

**ANALYSIS OF THE RELATION BETWEEN MARKET  
CAPITALIZATION AND STOCK MARKET INDICES AT THE NSE**

**BY**

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**A RESEARCH PROJECT PRESENTED IN PARTIAL  
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION,  
SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI**

**OCTOBER 2012**

## DECLARATION

I declare that this is my original work and has not been presented for award of any degree in any university.

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D61/73548/2009

This proposal has been submitted for examination with my approval as the University Supervisor.

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## **DEDICATION**

I dedicate this project to my parents Alfred Kamundi and Silveria Mwaria for their care, support and moral upbringing. To my fiancée Purity for her care, understanding, concern and enthusiasm that inspired me to achieve this goal.

God Bless you all abundantly.

## **ACKNOWLEDGEMENTS**

This study would not have been possible without the support and assistance of a number of people. First, I give thanks to the Almighty God for giving me the strength and knowledge to carry out the study.

Special thanks go to my Supervisor, Mr. Peter Opande, who provided critical assistance and critique to me during the entire project period. Indeed his insights and diligent support helped in shaping the study.

Special thanks go to my family for their support, encouragement and love during the research project writing process.

I equally place on record my study colleagues particularly Dennis, Mbithi, Noel and Jesse whose valuable contribution enabled me to sail through the course.

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## ABBREVIATIONS

ADF	Augmented Dicky Fuller
ASE	Athens Stock Exchange
CAPM	Capital Asset Pricing Model
CI	Co-integration
CMA	Capital Market Authority
DAX	Deutscher Aktien Index
DJIA	Dow Jones Industrial Average
EG	Engle & Granger
EGARCH	Exponential Autoregressive Conditional Heteroskedascity
GDP	Gross Domestic Product
IFC	International Finance Corporation
MCAP	Market Capitalization
ML	Maximum Likelihood
MVA	Market Value Added
NASI	NSE All Share Index
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Square
S&P	Standard and Poor
TOR	Turnover Ratio
UK	United Kingdom
USA	United States of America



## **ABSTRACT**

The objective of this study was to analyze the relation between market capitalization and stock market indices at Nairobi Stock Exchange (NSE). The various functions fulfilled by market indices make it important to assess their suitability as indicators of market performance alongside the market capitalization. The Nairobi Stock Exchange was used as the case study. The study employed time series analysis where E-views software was used to analyze the data to assess the relation among the variables. The study established that there exists a strong positive relationship between market capitalization and the NSE indices. However, the NSE-20-share index was found to be more significant in explaining most of the changes in the market capitalization than the NASI. This was mainly due to the nature and composition of the indices. Within that period of study, it was determined there was a very strong positive correlation between market capitalization and NASI and a rather moderate positive relationship between market capitalization and NSE 20 share index.

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background of the study**

Stock markets have existed for a number of centuries and have historically played a significant role in economic development by facilitating mobilization of long term capital (Ngugi, 2003). They do so by providing liquidity to various market players. Stock markets also provide investors with a platform for investing in various financial instruments (both underlying assets and derivatives). Key drivers in these markets are the returns and capital gains from respective securities. As a result, accurate measurement of the stock market performance is critical to information users as it helps to understand the demand, liquidity and return levels as well as the ease with which investors can mobilize capital.

### **1.1.1 The Concept of Market Capitalization and Stock Market Index**

Olson (2005) defines market capitalization as the price of a stock at any given time multiplied by the amount of shares outstanding. From a market perspective, market capitalization comprises the sum of individual outstanding shares by their prices for all the companies listed in a given stock market. According to Olson market capitalization can be classified as follows; one, large –cap ranging from \$10 – 100 billion; mid-cap (\$ 1 – 10 billion); Small-cap (\$100 million – 1 billion) and micro-cap (\$10 - \$ 100 million). Olson notes that there is no clear consensus or roles governing on the exact cut of values and whether categorization should be dollar denominated or percentiles. However, categorization cut of need to be adjusted over time due to inflation, population change

and overall market valuation. Normally, this varies on a daily basis depending on changes in prices of the respective shares hence the need to identify appropriate indicators that will help players in the stock market to monitor the changes. Through this, the players are able to make informed investment decisions. Stock market indices are the commonly used indicators employed to monitor and report changes in market capitalization and market performance.

Simply defined, a stock market index is a measure of changes in the stocks markets and mostly presumed to be reasonably representative of the market performance as a whole (Olson, 2005). According to Olson, indices only make sense in the percentage change of their numerical values than the absolute values. Major indices around the world include; the NASDAQ, Dow Jones, S&P Global 100 and NYSE indices in USA; FTSE 100 in UK; Nikkei 225 in Japan; FTSE SGX in Singapore; SSE Composite index in China; S&P/ASX 200 in Australia, among others. These indices are a better indicator of stock market performance. Computation of these indices varies in one way or the other depending on the composite, selection criteria and assumptions therein.

Koller et al (2010) defined stock market performance as a measure of returns on shares over a period of time. The period over which stock returns are measured is based on personal preferences though portfolio managers usually measure stock market performance on daily, weekly, monthly and yearly basis. Measurement of stock market performance is done using various ways where common measures include use of market capitalization figures and stock indices computed daily based on individual stock prices.

The market performance determines whether investors are making positive or negative returns on their portfolio.

Given the complexity of following daily price movements, most individuals prefer looking at changes in market capitalization and indices. Reliability of stock indices in showing market performance have gained more significance in their use as basis for the derivatives markets. Portfolio managers use derivatives as tools for their portfolio strategies to mitigate risks where they are used for hedging and arbitrage purposes. As a result, for a stock index to perform this function it has to fulfill both statistical and economic requirements, Fisher (1992).

### **1.1.2 The Nairobi Securities Exchange**

In Kenya, both the market capitalization and stock indices are significant performance indicators and are used to inform investment decisions. The stock market in the country has come a long way given that dealing in stocks started in the 1920s. However, at this time there were no formal rules and regulation governing stock broking activities. Prices were normally exchanged over a cup of tea or coffee and clients were obligated to honour their contractual commitments by making delivery and paying the relevant costs (Nairobi Stock Exchange, 2011).

