hat{\mu}_m)^2}$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m$$

$$\hat{\sigma}_{\varepsilon_i} = \sum_{t=t+1}^{T} (R_{it} - \hat{\alpha} - \hat{\beta_1} R_{mt})$$

Where: μ_i and μ_m are the mean returns for both security *i* and market return respectively during period *t*. Hence, the abnormal return was the mean residual or error term computed as

stock i actual return minus its expected return [$\widehat{AR}_{it} = \left(\mathrm{R_{it}} - \hat{R}_{it}\right)$]. The cumulative abnormal returns (CAR), which measures investors' total return over a period starting from 21 days prior to and 21 days after index inclusion, was measured as below:-

$$CA\mathrm{R_i} = \sum_{t=1}^{t=j} A\,\mathrm{R_i}$$

Where: j denotes day t= -21 through to day t= +21

Stock market liquidity performance was analysed using turnover rate (Amihud, 2002). Turnover ratio takes into account the total number of shares of a particular company that are available for trading on a given day ('free-float') hence more desirable measure of liquidity. The turnover ratio (T_{ij}) was calculated as follows;

$$\mathrm{T_{ij}} = \frac{\mathrm{Q_{it}}}{\mathrm{V_{it}}}$$

Where:

V_{it} - denotes the daily number of shares outstanding for stock i

Q_{it} - is the number of shares of company i traded on day t (trading volume).

The average turnover rates for pre inclusion and post inclusion within event window was computed for significance analysis with parametric tests z-test statistics at 95% level of confidence.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Background Statistics

In order for the study to estimate stock returns within the event window, the researcher used market model which provides a linear specification of the return of the given stock to the return of the market portfolio. To begin with, the study employed OLS regression to approximate market model parameters. The values result for the market model parameters ware; $\hat{\beta}$ *= 0.516035* and $\hat{\alpha}$ *= -1.306474E-03*. From these parameters value of market model equation, estimated stock returns ($\hat{R}_{it}$) and abnormal returns ($\widehat{AR}_{it}$) was computed and attached as Appendix I and summarized in Table 4.1. The general performance, as shown in Table 4.1, revealed that market return was relatively stable with a mean of 0.000964, standard deviation of 0.0074, maximum and minimum returns of 0.0232 and -0.0206 respectively. The stock return vis-à-vis abnormal returns were relatively volatile. Stock return (R_{it}) had a mean of 0.000923, standard deviation of 0.0476, maximum and minimum returns of 0.3741 and -0.2649 respectively. Stock's abnormal returns (AR_{it}) had a mean of 0.000433, standard deviation of 0.0472, maximum and minimum returns of 0.1545 and -0.1133 respectively.

Table 4.1: Returns Descriptive Statistics around the Event Period

Item	Mean (μ)	Maximum	Minimum	StdDev (σ)
Market Return ($R_{m)}$	0.000964	0.0232	-0.0206	0.0074
Stock (R_i)	0.000923	0.3741	-0.2649	0.0476
Stock abnormal returns (AR_i)	0.000433	0.1545	-0.1133	0.0472

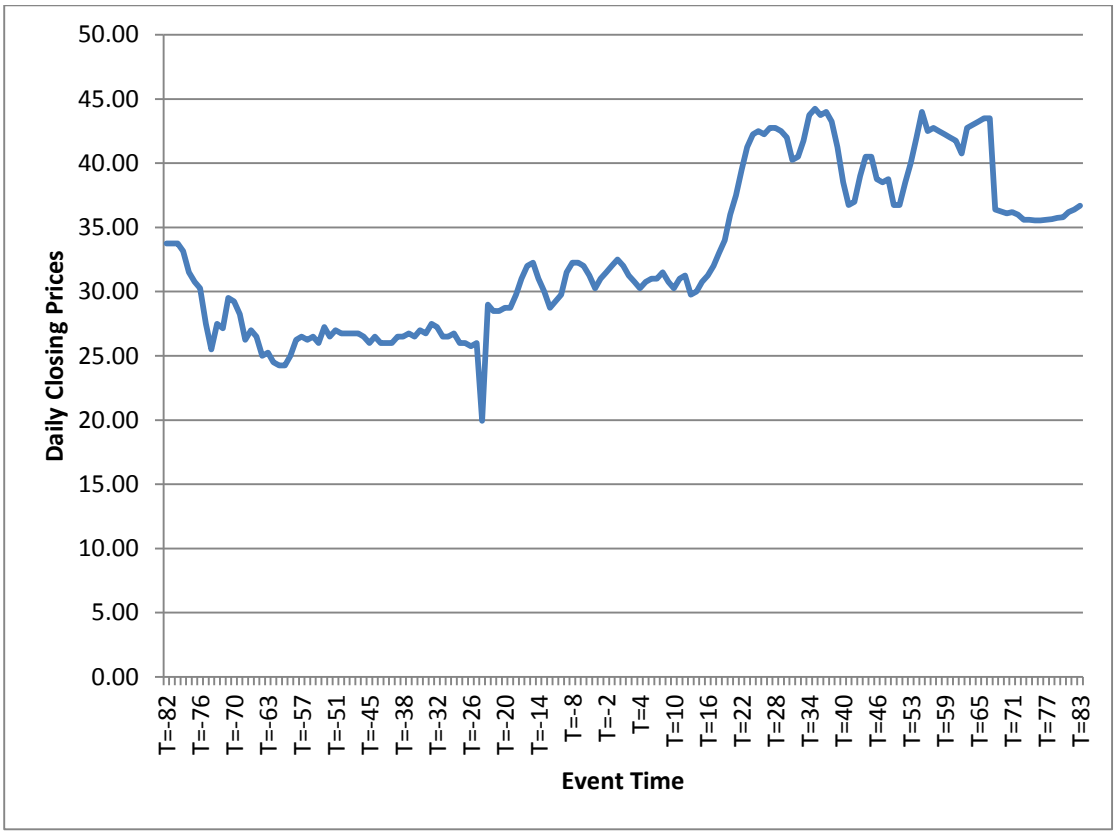
Source: Research Data

Findings in Table 4.1 indicates that, on average, Mumias Sugar Co. Ltd. relatively outperformed the market during the index review period, thus stock inclusion in index yields above market average return in the short-run period. This finding are supported by study finding of Bankovica and Praņevics (2007); Sadeghi (2011); Hacibedel and Bommel (2006); Madhavan (2002); Lynch and Mendenhall (1997); Chen et al (2004), all who found that stocks added to index do outperform market returns within the short-run period.

