

**INVESTOR SENTIMENT AND EQUITY MARKETS:
EVIDENCE FROM KENYA**

MOHAMED HILAL ABDULLAHI

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DECLARATION

This is my original work and to the best of my knowledge this paper has not been presented for the award of a degree in any other university.

MOHAMED HILAL ABDULLAHI

SIGNATURE: .....

DATE: 01/11/2013.....

This paper has been submitted for the award of the degree of Master of Arts in Economics with our approval as university supervisors.

MS. SUSAN A. AYAKO

.....

DATE

4/11/2013.....

DR. SAMUEL M. NYANDEMO

.....

DATE

4/11/2013.....

DEDICATION

I dedicate this paper to my family for the support, understanding and for affording me ample time to study for the program. Finally, I dedicate this work to my nieces Hamun, Hamdi, Hafsa and Hanan so that it serves them as an encouragement to work hard and excel in school.

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Despite all the valuable assistance, the viewpoints expressed herein are my own and do not represent the views of the person(s) and/or institution(s) mentioned in the study. I am solely responsible for any errors and/or omissions in this paper.

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ABBREVIATIONS AND ACRONYMS

ADF	Augmented-Dickey Fuller
APT	Arbitrage Pricing Theory
ATS	Automated Trading system
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
DF	Dickey- Fuller
ECM	Error Correction Method
EMH	Efficient Market Hypothesis
GDP	Gross Domestic Product
ICF	Investor Compensation Fund
NSE	Nairobi Securities Exchange
NASDAQ	National Association of Securities Dealers Automated Quotations
OLS	Ordinary Least Squares

OPERATIONAL DEFINITION OF TERMS

Advance – Decline Ratio	The number of stocks that have traded at a higher price relative to their previous trading price divided by the number of stocks that have traded at a lower price compared to their previous trading price
Equity Market	Markets for quoted equities or listed shares.
Gross Domestic Product	The market value of all officially recognized final goods and services produced within a country in a given period of time, usually one year.
Market Capitalization	This is the total value of the issued shares of the publically traded companies.
Size Premium	The tendency for the returns of small company shares to be higher than the returns of large company shares
Short Selling	The practice of selling securities or other financial instruments that are borrowed, with the intention of subsequently repurchasing them at a lower price
Value of Shares Traded	This is the total number of shares traded multiplied by their respective matching prices during a given period of time, usually a day
Volume of Trading	The total number of shares traded during a given time period

ABSTRACT

This study investigated the relationship between investor sentiment and performance of quoted equities in Kenya. The study has three specific objectives which include; to determine the relationship between investor sentiment, represented by value of shares traded, and performance of the NSE equity market; to determine the relationship between investor sentiment, represented by volume of shares traded, and performance of the NSE equity market; and to draw policy recommendations from the research findings. The aim of the study is to provide policy makers and the academic community with knowledge of the relationship between investor sentiment and equity market performance.

The study used two proxy measures of investor sentiment against market capitalization as an indicator of stock market performance. The two proxies for investor sentiment include the volume of shares traded and value of shares traded. This study used quarterly time series data for the period between 1996 and 2013. The study employed the augmented Engle and Granger Co-integration test and the Error Correction Model.

The empirical results indicate the existence of both long-run and short run relationships between the indicators of investor sentiment and stock market performance. The study therefore recommends that investor confidence in Kenya be developed further to expand market capitalization.

CHAPTER ONE

INTRODUCTION

1.1 Background

The market for listed shares, also known as the market for quoted equities, is one of the most crucial areas of a market economy because it provides firms' with access to capital and investors a part of ownership in a firm with the potential to realize gains based on its future performance. It performs various economic roles including interchange, hedging, speculation and investment opportunities. The market for quoted equities also serves as a price revealing mechanism and propagates information while providing the means for raising capital for firms (Kithinji and Ngugi, 2010).

Equity market performance draws interest from many stakeholders including economists, financial analysts, general public, investors, securities exchanges and government functionaries (Kithinji and Ngugi, 2010). The interest of economists has been drawn to whether performance of quoted equities is determined solely by their fundamentals or instead by both their fundamentals and the valuation of irrational investors (Baker and Stein, 2004).

Fundamental analysts believe that, at any time, there is a true value for the aggregate stock market, various businesses, or individual securities and these values depend on underlying fundamental factors (Reilly and Brown, 2005). Therefore, investors should determine the fundamental value of an investment asset at a point in time by examining the variables that determine its value such as current and future earnings or cash flows, interest rates, and risk variables. If the actual price that is prevailing in the stock market is sufficiently different from the estimated fundamental value by enough to cover transaction costs, investors should take

appropriate action. Buy strategy is actioned if the market price is substantially below the economic price and sell strategy if the market price is above the economic price (Reilly and Brown, 2005). Investors that use fundamental valuation for investment decision-making also hold that the prevailing security prices and their economic prices at times vary but in the long run market participants discover the anomaly and take appropriate actions to correct the difference (Marianna, 2008).