In 1954 The Nairobi Stock Exchange (NSE) was established as a voluntary association of stockbrokers registered under the Societies Act that trade become formalized. Since then the exchange has undergone numerous institutional and policy transformations. Key among these transformations includes; tightening of disclosure rules, rationalization of tax policy favourable to both local and foreign investors and regulatory changes (Ngugi,

2003). The establishment of the Capital Market Authority under the CMA Act of 1989 is probably one of the remarkable regulatory and policy reforms that have taken place in the exchange as it resulted in a shift from self regulatory to statutory-regulatory framework. These reforms saw the exchange grow significantly and in 1994, International Finance Corporation (IFC) rated the NSE as the best performing market in the world with a return of 179% in dollar terms. The hull mark of these transformations was witnessed in September 2006 when NSE trading switched from floor trading to live trading on the automated trading system (NSE, 2011).

The NSE just like other established stock exchanges in the world plays an important role in promoting economic development in the country. Key among these roles include; promoting savings; providing a platform for investing in productive enterprises; facilitating rational and efficient allocation of capital; enhancing access to finance by providing flexibility for customization; and providing investors with an efficient mechanism to liquidate their securities (NSE home page, 2011). To perform these vital roles, dissemination of correct information on market performance and the relationship between market capitalization and stock indices is paramount.

Within the NSE, the NSE 20-Share Index and Nairobi All Share Index (NASI) are used to indicate market performance. The NSE 20-Share Index was introduced in 1964, a year after Africans were first allowed to trade on the NSE. On February 2008 the NSE All Share Index (NASI) was introduced and aimed at reflecting the total market value of all stocks traded on the NSE in one day as opposed to just the price changes of the 20 best performers captured by the NSE 20 index (*NSE Press Release, 2008*). The two indices

are price weighted and are based on geometric mean of average mean prices of constituent companies which are equally weighted. The NSE – 20 Share index consists mainly of blue chip firms that have already established a strong hold on their market shares in the sectors they operate in and have a clear dividend pay-out policy. Firms currently comprising the index include; Rea Vipingo, Sasini, Kenya Airways, Centum, Nation Media Group, Safaricom, Barclays, Equity, KCB, Stanchart, Co-operative, EABL, Athi River Mining, Mumias, Bamburi, BAT, KenGen, KPLC, Kenol Kobil, Express and CMC Motors (*NSE Press Release, September, 2010*).

According to *NSE 20-Share Index Manual*, the NSE 20 share index is an equi-weighted geometric mean of 20 large companies' ordinary stocks traded on the bourse. The index measures price movement in selected, relatively stable and best performing 20 listed companies.

On the other hand, NASI was introduced to complement and address the shortcomings of NSE 20 share. NASI incorporates all listed companies irrespective of their performance and their time of listing as opposed to the 20 Share Index which measures price movement in the best performing 20 companies amongst the listed ones. Basically the shortcomings of the NSE 20 share index include; one, the NSE 20 Share index measures the average performance of 20 large capitalized stocks drawn from different industries (*NSE Press Release, 2008*). In contrast, experience indicates that most large cap stocks do not record a high performance as compared to low cap stocks. At times small cap counters have potential to record growth averaging at 50% which is unlikely for large cap stocks. This makes the 20 Share index to be biased towards a large cap counters and thus

fails to reflect the right signals on the entire market performance to potential investors. Second, susceptibility to volatility in one or more of the constituents counters thereby resulting to biasness of the index.

## **1.2 Problem Statement**

Moles, Parrino and Kidwell (2011) note that to disseminate the performance of the stock markets to stakeholders, stock exchanges use different ways. Key among these ways is the computation of stock indices and tracking their changes between each computation. Stock indices often influence investment decisions in the stock markets. Investors use stock indices to track overall performance of the stock markets where some benchmark their portfolios to the index with most preferring to hold portfolios comprising index constituent counters (*Business Daily*, 2011).

Given that Kenya's capital market is registering rapid growth with the intention of introduction of derivatives market, there is need to analyse the relation between the NSE indices and market capitalization. This is critical in that one premise of efficient capital markets hypothesis is accuracy and timely availability of market information to various users. In fact the NASI was introduced in 2008 to ensure a comprehensive dissemination of market information to investors (*NSE Press Release*, 2008).

Various studies have been carried on stock market indices and market capitalization in the NSE. For example Odera (1999) carried out a study on determining the accuracy of the NSE 20 share index by addressing its weaknesses and proposed a composite index. Ngugi and Njiru (2005) carried out a study on growth of NSE primary stock market mainly focusing on policy and regulatory framework. Ngugi (2003) carried out a study

on determinants of liquidity of stock markets with NSE as the case study. Kibuthu (2005) carried out a study on capital markets in emerging economies focusing on structure, organization, regulation and performance trends. Whereas there are various studies carried out at the NSE stock market, no study has been done to analyse the relation between market capitalization and stock indices. Given that investors need easy and accurate indicators of stock market performance, determination of the relationship between the two variables under study will help to create a better understanding of the market and utilization of the information disseminated. This study, therefore, seeks to determine the relationship between market capitalization and stock market indices that investors can monitor to make informed investment decisions?

### **1.3 Objectives**

The general objective of this study is to determine the relationship between market capitalization and NSE share indices.

Specific objectives guiding the study include;

- i. To determine the strength of the relationship between market capitalization and NSE 20 share index as indicators of stock market performance.
- ii. To determine the strength of the relationship between market capitalization and NASI as indicators of stock market performance.
- iii. To determine the extent of the relationship between market capitalization and NSE share indices.



#### **1.4 Value of the Study**

This study will provide important information regarding the relationship between market capitalization and NSE stock indices. From the evaluation, it will be possible to understand implications on various stakeholders in their decision making process in regard to the stock market as a result of the relationship. In particular, the study will be of critical importance to the following groups;

Portfolio managers are bestowed with maximization of investors' wealth by investing wisely in the stock market. To do so, they employ various tools and stock market performance indicators where indices are given key consideration. As a result, portfolio managers will utilize the findings of this study to identify potentials ways through which they can maximize their return and mitigate market related risks. The information provided will also help to enhance their precision in day to day decision making within emerging markets like Kenya's capital market.

Researchers interested in carrying out related studies or issues raised in this study will use the findings of this study as secondary data. Emerging findings will help to reinforce existing stock indices theories by providing a clear direction and magnitude of the relationship. The findings will be utilized to contextualize their studies and guide them into areas that require further inquiry. In particular, researchers interested in studying efficiencies in emerging markets in Africa will find information in this study resourceful.