4.2 Effect of Index Inclusion on Firm Share Return

The study sought to establish the effect of index inclusion on firm's share returns within the event window. To achieve this, the study used daily closing prices of stock to estimate both pre inclusion returns and post inclusion returns within ±21 trading days. Study findings revealed that there was a general rise in price of stocks by approximately 4.05% following inclusion in index as depicted in Chart 4.2. Besides, on average pre inclusion announcement prices and post inclusion prices were Shs. 32.20 and Shs. 33.30 respectively within the event window. Study findings collaborated with Harris and Gurel (1986) who found a general rise in price of 4.4% for stocks added to S&P 500 index.

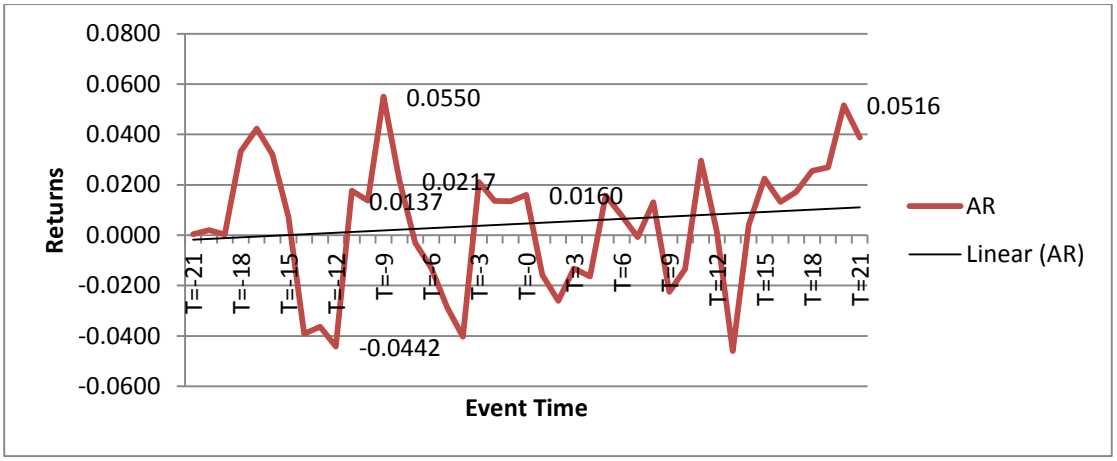
Figure 4.2: Daily Closing Prices for Mumias Sugar Co. Stock



Source: Research Data

A part from stock price findings, the results for computed and analysed stock returns within the event window are shown in Chart 4.3 below.

Figure 4.3: Abnormal Returns around the Event Window



Source: Study findings (2014)

Results in Chart 4.3 shows that on day t= -12 before the inclusion announcement, a rise in stock returns (*ARs)* was exhibited as *ARs* moved from -0.044 (t=-12) to 0.055 (t=-9). However on announcement day (t=-8), *ARs* dropped to 0.0217 but still positive. This would indicate that the market expected the stock to be included in the index, which might be a rather reasonable assumption. As the index, reviews procedure and criteria are within the public domain, some market participants (speculators) might have started buying anticipated stocks to be included in the index a few days before announcement raising stock prices vis-à-vis *ARs*. These findings conform to the findings of Shankar and Randhawa (2006), who found that stocks added to the HSI showed positive returns towards index review announcement. Similarly, Madhavan (2002) also found that stocks added to Russell 2000 and 3000 indexes from 1996-2001 experienced positive abnormal returns in June i.e. the index reviews period.

Correspondingly, delay in the inclusion of the stock into index (i.e. nine trading days) caused returns to drop further to – 0.0403 (t=-4). However, these negative returns were offsets by rise in positive *ARs* as exhibited from t=-3 to inclusion date t=0. The change in *ARs* trend would be explained either by the activity of investment funds, who often are allowed to invest only in stocks that are members of an index or activities of hedge funds and private arbitrageurs who did not predicts the inclusion of the stock into index. Similarly, the volatility of stock returns (*AR*) after inclusion seemed to be relatively lower as compared to those of pre inclusion time and the linearly of the *ARs* line tends to rise, indicating that the stock exhibited on average an increasing *ARs*. These finding collaborates with the findings of Masse et al (2000) also confirmed that prices for stocks added to index do respond positively towards inclusion, outperforming market by 4.29%.

In order to test the research hypothesis I, study computed stock return mean differential between pre and post inclusion and results are shown in Table 4.2. Table 4.2 revealed an increase in *ARs* means (i.e. 0.00329 pre inclusion and 0.00433 post inclusion) and decrease in stock variances (i.e. 0.0008 to 0.00052 for pre and post inclusion). The test for significance of mean differential, at 95% level of confidence, gives t-stat of -0.1269 against t critical two-tail ±2.086. The t-statistic values failed to reject the null hypothesis as there was no significance differences between pre inclusion *ARs* and post inclusion *ARs* in the short run following index inclusion. Correspondingly, z-test revealed z - 0.1287 compared to z critical two-tail ±0.8975 also failed to reject the null hypothesis. A part from significance test, Pearson correlation between the two means revealed a very weak negative correlation of -0.067 indicating that pre inclusion abnormal returns were slightly decreasing whereas post inclusion abnormal returns were slightly increased. These results did not confirm or collaborate with any reviewed studies, as the study did not find any literature that supports no significance change in *ARs* following index inclusion.