Standard finance theories such as capital asset pricing model (CAPM), intertemporal capital asset pricing model (ICAPM), and arbitrage pricing theory (APT) are based on the supposition that capital markets are effectual (Bathia and Bredin, 2006). These theories assume that investor sentimentality does not play a critical role in asset pricing. It argues that prices of stocks will match their factual value, economic price, because of the effect of the stockholders who are rational. It also holds that arbitrageurs play their fair role by reducing the variations in stock prices that may have been caused by the activities of investors who are irrational (Bathia and Bredin, 2006). Arbitrageurs are defined as investors who attempt to profit from price misalignments in the market by making simultaneous trades that cancels each other, thereby earning risk free returns.

Effectual financial markets, also known as informationally efficient markets, is defined as a market where security prices include and echo the arrival of new information quickly due to the actions of the investors who are rational (Chartered Financial Analyst Institute, 2013). One of the main assumptions underlying efficient markets is that investors are rational economic humanoids who are always in pursuit of self-centred endeavours and make investment decisions that are based on optimality. It also assumes that investors have rational outlooks. The combined effect of these two suppositions mean that, on average, investors' decisions are fairly correct. The

hypothesis also assumes that the emergence of a new and relevant information enables investors to apprise their prospects regularly. Another important plank of the efficient market supposition is that new and relevant information is obtainable to all investors at no extra cost (Chartered Financial Analyst Institute, 2013). Competition among participants results in a market where prices of individual investments always reflect the total effect of all information - including information about events that have already happened and the events that the market expects to happen in the future. On overall, the efficient market hypothesis holds that the prevailing prices of securities will always equal the true value of that security. Given this perspective, therefore, it can be observed that no one investor can be able to make excess or abnormal returns from investment trading regularly.

The history of equity markets is full of studied events that have received their own designations: the equity market bang of 1929, the market thrive of the 1960s, and the dark Monday of October 1987. All these occasions refer to a stagy change in equity markets' values that defy traditional finance valuations. The classical finance theory where rational and dispassionate investors push equity market values to match the discounted value of projected future net cash flows cannot apt into the stagy changes in equity market values (Baker and Wurgler, 2006).

The stock market bang of 1929 cost Fisher much of his academic standing and a great deal of his affluence. He foretold, a few days before the crash that "stock prices have reached what looks like a permanently high plateau", (Mcgrattan and Prescott, 2004). What followed was a precipitate decline in the values of quoted equities motivating him to state "the market was only shaking out of the lunatic fringe", (Mcgrattan and Prescott, 2004). He further declared that the security "prices still had not caught up with their real value" and therefore could be expected to go even much higher. In contrast, John Maynard Keynes upon learning of the stock market crash

of 1929, commented that “the extraordinary speculation on Wall Street in the previous months has driven up the rate of interest to an unprecedented levels” (Mcgrattan and Prescott, 2004). It is significant to note the phrases used by these imminent economists; “only shaking out of the lunatic fringe and the extraordinary speculation on Wall Street.” The phrases indicate a role for irrationalities to influence the behaviour of equity markets.

After the Dow Jones had surpassed the six thousand mark, in October 1996, Greenspan eminently posed the question “how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions?” (Greenspan, 2007). He further commented that “the richest investors are allegedly those best at gauging shifts in human psychology rather than at forecasting earnings per share of a company” to underline the role of investors’ psychology in influencing market behavior (Greenspan, 2007).

In the sunset of 1980s, a new arm of financial economics, known as behavioral finance, has been added to the combination to supplement the traditional finance theory. Behavioral finance reflects how various psychological personalities affect the ways that individuals or groups act as investors. As noted by Katalin (2008), behavioral finance advocates recognize that standard finance theory, which is founded on rationality, can be applied validly within certain limits but assert that it is not a model that is comprehensive since it does not consider investors’ real conduct. Specifically, according to Olsen (1998), “behavioral finance aims to examine and forecast reliably financial market outcomes that are based on decisions arrived through psychosomatic process”. It is focused on the application of psychology and economic philosophies to finance in examining investor behavior.

The behavioral finance methodology is founded on two main premise: Investors are always emotional and applying investment strategies that are contrary to those of investors driven by feelings is not only expensive but also perilous (Baker and Wurgler, 2006). This new approach postulates that investors who are rational cannot thrust equity market prices to equal their economic price as the classical finance theory would like us to believe. It further contends that arbitrageurs who benefit from mispricing of equity market values face limitations to arbitrage trading. Behavioral finance focuses on market sentimentality as a major determinant of asset pricing, which in turn is derived from methodical errors in judgment committed by investors. It asserts that investor sentimentality causes asset prices to diverge from values determined using traditional finance approaches. Sentiment in the equity market is defined as the bearishness or bullishness of the market participants that is not founded on economic fundamentals (Baker and Wurgler, 2006).