Capital Market Authority (CMA) which is mandated to regulate the operations of the NSE as well as NSE executives will utilize the findings of this study to refine their

policies to enhance market efficiency in dissemination of accurate market performance. Strong market efficiency is critical in winning investor confidence which in return enhances liquidity and reputation of the stock market. Improved market efficiency will help to benchmark Kenya's stock market among other major world stock markets. In addition, given that CMA intends to start derivatives markets where indices are frequently utilized by players in this market, their effectiveness in indicating stock market performance should not be biased.

Other market players especially the retail investors in stocks and derivatives markets will utilize information in this study to make more informed decisions. Understanding the nature of relationship will enhance returns for investors who rely on such market performance indicators to make their investment decisions regardless of whether they are driven by speculative/ arbitrage, capital gain, risk management (hedging).

The findings of this will contribute to the body of knowledge at the university and beyond. Students and other scholars will seek the findings of this study to gain more insights on market capitalization, stock indices and their influence on stock and derivatives market investment decisions.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter attempts to give both the theoretical and empirical review related to the study topic. In this regard, sections 2.2 to section 2.9 focuses on theoretical review which includes; stock market theories, stock market performance indicators, types of stock market indices, methods of computing stock market indices, function of stock market indices and their shortcomings. On the other hand section 2.10 deals with empirical studies as presented by various scholars on stock market performance indicators.

#### **2.1.1 Utilization/ Functions of stock indices**

Stock market indices measure the value of a portfolio of average of stock prices (Cary and Chris, 1998). According to them, the stock indices perform two important functions, that is, descriptive and operative functions. Under the descriptive function, stock markets as aggregate measures are instruments to meet the information requirements of investors by characterizing the development of markets and specific market segments. Stock market indices fulfill the operative function by acting as a basis of derivatives instruments by facilitating application of certain portfolio management strategies such as hedging and arbitrage trading. Richard & Tierney (2004) pointed out that a valid benchmark should have the following properties; appropriate, measurable, investable, reflective of current investment opinion, unambiguous and specified in advance – AIMR US.

According to Moles, Parrino and Kidwell (2011) stock market indices are used to measure stock market performance regardless of whether share prices are moving up or down. Some stock indices provide an international benchmark for global investment. They argue that players in the stock market watch stock indices closely to track down the economic activity as well as to measure the performance of specific type of firms. In most cases, stock market indices are designed to indicate the performance of a given market, a sector of the overall market or a particular type of investment. The purposes for which indices are used vary considerably and as such, price, value and total return based indices are computed to indicate specific information to various users.

Sutcliffe, M. S. (2006) notes that various stock market indices have been developed to meet the strong demand for aggregate measures of stock market performance. Normally indices are designed to quantify wide spread movement in stock prices. These indices only gain their significance if there is generally a positive correlation between the price changes of different shares. He notes that the stock market indices are constructed for various reasons that includes; providing a historical comparison of money invested in the stock market against those invested in some other assets; used as a simple standard measure to compare the performance of investment fund managers and they are also used as lead indicators on national economic performance in that share prices are a measure of market's expectations of cash flow.

Furthermore, stock market indices provide investors with the possibility of estimating not only the state of separate stocks but the state of the entire market, sector or region. Stock

market indices in the countries of the world reflect the general fluctuations of the market of those companies' stock which are quoted in the country (Pilinkus, D. 2010).

## **2.3 Stock Market Index Theories**

Various scholars have developed numerous theories explaining the investors' behaviors, price trends, stock performance and relationship of indicators among others

### **2.2.1 Dow Theory**

Chen (2010) discusses the Dow Theory which was developed by Charles Dow. The theory illustrates price trends in the stock market. According to Dow Theory there are several primary principles of market price action which include; one, that the market discounts everything, that is, all news and fundamental information are always priced or reflected in the market prices of stock. Two, the average stock market indexes are comprised of three trends, that is primary, secondary and minor. Primary trends are major price directional move; secondary trends are counter trends which don't last long while minor trends occur within the secondary trends lasting only a few hours. Three, the theory point that primary trend is the most important trend where three phases occur, that is, accumulation or distribution, public participation and excess. Four, confirmation, whereby according to Dow two indexes have to confirm each other in either an uptrend or downtrend, normally, a price trend will be confirmed where there is a complete reversal. Five, volume confirms trends, whereby a change in price direction should be accompanied by large trends. Finally, price trends are valid until reversed, that is trends continue until there is a clear evidence that a bona fide reversal has occurred.

### **2.2.2 Veblen's theory of discrepancy between market prospective profit and current capitalization**

According to Mitchell (1970) prosperity, crises and depression are business phenomena and are behind increases or decline in prices and profits. Generally a period of prosperity is ushered in by price rises due to high government and industry purchases as well as increased consumer purchasing power. As demand for goods and services increases, aggressive business enterprises expand its ventures. It is this rise in demand, prices and expansions that increase the prospective profits. By extension, larger business profits lead to higher market capitalization. The theory asserts that this sequence of growing demand, price increases, rising profit expectations, swelling capitalization and expanding credits run cumulatively as long as they are higher than anticipated costs. However, in the long run this process reverses and costs rise more than anticipated profits bringing down demand, prices and eventual profit margins. Stock indices for the enterprises also move in tandem with price trend or the business cycle.

### **2.2.3 Discounted cash flow valuation theory**

The theory is as discussed Lee, John and Alice (2010) is the basic tool for establishing the theoretical price of a corporate security. According to the theory, the price of a security (share) is equal to the present value and future benefit of ownership. In case of a common stock, these benefits include dividend paid and gain during the ownership period. The theory notes that pricing or valuation of common stock is more complicated than in fixed security due to uncertainty of future cash flows. As a result, dividends

expected may change based on management decision while prices may rise or fall depending on the business lifecycle resulting losses or gain when the stock is sold. Therefore, pricing of common stock require forecasting expected capital gains and the stream of expected dividend at a required rate of return.

#### **2.2.4 The Efficient Market Hypothesis (EMH)**

Oblieugh (2010) notes that those in support of the efficient market hypothesis argue that only changes in fundamental factors of a company such as earning outlook or profit margins ought to affect share prices beyond the short term where random ‘noise’ in the stock market may prevail. The theory is based on the assumption that little or no trading takes place given that prices are at or near equilibrium having priced all the public knowledge. Efficient market reflects true stock market performance to the investors. All news or any other information is always reflected in the market prices of stock.