Table 4.2: Results for *ARs* Significance Tests

Descriptive Statistics		
	Pre Inclusion	Post Inclusion
Mean	0.003291012	0.004330098
Variance	0.00079922	0.00052153
Observations	21	21
Pearson Correlation	-0.067402675	
t-Test: Paired Two Sample for Means (95%)		
t stat	-0.126909311	
P(T<=t) two-tail	0.900279438	
t Critical two-tail	2.085963441	
z-Test: Two Sample for Means (95%)		
z stat	-0.128724718	
P(Z<=z) two-tail	0.897575476	
z Critical two-tail	1.959963985	

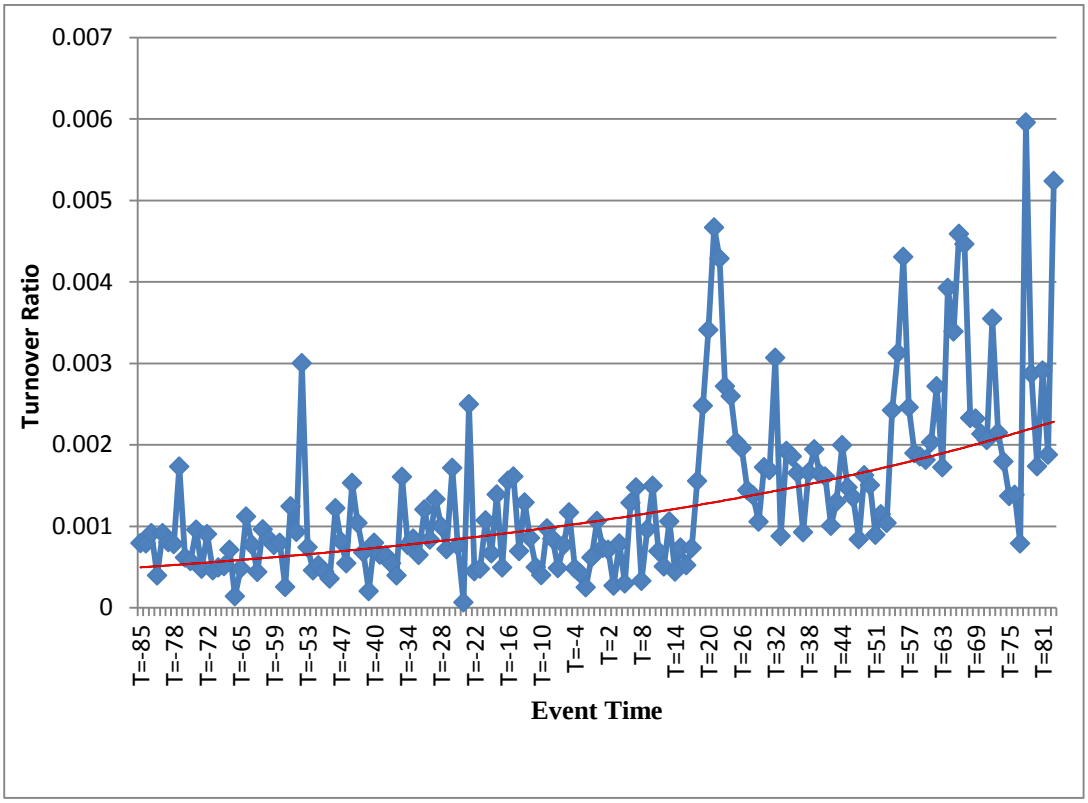
Source: Research Data

4.3 Effect of Index Inclusion on Firm's Share Turnover

The study further sought to determine the effect of index inclusion on firms share market turnover. Liquidity performance was analysed using turnover ratios which takes into account

daily trading volume over free float. The computed turn over ratios for both pre inclusion and post inclusion windows within the event period are depicted in Figure 4.4

Chart 4.4: Mumias Sugar Co. Ltd. Turnover Ratio



Source: Research Data

Findings in Chart 4.4 revealed that stock *T/R*, prior to inclusion announcement, dropped from time t=-14. The lowest pre announcement turnover rate was observed on t= -10 (0.0004) with the highest rate on t= -12 (0.009) indicating a general decline in *T/R* towards announcement date. Similarly, a decline in *T/R* towards inclusion date was depicted too, with the lowest pre inclusion *T/R* on t=-2 (0.0003) and the highest being on t=-5 (0.0012). This trend of decline in *T/R* towards announcement and inclusion dates explained the supply decrease in theory of demand and supply, as investors holding the stock wait for the post inclusion effects (price increase) to trade at higher price. These findings was not supported by any reviewed literature, as reviewed works found rise in turnover or liquidity towards index reviewed announcement (Shankar & Randhawa (2006); Bankovica and Praņevics (2007); Harris and Gurel (1986)). This difference may be attributes to different degree of market efficiency with regard to information dissemination.

After index inclusion, stock T/R tended to rise from t=1, a day after inclusion with the lowest post inclusion rate observed at time t=3 (0.0003) and the highest rate at time t=7 (0.0015). This result showed a general rise in stock *T/R* after inclusion into index. This trend may be attributed to gradual absorbed of new information in the market as more investors become aware of the stock. Conversely, slowly supply increase would also caused by investment fund managers who take time to reallocate their portfolios or activities of risk averse small investors who wait to see the actions of the bigger market participants, after inclusion, then replicate afterwards, causing volatilities to increase in the later period. Contrary to pre-inclusion turnover ratio finding, post-inclusion turnover ratio finding collaborates with the findings of Bankovica and Praņevics (2007) who found that stocks to index do exhibit high post inclusion liquidity. Similarly, Harris and Gurel (1986) also found an increase in trading volume and trading size following the inclusion of stock into index.

The study further analysed turnover ratio mean differential between pre inclusion and post inclusion means within the event window. Results for mean differential are depicted in Table 4.3.

Table 4.3: Turnover Ratio 'z – test' of Two Sample of Means

Statistics	*Pre inclusion*	*Post inclusion*
Mean	0.000826044	0.0018845
Known Variance	2.28249E-07	1.29089E-06
Pearson Correlation	0.06213	
Hypothesized Mean Difference	0	
Z stat	-7.776442653	
z Critical two-tail	1.959963985	

Source: Research Data

Findings in Table 4.3 revealed an increase in T/R mean (0.000823 pre-inclusion rates, and 0.001884 post-inclusion rates) and increase in volume variance (2.2825E-07 to 1.291E-06 for pre-inclusion and post-inclusion respectively). The test for the significance of mean differential, at 95% level of confidence, gave z-stat of -7.776 against z-critical two-tails of ±1.96. This rejects the null hypothesis, as there was significance increase in turnover ratio of stocks following index inclusion in the short run. Conversely, Pearson correlation between

the two means revealed a very weak positive correlation of 0.06213 indicating that pre inclusion and post inclusion turnover rates were slightly increasing during the event period. These findings supported findings by Shankar and Randhawa (2006); Bankovica and Praņevics (2007) and; Harris and Gurel (1986), all who found a significance rice in turnover ratio or liquidity for stocks added into index.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

The effect of inclusion of Mumias Sugar Co. Ltd stock into NSE 20 share index showed a rise in positive abnormal returns towards index inclusion announcement, which later 'ironed out' as the market mean-reverted and corrected speculative price pressure. Likewise, negative abnormal returns were exhibited towards the inclusion date which were later offsets by rise in positive returns three days to inclusion date. Conversely, the volatility of abnormal returns after inclusion seemed to be relatively lower as compared to those of pre-inclusion time denoting on average an increasing return. Finally, Mumias share yielded insignificant rise in share's return performance within the short period.

With respect to turnover, Mumias Sugar Co. Ltd share's turnover ratio tended to drop towards announcement dates and inclusion dates. After the inclusion, a general rise in stock T/R was exhibited as a result of slow absorption of index review information in the market and activities of investment funds managers who takes time to reallocate their portfolios as well as activity of risk averse small investors who mimics the actions of the bigger market participants afterwards. In the contrary to finding on market price performance, inclusion of Mumias Sugar Co. Ltd share into NSE 20 share index exhibited significant change in market trading volume in the short period.

5.2 Conclusions

The study concluded that index inclusion causes a rise in market share price by approximately 4.05% vis-à-vis insignificance rise abnormal returns within the short period. Similarly, index inclusion also causes significance increase in turnover ratio within the short period. Therefore, index inclusion has a general positive effect on affected stock through rise in price, insignificance rise in abnormal returns and significance increase in liquidity within the short-run period in a frontier capital market.

5.3 Recommendations

The study recommended that stocks to be added to blue chips indices are viable investment options as they exhibit an above average return in the short-run. However, these returns are insignificance and thus cannot warranty speculative investment strategy, if transaction cost

are captured. The simple buy-and-hold strategy is the best due to exhibited upward trends in cumulative stock returns.

5.4. Suggestion for further studies

The study suggests further studies to be carried on effects of deletion from index on firm's market share performance.

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APPENDICES

Appendix I: Results of Computed Returns

	MUMIAS SUGAR COMPANY LTD						NSE 20 SHARE INDEX		
TIME (t)	DAILY CLOSING PRICES	SIMPLE NET RETURN	COMP RETURN	COMPUTED AR_i	DAILY TRADE VOLUME	T/O RATIO	INDEX BASIS POINT	SIMPLE NET RETURN	COMP RETURN
T=-82	33.75	-0.74%	-0.74%	-0.90%	467,833	0.0009	5218.64	0.07%	0.07%
T=-81	33.75	0.00%	0.00%	-0.22%	201,800	0.0004	5227.81	0.18%	0.18%
T=-80	33.75	0.00%	0.00%	-0.04%	467,833	0.0009	5218.64	-0.18%	-0.18%
T=-79	33.15	-1.78%	-1.79%	-2.02%	410,549	0.0008	5228.75	0.19%	0.19%
T=-78	31.50	-4.98%	-5.11%	-5.38%	398,580	0.0008	5242.88	0.27%	0.27%
T=-77	30.75	-2.38%	-2.41%	-2.40%	883,367	0.0017	5228.88	-0.27%	-0.27%
T=-76	30.25	-1.63%	-1.64%	-1.34%	315,147	0.0006	5185.67	-0.83%	-0.83%
T=-75	27.50	-9.09%	-9.53%	-8.66%	292,016	0.0006	5085.89	-1.92%	-1.94%
T=-74	25.50	-7.27%	-7.55%	-7.74%	488,162	0.0010	5092.07	0.12%	0.12%
T=-73	27.50	7.84%	7.55%	7.35%	243,706	0.0005	5099.00	0.14%	0.14%
T=-72	27.15	-1.27%	-1.28%	-1.48%	460,863	0.0009	5105.41	0.13%	0.13%
T=-71	29.50	8.66%	8.30%	7.44%	234,200	0.0005	5178.07	1.42%	1.41%
T=-70	29.25	-0.85%	-0.85%	-0.93%	253,417	0.0005	5173.33	-0.09%	-0.09%
T=-69	28.25	-3.42%	-3.48%	-3.99%	261,300	0.0005	5211.27	0.73%	0.73%
T=-68	26.25	-7.08%	-7.34%	-6.84%	362,365	0.0007	5148.07	-1.21%	-1.22%
T=-67	27.00	2.86%	2.82%	2.17%	72,254	0.0001	5199.44	1.00%	0.99%
T=-65	26.50	-1.85%	-1.87%	-1.52%	247,092	0.0005	5151.46	-0.92%	-0.93%
T=-64	25.00	-5.66%	-5.83%	-6.14%	571,693	0.0011	5169.53	0.35%	0.35%
T=-63	25.25	1.00%	1.00%	0.95%	395,398	0.0008	5161.02	-0.16%	-0.16%
T=-62	24.50	-2.97%	-3.02%	-2.44%	224,064	0.0004	5091.12	-1.35%	-1.36%
T=-61	24.25	-1.02%	-1.03%	-1.26%	491,526	0.0010	5101.43	0.20%	0.20%
T=-60	24.25	0.00%	0.00%	0.21%	431,394	0.0008	5067.74	-0.66%	-0.66%
T=-59	25.00	3.09%	3.05%	2.88%	392,259	0.0008	5071.33	0.07%	0.07%
T=-58	26.25	5.00%	4.88%	4.31%	406,008	0.0008	5114.17	0.84%	0.84%
T=-57	26.50	0.95%	0.95%	0.14%	129,370	0.0003	5181.77	1.32%	1.31%
T=-56	26.25	-0.94%	-0.95%	-0.95%	635,478	0.0012	5169.28	-0.24%	-0.24%
T=-55	26.50	0.95%	0.95%	0.72%	475,918	0.0009	5179.21	0.19%	0.19%