#### **2.2.5 The Greater Fool Theory**

The greater fools theory is premised on the belief held by an individual investor who makes a questionable stock purchase in the stock market with the assumption that he will pass it on to ‘a greater fool’ at a higher price. Such a purchase is more often than not informed by fundamentals but rather by speculation expectation of selling the shares to a greater fool at higher price. The theory originates from the idea that if an investor makes a foolish decision to purchase an expensive stock, the investor is expected to find a greater fool who offload the stock in the near future. For this theory to hold certain assumptions must exist; one, that irrational market optimism with high upside momentum

over a particular stock or the entire market exists. Two, irrational exuberance among market player must remain high (Oblienugh, 2010).

### **2.2.6 The Keynesian Beauty Contest Theory**

The theory was developed by John Maynard Keynes who used the hypothetical newspaper beauty contest to explain the behaviour of investors in the stock market. Oblienugh (2010) Keynes argued that much of the investments in the stock market are driven by expectations about what the other investors think, rather than rational expectation about the fundamental viability of a particular share investment. He explains that stock market volatility occur because investments are determined by the herd-like ‘animal spirits’ of the investors. Keynes illustrated this herd mentality of investor with the analogy of a beauty contest that featured in a newspaper picture of a number of young women. The contest will be won on popular vote and readers are expected to vote for their favorite contestants. Entrants are asked to choose a set of six faces from the photographs of women that are ‘the most beautiful’ and those who pick the most popular face are eligible to contest for the prize.

As a result, a contestant is supposed to rely on his or her own concept of beauty. But to win the prize, s/he must do a second guess on other contests’ picks in order to make a selection that wins popular vote. In so doing the contestant disregards his own concept of beauty and picks the faces based on perceived beauty standards. Similarly, in the stock market Keynes explained that investors exemplify the same behaviour by pricing shares not based on their fundamental value but on what everyone else thinks is the true value.



He asserts that to thrive in this market phenomenon one must have a great mastery in understanding mob psychology.

### **2.3 Factors influencing share prices in the stock markets**

Roche (2005) noted that Ernst & Young conducted internationally a series of studies called 'Measures that Matter' into the key factors influencing share prices. The studies established that a significant proportion of the share price (and investors return) is attributable to qualitative activities which cannot be objectively measured. These activities or attributes include quality of management, quality of strategy, innovations, human capital and strength of customer relationships among others. For example, in 1988, Ernst & Young in their research identified that at least 35% of the fund managers' investments decisions were highly influenced by a company's non-financial performance especially in times of uncertainty.

Ranganatham and Madhumathi (2006) argued that irrespective of the economic situation, some industries will be expected to perform better and share prices for companies in these industries may not decline as much as those in other industries. They, therefore, point out that proper identification of economic and industry specific factors influencing share prices helps investors to identify shares that suit their expectations or investment strategies. In relation to economic situation, they assert that it is important to understand the stage at which an economy is in the business cycle.

According to Babu (2007) the market price of a given share is dependent on the demand and supply forces of the share. However, there are a number of factors influencing share

prices/ market behaviour in the stock market which includes; external factors (economic, political and environmental development); internal factors (financial performance of the company); capital structure; investment habit (psychological and emotional elements) of the public; foreign exchange rate and interest rates. Factors like rumours, inside information, cornering, price rigging and other malpractices can also greatly affect share prices. According to him low interest rates may encourage investors towards the stock market in that availability of funds at low interest rates propels lenders and speculative investors to invest more in stocks than in other investments options especially the fixed income assets. This case is more pronounced when the stock markets are vibrant as they guarantee better overall returns.

#### **2.4 Indicators of stock market performance**

Koller et al (2010) outlined a number of measures that indicate the stock market performance. One is the total returns to shareholders which they defined as share appreciation plus dividends. However, they observed that this method has limitations in that it does not measure actual performance, but rather performance against expectations, which can severely penalize the best performing companies. To mitigate this, the scholars suggested that companies use Market Value Added (MVA) and market Value to Capital methods.

Grant (2009) pointed out that for investors interested in making profit over the lifetime of a given firm, there is need to evaluate the performance of a firm by looking at its stream of profit (or cash flows) over the rest of its life. According to Mckinsey et al (2010), stock market performance can be measured using market value to invested capital;

market value to invested capital compares a company's market value (both debt and equity) to the amount of capital that has been invested in the company (fixed assets, working capital and investments in intangibles from acquisitions).

Levine and Zervos (1996) outlined six stock market performance indicators that includes; stock market size; two measures of stock market liquidity, stock market volatility, and two measures of stock market integration with world capital markets. However, they acknowledge that each of these indicators has shortcomings, but using a variety of these measures provides a better picture of the stock market performance and the link with economic growth than if only a single indicator was used. Market capitalization is also used as an indicator of market development. George and Gentile (2001) pointed out that market capitalization as one indicator of stock market performance. They pointed out that knowledge of a company's size is useful in that it helps to compare a given company to those of similar size.

## **2.5 Types of stock market indices**

According to Cary and Chris (1998) there are three categories of stock indices; average, capitalization weighted and performance based indices where a given index will fall under one of the three indices. Sutcliffe (2006) classifies stock indices into two categories, that is, the weighting system (market value weighted, price weighted or equally weighted) and the averaging procedure (arithmetic or geometric).

### **2.5.1 Weighted System**

For the weighted system, the simplest way to construct an index is by simply applying the share prices without giving any weights. Under the equally weighted index, the price of each share in the index is given an equal weight in the calculation of the index (achieved

by considering the proportionate change in the price of each share relative to a base date (e.g. price relatives). Weighting under this case gives more weights to share prices of companies that constitute a large proportion of the value to the shares held by the shareholders and vice versa. As a result, these indices are often referred to as market capitalization indices and normally computed as the number of shares issued by a company multiplied by the share price at a specified time. A capitalization weighted index has numerous advantages: one, each share price is weighted in accordance with its importance in the average portfolio of shares. As such, with proper averaging method, changes in the index measure changes in the value of the average portfolio and by extension changes in the market as whole. Two, capitalization weighted index is harder to manipulate than most of the other weighted schemes given that the more liquid shares tend to get more weights.

### **2.5.2 Average system**

This method involves aggregating the prices (or price relatives) of individual shares to obtain the value of the index. This is either done using arithmetic or geometric method. Arithmetic weighting often denoted as AU involves multiplying each share price with its weight and aggregating the products to produce the index, that is,  $AU = (w_1x + w_2x + w_3x + \dots + w_nx)$ . Where  $x$  is the individual share price and  $(w)$  are weights and add up to one. The geometric weighted average (GW) is computed as follows;  $GW = (x_1^{w_1})x_2^{w_2}x_3^{w_3}$ . Under this case the weights differ from one share price to another for the constituent counters. For the equally weighted (or un-weighted) geometric mean (GU) becomes the  $n^{\text{th}}$  root of the product of the numbers, that is,  $GU = [x_1 x_2 x_3]^{1/3}$ . This

category of indices has its own advantages and disadvantages as discussed later in section 2.6 of this chapter.