T=-54	26.00	-1.89%	-1.90%	-2.03%	1,530,548	0.0030	5179.11	0.00%	0.00%
T=-53	27.25	4.81%	4.70%	4.68%	377,915	0.0007	5167.34	-0.23%	-0.23%
T=-52	26.50	-2.75%	-2.79%	-3.16%	233,661	0.0005	5191.53	0.47%	0.47%
T=-51	27.00	1.89%	1.87%	2.11%	267,542	0.0005	5154.41	-0.72%	-0.72%
T=-50	26.75	-0.93%	-0.93%	-0.60%	226,200	0.0004	5108.69	-0.89%	-0.89%
T=-49	26.75	0.00%	0.00%	-0.37%	183,102	0.0004	5132.74	0.47%	0.47%
T=-48	26.75	0.00%	0.00%	-0.15%	622,676	0.0012	5134.51	0.03%	0.03%
T=-47	26.75	0.00%	0.00%	0.03%	417,208	0.0008	5118.39	-0.31%	-0.31%
T=-46	26.50	-0.93%	-0.94%	-0.36%	279,066	0.0005	5048.23	-1.37%	-1.38%
T=-45	26.00	-1.89%	-1.90%	-2.07%	781,193	0.0015	5051.21	0.06%	0.06%
T=-44	26.50	1.92%	1.90%	2.28%	530,859	0.0010	5001.77	-0.98%	-0.98%
T=-42	26.00	-1.89%	-1.90%	-2.46%	346,220	0.0007	5043.35	0.83%	0.83%
T=-41	26.00	0.00%	0.00%	-0.34%	104,066	0.0002	5063.98	0.41%	0.41%
T=-40	26.00	0.00%	0.00%	-0.15%	406,489	0.0008	5065.62	0.03%	0.03%
T=-39	26.50	1.92%	1.90%	1.89%	333,348	0.0007	5054.35	-0.22%	-0.22%
T=-38	26.50	0.00%	0.00%	-0.28%	328,465	0.0006	5068.68	0.28%	0.28%
T=-37	26.75	0.94%	0.94%	0.85%	279,014	0.0005	5064.58	-0.08%	-0.08%
T=-36	26.50	-0.93%	-0.94%	-1.17%	201,997	0.0004	5074.08	0.19%	0.19%
T=-35	27.00	1.89%	1.87%	1.58%	820,806	0.0016	5089.22	0.30%	0.30%
T=-34	26.75	-0.93%	-0.93%	-1.14%	392,484	0.0008	5096.68	0.15%	0.15%
T=-33	27.50	2.80%	2.77%	2.22%	433,542	0.0009	5137.45	0.80%	0.80%
T=-32	27.25	-0.91%	-0.91%	-1.30%	330,097	0.0006	5163.47	0.51%	0.51%
T=-31	26.50	-2.75%	-2.79%	-2.70%	615,418	0.0012	5141.52	-0.43%	-0.43%
T=-30	26.50	0.00%	0.00%	-0.19%	426,340	0.0008	5147.85	0.12%	0.12%
T=-29	26.75	0.94%	0.94%	0.84%	680,204	0.0013	5144.93	-0.06%	-0.06%
T=-28	26.00	-2.80%	-2.84%	-2.77%	511,200	0.0010	5124.14	-0.40%	-0.40%
T=-27	26.00	0.00%	0.00%	0.60%	367,738	0.0007	5052.08	-1.41%	-1.42%
T=-26	25.75	-0.96%	-0.97%	-1.39%	875,907	0.0017	5080.55	0.56%	0.56%
T=-25	26.00	0.97%	0.97%	0.70%	387,978	0.0008	5093.51	0.26%	0.25%
T=-24	19.95	-23.27%	-26.49%	-27.33%	33,100	0.0001	5163.88	1.38%	1.37%
T=-23	29.00	45.36%	37.41%	37.45%	1,275,094	0.0025	5146.73	-0.33%	-0.33%
T=-22	28.50	-1.72%	-1.74%	-1.84%	228,757	0.0004	5144.20	-0.05%	-0.05%
T=-21	28.50	0.00%	0.00%	0.04%	245,496	0.0005	5127.16	-0.33%	-0.33%