## **2.6 Methods of computing stock market indices**

The methods of computing stock market indices are largely influenced by the purpose they are intended to achieve. Moles, Parrino and Kidwell (2011) outline four major stock market indices depending on their mode of computation which includes; price, value and total return based indices as well as specialized indices. According to them, price based index is one of the oldest stock indices and measures how the price of its constituents changes between each computation. Examples of this index include the Dow Jones Industrial Average (DJIA) in US and NSE 20 share index in Kenya. Most indices are value indices and track the portfolio of shares that make up the index changes in value over time. Common examples of these indices include the French market CAC-40, made up of the 40 leading French listed companies; the FTSE 100 index in UK of the top 100 companies in value. Total return indices include the effects of dividends paid by companies. An example of this is the German market's DAX (Deutscher Aktien Index). Specialized type of indices include indices such as the Amex Oil Index that measures the performance of the major international energy companies or the FTSE4Good set of indices that measure the performance of companies based on internationally recognized corporate responsibility standards.

Sutcliffe (2006) noted that all market weighted and equally weighted have a base date i.e. time when the value of the index is set to unity. He notes that while any date can be chosen as the base, for market indices the first date the index is computed is taken as the

base. According to him the formula for computing the arithmetic price weighted index at time  $t$  is as follows;

$$AP_t = \sum_{j=1}^n P_{jt} \quad \text{where } j = 0 \text{ and } t$$

To compute the arithmetic weighted index at time  $t$  when the base is time  $0$ , denoted as  $AW_t^0$  can be expressed as the arithmetic average of the relative prices, i.e.

$$AW_t^0 = \sum_{j=1}^n w_j R_j \quad \text{where } R_j = P_{jt}/P_{j0} \text{ and } \sum w_j = 1$$

To compute the geometrically equally weighted stock market index at time  $t$  when the base time is  $0$ , denoted as  $GU_t^0$ , you proceed as follows:-

$$GU_t^0 = (Z_t/Z_0)^{1/n} \quad ; Z_j = P_{1j} \times P_{2j} \times P_{3j} \times \dots \times P_{nj} \text{ where } j = 0 \text{ and } t$$

It should also be noted that the rate of return computed under the geometric index is independent of the base date as there exists a reciprocal relationship, that is, the rate of return calculated using different base dates must be equal. On the converse, changing the base dates for the arithmetic index changes the rates of return. This implies that changing the base date also changes the historic rates of return for all the previous periods.

## 2.7 Nairobi Stock Exchange Indices

Nairobi Stock Exchange has two stock indices namely; the NSE 20 Share Index and the NSE All Share Index (NASI).

### **2.7.1 The NSE 20 Share Index**

The NSE 20 Share Index is price weighted based on a geometric mean of average prices of the constituent companies which are equally weighted. In line with best practice, the NSE 20-Share index is reviewed periodically to ensure that it reflects an accurate picture of market performance. To ensure that the index reflects market performance, the following criteria is used in selecting the companies that constitute the index: one, trading activity measures i.e. market capitalization, shares traded, deals/liquidity, and turnover during the period under review are weighed in the ratio of 4:3:2:1 respectively. Two, a company must have at least 20% of its shares quoted at the NSE. Three, a company must have a minimum market capitalization of Kshs. 20 million. Four, a company should ideally be a “blue chip” with superior profitability and dividend record. The index need to be accurate and a true representative of the stock market performance in order to enable the investors make informed investment decisions. The index should not be looked at as figure by itself but instead, as a percentage change in order to make meaning out of it.

### **2.7.2 The NSE All Share Index (NASI)**

NASI which is a market capitalization weighted index. It was introduced to complement and address the shortcomings of NSE 20 share. The index incorporates all listed companies irrespective of their performance and their time of listing. The NASI therefore differs from the 20 Share Index which measures price movement in best performing 20 listed companies. As a result, NASI reflects the total value of all listed companies at the NSE and better reflects the market performance (NSE Press Release, 2008).

## **2.9 Problems with stock market indices**

According to Sutcliffe (2006) all stock market indices have problems but the magnitude of the problems differs from one index to another. Therefore one index may excel in some situations and fail in other circumstances where different indexes are preferred. He argues that numerous ways of constructing stock indices are used and such computations have their advantages and disadvantages. Precisely, since an index number summarizes hundreds of price movements, it is common for much information to be lost. For example, where price of each share in the index is given an equal weight in the calculation of the index, companies with high share prices do not have a disproportionate effect on the index. However, this method does not reflect the differences in sizes between companies. In addition, where construction of an index simply involves using the share prices without applying any weights, in such a price weighted index movements in share prices of companies with a high share price are likely to dominate since they will tend to change by large absolute figures. For the capitalization weighted indices, there is a likely tendency for the index to be dominated by few large firms. For example, Sutcliffe notes that on 1<sup>st</sup> August 1995, 46.3% of the value the Finnish Fox index was accounted for by Nokia alone. In move to avoid this bias (where the index is dominated by a few large firms), some stock market regulatory authorities have resorted putting an upper bound on the weight which can be given to any single company. In the recent past, some major indices have switching to using free float weights to their market capitalization indices. For indices that include both the parent and the subsidiary, Kobayashi and Yamada 2000 argue that including the two amounts to double counting. Furthermore, Arnott, Hsu and Moore (2005) argue that market cap weights give extra weights to



overpriced stocks and vice versa. They therefore propose use of fundamental weight such as sales, book value, cash flow, dividends or total employment.

On the other hand, average system method of computing indices also has its own shortcomings. Under the geometric index, Sutcliffe (2006) points about three disadvantages as follows ; one, the index underestimates price increases, that is, if the prices of all the shares in the index rise or fall by  $x\%$  percentage, equally weighted geometric index will rise or fall by the same proportion. Contrary to this where the individual share prices don't change by the same proportion, the index will underestimate price rises and overstate absolute size of a fall in share prices. Two, zero value index is a possible outcome. Computation of geometric index involves the product of all current share prices and it therefore follows that if the share price of any of the constituent share collapses towards zero, the index value will be zero. Three, the index suffers from non-normality bias in that if individual arithmetic returns are used to compute geometric index, the returns from that index will not be normal. Under arithmetic index, returns on the index are also normally distributed. Four, long term downward bias. While various studies show that share prices tend to rise in the long run by differing amounts, the value of the rise under the equally geometric weighted index is always low compared to that of the arithmetic equivalent index. This represents a serious understatement and renders geometric indices unsuitable for measuring long term price movements.

Selection bias, where some indices are not representative of the universe of shares based on the selection criteria. Selection bias can occur for two reasons; one, is due to the fact

that most indices largely comprise of leading companies in the stock market while there are several small companies on the same market. Secondly, due to the way the identity of the companies that constitute the index changes over time. Averaging bias exists in some of the indices due to first order serial correlation and some aspects of non-synchronous trading.

## **2.10 Empirical Review**

Odera (1999) carried out a study on the accuracy of the NSE stock index and established major weaknesses in the index that included lack of a clear portfolio selection and revision policy, geometric index underestimates price rises and overstates price falls and that depending on the base chosen, the percentage change in the index can be larger or smaller than the geometric index. He therefore suggested introduction of another index and careful interpretation of the NSE 20 share index.

Branch (1976) in his study on predictive power of some market indicators established that in the past there was a significant relationship between some market indicators and subsequent stock market performance. According to his study, the most successful indicators appeared to be cash position of the mutual funds and the Treasury Bill Rate. Other indicators with forecasting ability included confidence index and inflation rate. However, he cautioned that forecasting ability of one indicator is subject to changes from one period to another.

Adjasi, Harvey and Agyapong (2008) carried out a study on effects of exchange rate volatility on the Ghana stock exchange. They used secondary data on the two variables

establish the relationship between exchange rate volatility and stock market volatility. They established that there exists an inverse/ negative relationship between exchange rate volatility and stock market returns, that is, depreciation in the local currency leads to increased stock market returns in the long run and vice versa. However, in the short run it reduces the stock market returns. The study also revealed that the stock market should perform well under strong economic growth with relatively stable price levels.

McMillan and Thupayagale (2011) carried out a study on measuring the volatility in African stock markets taking into account the periodic shifts in mean level of volatility where regime shifts are determined endogenously. The study found that indeed there was persistence and long memory in volatility are overestimated when regimes shifts are not accounted for. As such, they proposed that when estimating volatility among African stock markets its important to consider the effects of regime changes as this would generate an improved volatility forecasting performance for some African stock markets.

Ngugi (2003) carried out on determinants of liquidity in stock markets with Nairobi stock exchange as the case study. The study established that, one, stock market returns heavily influenced the volume of trading activities; two, taxation policy aimed at lowering costs influences share trading while those involving taxation of dividend work against and that concentration of shares among a few shareholders reduce market liquidity.

Various macroeconomic indicators exhibit varying impacts on the stock market performance both in the short run and long run (Pilinkus, 2010). In his study comprising

the Baltic states (Lithuania, Latvia and Estonia) he established the following; one, that the impact of macroeconomic indicators on stock market index in the short and long run is different even in countries with analogous level of economic development; two, during the short run in stock market of small open speculative attacks are expected that restrict the possibilities to determine the relationship between the macroeconomic indicators and stock market index in the countries; three, in the long run the significance of dependence of the relationship between macroeconomic indicators and the stock market index increases to 99%; and finally determining the direction of the macroeconomic indicators compared with the stock market index enables to forecast the tendencies of variation of the macroeconomic environment of a country and their impact on the stock market also contributes to the formation of investors' decisions.

Price discovery for cross listed companies show that information accrued during trading in the domestic market is effectively transmitted in into the trading of the market where that share is cross listed. As a result, the domestic market plays a significant and consistent role in both price discovery and volatility spillover for a cross listed company. Information originating from the country where is cross listed tends to be temporal and short lived. The home market business environment has an overbearing effect over superior market quality in price discovery for cross listed stocks (Cheng, Guangzhong and Wu, 2010).

Chiou (2011) assessed the volatility transmission of the stock returns in Asia, Europe and North America by investigating the lead lag relationship between major stock markets. The study used Japan, UK and USA as representatives of the three continents. Key inices

in each continent were used and included Nikkei 225, FTSE 100 and S&P 500. An assessment of how intraday return behavior in one market affects intraday in another market located in a different time zone established a strong evidence that the 3 stock markets are significantly interdependent; Tokyo leads London and New York; London leads New York and Tokyo; and New York leads Tokyo and London. The study further revealed that London and New York have strong ties.

While carrying out a study on short run and long term relationship among six sectoral indices at Athens Stock Exchange (ASE) Patra and Poshakwale (2008) found out that though major sectors do not show strong and consistent long term relationship, the banking sector seems to have a strong influence on returns and volatility of other sectors at least in the short run. Decomposition analysis of the variance confirms that although the variance of returns for most sectors is influenced by their own innovations, the banking sector is able to explain about 25% of the variance in other major sectors like construction and insurance and 15% of industrial, investment and holding sectors. Given the critical role of the banking sector in the economy, changes in the sector's index can be used in predicting short term movement in other indexes.

Nishimura and Men (2010) assessed the daily and overnight spillover effect in common stock prices between China and G5 countries. The study established a strong evidence of short-run one-way volatility spillover effects from China to the US, UK, Germany, and France stock markets. Contrary to the widespread belief, the empirical results suggested that a small (China) stock market has significant influence on a large (G5) stock market

but not vice versa. The paradox was explained by the rapid growth and economic development and severe capital regulation in China.

Kithinji and Ngugi (2009) studied the stock market performance before and after general elections at NSE and they discovered that there is a significant difference in market performance for the year before and after the general elections. Volatility also appears to be lowest in the years before the elections and during the election year. Finally, they found that market performance appeared to be strongly linked to political regimes and prevailing political events. They concluded that election years should not have a major impact on the investment decisions.

## **2.11 Overview on Literature Review**

It is evident from both the theoretical and empirical review that stock indices are key indicators of a stock market performance. This has made many market players to pay keen interest on the movement of the indices. In addition to following the changes in indices, they also pay attention to market capitalization to have a feel of the actual market performance. This, therefore, implies that stock indices must be a good indicator of market performance at any given time; failure to which their relevance would disappear. From Adjasi, Harvey and Agyapong (2008) and McMillan and Thupayagale (2011) studies it is important to understand macro economic variables that affect volatility in the stock market as this will have an impact on market capitalization and resultant stock indices. It is also important to note that information given by such indices could be on the general stock market or sector based market information. Sutcliffe (2006) and Arnott, Hsu and Moore (2005) have pointed out that all stock market indices have problems

though the magnitude vary from one index to another. As a result, different indices can reinforce each other thereby giving market players finer details about a given stock market.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter outlines the research design, study population, data collection methods and sources, the empirical model and measurement of variables.