T=-20	28.75	0.88%	0.87%	0.20%	548,001	0.0011	5181.07	1.05%	1.05%
T=-19	28.75	0.00%	0.00%	0.03%	341,492	0.0007	5165.06	-0.31%	-0.31%
T=-18	29.75	3.48%	3.42%	3.33%	709,894	0.0014	5160.89	-0.08%	-0.08%
T=-17	31.00	4.20%	4.12%	4.23%	252,876	0.0005	5136.53	-0.47%	-0.47%
T=-16	32.00	3.23%	3.17%	3.21%	795,975	0.0016	5120.40	-0.31%	-0.31%
T=-15	32.25	0.78%	0.78%	0.73%	822,135	0.0016	5112.62	-0.15%	-0.15%
T=-14	31.00	-3.88%	-3.95%	-3.91%	354,400	0.0007	5095.68	-0.33%	-0.33%
T=-13	30.00	-3.23%	-3.28%	-3.63%	659,464	0.0013	5117.37	0.43%	0.42%
T=-12	28.75	-4.17%	-4.26%	-4.42%	436,256	0.0009	5121.08	0.07%	0.07%
T=-11	29.25	1.74%	1.72%	1.76%	254,278	0.0005	5104.13	-0.33%	-0.33%
T=-10	29.75	1.71%	1.69%	1.37%	205,328	0.0004	5123.23	0.37%	0.37%
T=-9	31.50	5.88%	5.72%	5.50%	497,553	0.0010	5131.99	0.17%	0.17%
T=-8	32.25	2.38%	2.35%	2.17%	433,693	0.0009	5137.51	0.11%	0.11%
T=-7	32.25	0.00%	0.00%	-0.30%	247,932	0.0005	5154.42	0.33%	0.33%
T=-6	32.00	-0.78%	-0.78%	-1.30%	392,176	0.0008	5193.14	0.75%	0.75%
T=-5	31.25	-2.34%	-2.37%	-2.87%	596,421	0.0012	5230.04	0.71%	0.71%
T=-4	30.25	-3.20%	-3.25%	-4.03%	246,400	0.0005	5296.22	1.27%	1.26%
T=-3	31.00	2.48%	2.45%	2.11%	214,004	0.0004	5317.73	0.41%	0.41%
T=-2	31.50	1.61%	1.60%	1.35%	128,138	0.0003	5329.56	0.22%	0.22%
T=-1	32.00	1.59%	1.57%	1.34%	314,149	0.0006	5340.08	0.20%	0.20%
T=-0	32.50	1.56%	1.55%	1.60%	543,488	0.0011	5321.19	-0.35%	-0.35%
T=1	32.00	-1.54%	-1.55%	-1.57%	374,134	0.0007	5310.05	-0.21%	-0.21%
T=2	31.25	-2.34%	-2.37%	-2.60%	363,700	0.0007	5320.42	0.20%	0.20%
T=3	30.75	-1.60%	-1.61%	-1.32%	137,382	0.0003	5277.38	-0.81%	-0.81%
T=4	30.25	-1.63%	-1.64%	-1.63%	403,273	0.0008	5263.46	-0.26%	-0.26%
T=5	30.75	1.65%	1.64%	1.58%	151,430	0.0003	5256.44	-0.13%	-0.13%
T=6	31.00	0.81%	0.81%	0.78%	657,635	0.0013	5246.57	-0.19%	-0.19%
T=7	31.00	0.00%	0.00%	-0.07%	754,333	0.0015	5240.83	-0.11%	-0.11%
T=8	31.50	1.61%	1.60%	1.31%	167,554	0.0003	5256.76	0.30%	0.30%
T=9	30.75	-2.38%	-2.41%	-2.25%	490,696	0.0010	5227.08	-0.56%	-0.57%
T=10	30.25	-1.63%	-1.64%	-1.35%	763,966	0.0015	5184.29	-0.82%	-0.82%
T=11	31.00	2.48%	2.45%	2.96%	353,966	0.0007	5120.53	-1.23%	-1.24%
T=12	31.25	0.81%	0.80%	0.16%	259,148	0.0005	5171.30	0.99%	0.99%