### **3.2 Research Design**

The study employs a correlation research design to determine the relationship between market capitalization and NSE stock indices. A correlation establishes whether a change (increase or decrease) in one market variable corresponds to a change (increase or decrease) in one or more variables (Mugenda and Mugenda, 2003). This relationship was done through the use of tools of regression and correlation.

### **3.3 Population and Sample**

The study used historical (secondary data) on market capitalization, the NASI and the NSE-20-Share Index obtained from the NSE quarterly publications for the period January 2008 – June 2011. The horizon of 42 months was used because it constitutes the period immediately after inception of NASI into the NSE market and is adequate sample for analysis. The population and sample comprised all the companies whose ordinary shares were quoted on the Nairobi Stock Exchange for the period under consideration.

### **3.4 Data Sources and Collection**

Data collection involved obtaining monthly secondary data on market capitalization, the NSE 20 Share Index and the NASI Index from the NSE quarterly bulletins for the period January 2008- June 2011. Monthly market capitalization data was the sum of all the counters in the NSE calculated as outstanding shares per counter multiplied by the



monthly average price. NSE 20 share index was the monthly average as computed by the formula applied by the NSE for the 20 companies that constitute the index.

Finally, the NASI monthly data incorporated all listed companies irrespective of their performance and their time of listing computed as a market capitalization weighted index.

## **CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION OF RESULTS**

### **4.1 Introduction**

This chapter presents the regression analysis results of NSE 20 Share Index, NASI (independent Variables) and Market Capitalization (dependent) which will help in answering the research questions. Data was analyzed using vector auto-regressive (VAR) analysis model which was developed by Christopher A. Sims (1980). The model specification had market capitalization and the NSE share indices as variables.

### **4.2 Correlation Test**

Correlation tests were carried out on the original data to show the extent or strength and direction of the relationship between variables. It should be noted that correlation does not show causality between independent and dependent variables. It only informs on the magnitude with which a dependent variable changes due to a unit change in the independent variable. From theory, a correlation coefficient which is close to 1 implies a strong positive (for a positive sign) relationship or strong negative relationship (for a negative sign). The signs inform on whether the relationship is positive or negative. Table 4.1 below presents the correlation matrix for the variables under study.

**Table 4.1: Correlation matrix**

MARKETCAP	NASI	NSE 20 Share
1.0000	0.813629	0.659423
0.813629	1.0000	0.964455
0.659423	0.964455	1.0000

Source: Author, 2011

From table 4.1 above, there is a very strong positive correlation (0.813629) between market capitalization and NASI and a rather strong positive relationship (0.659423) between market capitalization and the NSE. The 0.964455 correlation coefficient indicates that there was a mutually causality relationship between NSE 20 share index and NASI

The implication of these results is that, market capitalization and the NASI will more often than not move in the same direction than with the NSE 20 share index. This situation is best explained by the constituent stock counters factored in the construction of the two indices. As earlier mentioned, in the introduction chapter, NASI factors all the stocks in the NSE while NSE 20 share index only comprises the 20 blue chip stocks. As a result, NASI reflects the entire changes in stock prices. It is the respective stock price in any given day and the outstanding ordinary shares that are used to calculate the market capitalization. Therefore, NSE 20 share index maybe more volatile than the market capitalization and the NASI due to these exclusion hence the low strength of the relationship.

### **4.3 Unit Root Tests**

Time series data are often assumed to be non-stationary and it is, therefore, necessary to perform a pre-test to ensure there is a stationary-co-integrating relationship among the variables to avoid spurious regression. The standard practice in time series literature, therefore, obliges a check for unit roots in each series before estimating any equation.

This study used the Augmented Dickey Fuller (ADF) test in delivering the unit root test. The decision rule for the ADF test is that the null hypothesis is rejected if the calculated t-statistic is greater than the t critical.

Table 4.2 on below presents the results for the unit root test at different critical value levels.

**Table 4.2: Unit root test at various critical levels**

<b>Variable</b>	<b>ADF Statistics</b>	<b>1% critical value</b>	<b>5% critical value</b>	<b>10% critical value</b>	<b>Comments</b>
MARKET CAPITALIZATION	-2.4616	-4.2092	-3.5279	-3.1949	Non stationary
NASI	-1.7073	-4.2092	-3.5279	-3.1949	Non stationary
NSE	-1.71117	-4.2092	-3.5279	-3.1949	Non stationary

Source: Author, 2011

Given that the ADF statistics for the three variables are greater than the respective t-critical values at 1%, 5% and 10%, the data was not stationary and the first difference did not make it stationary either.

The second difference was carried out for the same variables and its ADF is presented in the next page.

**Table 4.3: Unit root test at second difference**

Variable	ADF Statistics	1% critical value	5% critical value	10% critical value	Comments
MARKET CAPITALIZATION	-5.31225	-4.2242	-3.5348	-3.1988	Stationary
NASI	-5.69111	-4.2242	-3.5348	-3.1988	Stationary
NSE	-6.18614	-4.2242	-3.5348	-3.1988	Stationary

Source: Author, 2011

All the variables are stationary after second difference given that ADF statistics is smaller than the respective t-critical values. Regression results from such stationary data have economic meaning and can be used to inform policy making and analysis.

Once stationality of the variables was established, regression was carried out to analyze the relationship and significance of the independent variables in explaining variations in dependent variables.

#### 4.4 Regression results

Table 4.4 below presents the regression results for the variables under study.

Dependent Variable: DLOGMKTCAP				
Method: Least Squares				
Date: 10/02/11 Time: 21:35				
Sample(adjusted): 2008:02 2011:06				
Included observations: 41 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNNSE	1.210531	0.13085	9.251295	0
DLNNASI	0.007471	0.006498	1.149675	0.2575
C	-0.0311	0.028758	-1.08127	0.2864
R-squared	0.694538	F-statistic	43.20082	
Adjusted R-squared	0.678461			

Source: Author, 2011

From the regression results above, NSE was found to be significant in explaining market capitalization while NASI was not with NSE having a coefficient of 1.210531 compared to the NASI 0.007471. This means that NSE will explain most of the changes in market capitalization compared to NASI. A t-statistic of 9.251295 indicates the unlikelihood of the actual value of the estimated parameter being zero compared to NASI's 1.149675; the larger the absolute value of t-statistic, the less likely that the actual value of the parameter could be zero.

The regressors were found to explain 67.85% of the variation in the dependent variable as postulated by Adjusted R squared. Jointly, all the variables were found to be significant as evidenced by the F-statistic of 43.2% which test the overall significance of the model.

Given that regression seeks to show the suitability of predicting one variable from the other, it therefore, follows that the variables used in this study are suitable in explaining the change thereof as indicated by the high value of adjusted R squared of 67.85%. This in essence shows that a strong relationship between the variables exists.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Summary and Conclusions**

The study examined the relationship between market capitalization and stock indices at Nairobi Stock Exchange. Regression analysis was used to establish the nature of relationships of variables under the study. The study was motivated by the need to establish how the two stock indices and NSE relate with market capitalization, especially after the late introduction of the second index, that is, NASI. These indices are intended to improve efficiency in dissemination of stock market information as well as gauging investors' sentiments at NSE from time to time. Historical data on market capitalization, NSE 20 Share Index and NASI was obtained from the CMA annual reports and quarterly statistical bulletins for the period January 2008 – June 2011.

Correlation matrix for the three variables shows that there is a very strong positive correlation between market capitalization and NASI of 0.813629 (correlation coefficient) and a strong positive relationship between market capitalization and the NSE of 0.659423. On the other hand, correlation coefficient between NASI and the NSE 20 share index indicates a very strong positive correlation meaning that they move together in the same direction.

Unit root test for the data revealed presence of unit root at levels by giving ADF statistics for the three variables (market capitalization, NASI and NSE) greater than their respective t critical values at various levels (see table 4.1 and 4.2) while the second difference established stationarity on the data by having their ADF statistics smaller than the respective t critical values (see table 4.3). From the regression results, NSE was found to be significant in explaining market capitalization while NASI was not. The

explanatory variable was found to explain 67.85% of the variation in the dependent variable. Jointly, all the variables were found to be significant as postulated by the F-statistic where about 43% of the regressors explain variations in the dependent variable.

## **5.2 Recommendation**

From the research findings, it is evident that stock market indices play an important role in explaining variations on market capitalization. From the analysis made in the previous chapter, various recommendations can be made. There is need for users of stock indices to understand their computations and constituent counters in any given stock exchange. For example, the NSE 20 share index appears to be more significant in explaining variations in market capitalization which could be attributed to the fact that the 20 counters that constitute the index account for over 80% of the total turnover at the exchange on any given day. This has the likelihood to present a strong co-movement between the market capitalization and the NSE 20 share index as opposed to NASI which involves all the counters including the least traded. Inclusion of the least traded counters in the computation of the index results in smoothening out of the variations or the volatility of the stock market. As a result, NSE needs to address that selection bias and related anomalies in the indices.

## **5.3 Limitations of the Study**

The study only concentrated on the relationship between market capitalization and stock indices at NSE. As such, accuracy and reliability of the historical data used to generate results for the study is only correct as captured in the data sources as any rounding off is known to greatly affect the outcome of the indices. The data used was only for the period



January 2008 to June 2011. It is possible that data for the three variables for different time periods may give slightly differing results especially where business cycles vary from the one in the period under study.

#### **5.4 Areas of Further Research**

The findings of this study are only confined to the relationship between market capitalization and stock market indices. Based on these findings further research can be done to determine that relationship between the variables under different business cycles. This study examined the relationship and the extent of the relationship of the variables under study for a period of three and half years only; A further study can be done to determine whether such relationship will hold in longer period. In addition, effects of equity turnover on market capitalization can also be studied and its impact on the indices established.

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## APPENDICES

### Appendix 1: Market Capitalization, NSE 20 Share index and NASI Data

Year/ Month	Market Cap In Billions	NSE 20 SHARE INDEX	NASI
<b>2008</b>			
JAN	777.10	4712.71	90.55
FEB	830.60	5072.41	98.6
MAR	781.70	4843.17	94.64
APR	908.20	5336.03	107.78
MAY	916.80	5175.83	108.82
JUN	1,230.70	5185.56	112.11
JUL	1,122.20	4868.27	101.74
AUG	1,102.00	4648.78	97.54
SEPT	972.30	4180.40	87.75
OCT	764.76	3386.65	68.84
NOV	791.41	3341.47	71.28
DEC	853.67	3521.18	73.37
<b>2009</b>			
JAN	777.50	3198.90	67.17
FEB	611.50	2474.75	52.82
MAR	688.70	2805.03	59.49
APR	683.00	2800.10	58.86
MAY	693.40	2852.57	59.75
JUN	821.80	3294.56	70.96
JUL	826.80	3273.10	71.43
AUG	785.30	3102.68	67.79
SEPT	771.60	3005.41	66.73

OCT	783.97	3083.63	67.68
NOV	825.83	3189.55	71.29
DEC	831.83	3247.44	71.64
<b>2010</b>			
JAN	910.00	3565.28	78.15
FEB	922.00	3629.41	79.18
MAR	983.00	4072.93	84.43
APR	1,062.00	4233.24	90.13
MAY	1,073.00	4241.81	92.33
JUN	1,109.00	3995.64	95.1
JUL	1,143.00	4438.58	97.74
AUG	1,136.00	4454.59	95.93
SEPT	1,174.00	4629.80	98.92
OCT	1,222.00	4659.56	102.36
NOV	1,169.00	4395.17	98.01
DEC	1,167.00	4432.60	97.82
<b>2011</b>			
JAN	1,192.00	4464.92	99.02
FEB	1,177.00	4240.18	96.66
MAR	1,090.00	3887.07	89.5
APR	1,155.00	4029.23	94.18
MAY	1,144.00	4078.10	93.21
JUN	1,121.00	3968.12	90.6

Source: Capital Market Authority

## **Appendix 2: NSE 20 Share Index Firms**

1. Rea Vipingo
2. Sasini
3. Kenya Airways
4. Centum
5. Nation Media Group
6. Safaricom
7. Barclays
8. Equity
9. Kenya Commercial Bank
10. Standard Chartered Bank
11. Co-operative Bank
12. East African Breweries Ltd
13. Athi River Mining
14. Mumias Sugar
15. Bamburi Cement
16. British American Tobacco
17. Kengen
18. Kenya Power
19. Kenol Kobil
20. Express & CMC Motors

Source: Capital Market Authority