T=13	29.75	-4.80%	-4.92%	-4.60%	540,300	0.0011	5126.68	-0.86%	-0.87%
T=14	30.00	0.84%	0.84%	0.41%	225,982	0.0004	5156.33	0.58%	0.58%
T=15	30.75	2.50%	2.47%	2.25%	376,797	0.0007	5165.41	0.18%	0.18%
T=16	31.25	1.63%	1.61%	1.32%	266,674	0.0005	5181.75	0.32%	0.32%
T=17	32.00	2.40%	2.37%	1.72%	374,709	0.0007	5234.70	1.02%	1.02%
T=18	33.00	3.13%	3.08%	2.56%	793,155	0.0016	5274.53	0.76%	0.76%
T=19	34.00	3.03%	2.99%	2.70%	1,264,783	0.0025	5290.38	0.30%	0.30%
T=20	36.00	5.88%	5.72%	5.16%	1,740,535	0.0034	5334.03	0.83%	0.82%
T=21	37.50	4.17%	4.08%	3.88%	2,382,346	0.0047	5341.16	0.13%	0.13%
T=22	39.50	5.33%	5.20%	4.77%	2,187,014	0.0043	5371.72	0.57%	0.57%
T=23	41.25	4.43%	4.34%	4.05%	1,388,096	0.0027	5387.76	0.30%	0.30%
T=24	42.25	2.42%	2.40%	2.12%	1,325,641	0.0026	5403.17	0.29%	0.29%
T=25	42.50	0.59%	0.59%	0.30%	1,038,329	0.0020	5419.63	0.30%	0.30%
T=26	42.25	-0.59%	-0.59%	-1.09%	1,000,891	0.0020	5458.4	0.72%	0.71%
T=27	42.75	1.18%	1.18%	0.09%	735,343	0.0014	5560.23	1.87%	1.85%
T=28	42.75	0.00%	0.00%	-0.34%	705,017	0.0014	5582.38	0.40%	0.40%
T=29	42.50	-0.58%	-0.59%	-0.98%	539,349	0.0011	5611.05	0.51%	0.51%
T=30	42.00	-1.18%	-1.18%	-0.81%	879,595	0.0017	5556.32	-0.98%	-0.98%
T=31	40.25	-4.17%	-4.26%	-3.58%	862,780	0.0017	5470.14	-1.55%	-1.56%
T=32	40.50	0.62%	0.62%	0.35%	1,566,372	0.0031	5484.63	0.26%	0.26%
T=33	41.75	3.09%	3.04%	2.69%	449,289	0.0009	5507.5	0.42%	0.42%
T=34	43.75	4.79%	4.68%	4.70%	982,725	0.0019	5490.99	-0.30%	-0.30%
T=35	44.25	1.14%	1.14%	1.03%	947,470	0.0019	5488.2	-0.05%	-0.05%
T=36	43.75	-1.13%	-1.14%	-1.56%	844,783	0.0017	5519.74	0.57%	0.57%
T=37	44.00	0.57%	0.57%	0.71%	472,108	0.0009	5491.27	-0.52%	-0.52%
T=38	43.25	-1.70%	-1.72%	-1.44%	847,355	0.0017	5448.33	-0.78%	-0.79%
T=39	41.25	-4.62%	-4.73%	-4.26%	991,944	0.0019	5384.46	-1.17%	-1.18%
T=40	38.50	-6.67%	-6.90%	-6.05%	839,900	0.0016	5282.77	-1.89%	-1.91%
T=41	36.75	-4.55%	-4.65%	-3.74%	822,783	0.0016	5176.88	-2.00%	-2.02%
T=42	37.00	0.68%	0.68%	0.85%	513,130	0.0010	5146.46	-0.59%	-0.59%
T=43	39.00	5.41%	5.26%	4.97%	663,517	0.0013	5163.11	0.32%	0.32%
T=44	40.50	3.85%	3.77%	3.27%	1,017,534	0.0020	5200.32	0.72%	0.72%
T=45	40.50	0.00%	0.00%	0.06%	753,341	0.0015	5181.63	-0.36%	-0.36%

T=46	38.75	-4.32%	-4.42%	-3.49%	691,544	0.0014	5076.04	-2.04%	-2.06%
T=47	38.50	-0.65%	-0.65%	-0.06%	429,017	0.0008	5005.89	-1.38%	-1.39%
T=48	38.75	0.65%	0.65%	0.78%	829,220	0.0016	4979.98	-0.52%	-0.52%
T=49	36.75	-5.16%	-5.30%	-4.60%	767,594	0.0015	4900.89	-1.59%	-1.60%
T=51	36.75	0.00%	0.00%	0.57%	457,670	0.0009	4835.16	-1.34%	-1.35%
T=52	38.50	4.76%	4.65%	3.99%	586,100	0.0011	4884.75	1.03%	1.02%
T=53	40.00	3.90%	3.82%	2.97%	531,280	0.0010	4953.31	1.40%	1.39%
T=54	42.00	5.00%	4.88%	3.55%	1,237,067	0.0024	5069.5	2.35%	2.32%
T=55	44.00	4.76%	4.65%	3.99%	1,594,856	0.0031	5122.4	1.04%	1.04%
T=56	42.50	-3.41%	-3.47%	-4.00%	2,197,388	0.0043	5162.14	0.78%	0.77%
T=57	42.75	0.59%	0.59%	0.32%	1,254,355	0.0025	5175.8	0.26%	0.26%
T=58	42.50	-0.58%	-0.59%	-0.61%	967,700	0.0019	5164.78	-0.21%	-0.21%
T=59	42.25	-0.59%	-0.59%	-0.23%	948,496	0.0019	5115.51	-0.95%	-0.96%
T=60	42.00	-0.59%	-0.59%	-0.44%	925,729	0.0018	5087.14	-0.55%	-0.56%
T=61	41.75	-0.60%	-0.60%	-0.19%	1,035,644	0.0020	5034.46	-1.04%	-1.04%
T=62	40.75	-2.40%	-2.42%	-2.56%	1,387,252	0.0027	5034.55	0.00%	0.00%
T=63	42.75	4.91%	4.79%	4.96%	880,295	0.0017	5005.14	-0.58%	-0.59%
T=64	43.00	0.58%	0.58%	0.62%	2,002,373	0.0039	4989.02	-0.32%	-0.32%
T=65	43.25	0.58%	0.58%	0.64%	1,729,454	0.0034	4971.04	-0.36%	-0.36%
T=66	43.50	0.58%	0.58%	0.10%	2,341,828	0.0046	5003.99	0.66%	0.66%
T=67	43.50	0.00%	0.00%	0.11%	2,277,373	0.0045	4980.49	-0.47%	-0.47%
T=68	36.40	-16.32%	-17.82%	-18.25%	1,188,938	0.0023	5009.87	0.59%	0.59%
T=69	36.25	-0.41%	-0.41%	-1.09%	1,185,360	0.0023	5063.06	1.06%	1.06%
T=70	36.10	-0.41%	-0.41%	-0.68%	1,088,004	0.0021	5075.85	0.25%	0.25%
T=71	36.20	0.28%	0.28%	0.10%	1,050,329	0.0021	5080.63	0.09%	0.09%
T=72	36.00	-0.55%	-0.55%	-1.13%	1,809,444	0.0035	5124.31	0.86%	0.86%
T=73	35.60	-1.11%	-1.12%	-1.26%	1,096,407	0.0021	5125.94	0.03%	0.03%
T=74	35.60	0.00%	0.00%	0.07%	916,761	0.0018	5106.23	-0.38%	-0.39%
T=75	35.55	-0.14%	-0.14%	-0.08%	699,998	0.0014	5087.22	-0.37%	-0.37%
T=76	35.55	0.00%	0.00%	-0.21%	707,292	0.0014	5095.44	0.16%	0.16%
T=77	35.60	0.14%	0.14%	-0.52%	402,179	0.0008	5147.62	1.02%	1.02%
T=78	35.65	0.14%	0.14%	-0.08%	3,039,564	0.0060	5156.9	0.18%	0.18%
T=79	35.75	0.28%	0.28%	0.18%	1,465,159	0.0029	5153.84	-0.06%	-0.06%

T=80	35.80	0.14%	0.14%	-0.27%	885,774	0.0017	5181.29	0.53%	0.53%
T=81	36.20	1.12%	1.11%	0.62%	1,484,572	0.0029	5217.68	0.70%	0.70%
T=82	36.40	0.55%	0.55%	0.61%	957,500	0.0019	5198.23	-0.37%	-0.37%
T=83	36.70	0.82%	0.82%	0.36%	2,671,200	0.0052	5231.27	0.64%	0.63%

Appendix II: NSE 20 Share Index Constituents Companies as at July 2013

Agricultural
Kakuzi
Sasini Tea and Coffee Limited
Commercial and Services
Kenya Airways Ltd
Nation Media Group
Scangroup Ltd
Uchumi Supermarket Ltd
Telecommunication and Technology
Safaricom Ltd
Banking
Barclays Bank Ltd
Kenya Commercial Bank Ltd
Standard Chartered Bank Ltd
Equity Bank Ltd
The Co-operative Bank of Kenya Ltd
Investment
British American Tobacco Kenya Ltd
East African Breweries Ltd
Mumias Sugar Co. Ltd
Construction and Allied
Athi River Mining Company Ltd.
Bamburi Cement Ltd
KenolKobil Ltd
KenGen Ltd
Kenya Power & Lighting Co Ltd

Source: NSE (2014)

Appendix III: Composition Changes in NSE 20 Share Index from 2000 to 2003

S/N.	2000		2001		2002		Mar-03	
1	Unilever Tea		Unilever Tea		Unilever Tea		Unilever Tea	
2	Williamson Tea		Williamson Tea		Williamson Tea		Williamson Tea	
3	Kakuzi		Kakuzi		Kakuzi		Kakuzi	
4	Sasini		Sasini		Sasini		Sasini	
5	African Lakes	IN	African Lakes	OUT	TPS Ltd	IN	TPS Ltd	
6	Kenya Airways		Kenya Airways		Kenya Airways		Kenya Airways	
7	Nation Media		Nation Media		Nation Media		Nation Media	
8	Uchumi		Uchumi		Uchumi		Uchumi	
9	Barclays Kenya		Barclays Kenya		Barclays Kenya		Barclays Kenya	
10	Diamond Trust		Diamond Trust		Diamond Trust		Diamond Trust	
11	NIC Bank		EA Packaging		EA Packaging	OUT	NIC Bank	IN
12	KCB		KCB		KCB		KCB	
13	Standard Chart		Standard Chart		Standard Chart		Standard Chart	
14	Bamburi Cement		Bamburi Cement		Bamburi Cement		Bamburi Cement	
15	BOC Gases		BOC Gases		BOC Gases		BOC Gases	
16	BAT (K) Ltd		BAT (K) Ltd		BAT (K) Ltd		BAT (K) Ltd	
17	EABL		EABL		EABL		EABL	
18	KPLC		KPLC		KPLC		KPLC	
19	K. National Mills		K. National Mills	OUT	Firestone EA	IN	Firestone EA	
20	Total Kenya		Total Kenya		Total Kenya		Total Kenya	

S/N.	2006		Jul-07		Jul-08		Dec-09	
1	Unilever Tea	OUT	Rea Vipingo	IN	Rea Vipingo		Rea Vipingo	
2	Williamson Tea	OUT	CMC Holdings	IN	CMC Holdings		CMC Holdings	
3	Kakuzi	OUT	Express Kenya	IN	Express Kenya		Express Kenya	
4	Sasini		Sasini		Sasini		Sasini	
5	TPS Ltd		TPS Ltd	OUT	Safaricom	IN	Safaricom	
6	Kenya Airways		Kenya Airways		Kenya Airways		Kenya Airways	
7	Nation Media		Nation Media		Nation Media		Nation Media	
8	Uchumi	OUT	I.C.D.C.I	IN	Centum Invest.	OUT	Co-operative Bank	IN
9	Barclays Kenya		Barclays Kenya		Barclays Kenya		Barclays Kenya	
10	Diamond Trust		Diamond Trust	OUT	Equity Bamk	IN	Equity Bamk	
11	NIC Bank	OUT	Mumias Sugar	IN	Mumias Sugar		Mumias Sugar	
12	KCB		KCB		KCB		KCB	
13	Standard Chart		Standard Chart		Standard Chart		Standard Chart	
14	Bamburi Cement		Bamburi Cement		Bamburi Cement		Bamburi Cement	
15	BOC Gases	OUT	Kengen	IN	Kengen		Kengen	
16	BAT (K) Ltd		BAT (K) Ltd		BAT (K) Ltd		BAT (K) Ltd	
17	EABL		EABL		EABL		EABL	
18	KPLC		KPLC		KPLC		KPLC	
19	Firestone EA		Sameer Africa	OUT	East African Cables	IN	East African Cables	
20	Total Kenya		Total Kenya	OUT	Athi River Mining	IN	Athi River Mining	

Source: Nairobi Security Exchange (2014)