In the modern history, equity market has provided incidences such as the internet fizz and the National Association of Securities Dealers Automated Quotations (NASDAQ) crash that support the suppositions of behavioral finance. During this period, investors' extreme hopefulness drove stock prices, especially those speculative in nature, to unconceivable levels in the 1990s. This caused many investors, in particular those who deployed contrarian strategies, lost their fortunes in a short period as stock prices increased unabatedly before an eventual crash (Baker and Wurgler, 2006).

1.2 The Equity Market in Kenya

The Kenyan securities exchange has existed since the 1920s; however, it was formalized when the Nairobi Stock Exchange was formed in 1954 as a voluntary organization of stock brokers. It is now referred to as Nairobi Securities Exchange (NSE). It is one of the most active equity

markets in Africa. It was ranked the fourth largest market for quoted equities in Africa in terms of volume of shares traded and fifth in market capitalization as a percentage of Gross Domestic Product (GDP) in the year 2011 (Mukulu, 2012). The NSE is also a market for quoted debt instruments and plans to be a market for listed hedge instruments (<http://www.nse.co.ke>).

With the current trading system, trading takes place on Mondays to Fridays from 9.00 a.m. to 3.00 p.m. except for public holidays or any other day closure is ordered by the Board of Directors of the NSE. Potential buyers and sellers contact stockbrokers or investment banks directly or indirectly through registered agents and give their buying or selling orders. Trading board lot is in terms of one hundred shares or units (Ngugi, 2003). There are daily limits on movements of quotations set at 10% of opening bid or offer prices. The current settlement cycle of T+3, transaction date plus three working days, lengthens the financial transaction period. Such a long period of trading cycle implies that investors waste a lot of time which adversely affects the liquidity and efficiency of the market.

The NSE and its management have in the recent past come under sharp criticisms for being an exclusive club. Presently, the bourse is tightly controlled by twenty one members composed of fourteen stock brokers and seven investment banks. Apart from the founder brokers of the NSE, seven more stock brokerage firms were licensed in July 1994 for the first time in the history of the NSE and an additional eight brokers were licensed in June 1995 (Ngugi, 2003). Expansion of brokerage firms enhance competitiveness in trading and reduce transaction costs. The allure of the tight NSE membership is underscored by the fact that the NSE offered a single executive seat for a price of USD 4.5 million to Renaissance Capital on August 3, 2007 to take the executive seat previously occupied by Francis Thuo and Partners (<http://www.nse.co.ke>). To enhance transparency and perhaps to debunk the growing perception, the NSE stakeholders embarked on

a process of demutualization in the year 2009 (Njiinu, 2012). Four years down the road, little has been achieved on this process.

In the 1980s, the government of Kenya undertook institutional reforms geared towards viable economic growth with an efficient, effective and steady capital markets (Kithinji and Ngugi, 2010). Through these efforts, a regulatory body called Capital Markets Authority (CMA) was formed in 1989, to assist in the creation of an environment conducive to the growth of the country's capital markets (Matu, 2007). The role of the CMA also includes development of the capital market which calls for ensuring the availability of diversified financial assets and attracting high number of companies to list at the Securities Exchange.

Whether the CMA has achieved its mandate remains debatable (Njiinu, 2012). Stock brokerage and investment banking services have not diversified into the rural folk and still remains only an urban affair. The nearest the equity market came to rural diversification was when some stockbrokers, who have now run into financial problems, opened upcountry branches during the much hyped Kengen and Safaricom IPOs. Four stock brokers went under in quick succession with seemingly no tangible action from the CMA. Francis Thuo and Partners went under in early 2007, followed by the collapse of Nyaga Stockbrokers in 2008, Discount Securities in 2009 and Ngenye Stockbrokers was put under statutory management in 2010 (<http://www.cma.or.ke>).

The collapse of the stock brokerage firms was largely blamed on lack of proper management and poor corporate governance (Njiinu, 2012). The poor corporate governance originates from the fact that most stockbrokerage firms are family owned businesses with little or no regard for good management practices (Mwaura, 2006). It is also believed that the CMA has failed to shield investors from financial losses arising from the collapse of stockbrokerage firms. Many people

hold that after Francis Thuo and Partners went under in 2007, the regulator did nothing to prevent the collapse that ensued the following year of Nyaga Stock Brokers (Mwanza, 2008). To conclude on this indictment of the CMA, it stands accused of being a weak regulator with deficient laws and lacks effective regulations to govern market intermediaries (Musau, 2006).

The myriad of weaknesses and challenges notwithstanding, the burgeoning activities of the equity market in Kenya has gained increased importance for the economy. The market has experienced a relative boom in depth and size; there has been a remarkable growth in the volume of shares traded and positive increase in market participation especially with respect to initial public offers (Matu, 2007). This has led to a steady rise in investors' wealth at the bourse putting some of the investors in exclusive clubs of paper billionaires. Many people see the equity market to be the shortest route to fortune in Kenya (Kithinji and Ngugi, 2010). The significant role played by the equity market in Kenya cannot be overemphasized particularly in the privatization of state owned enterprises (Mukulu, 2012).

1.2.1 The NSE Equity Market Performance

The performance of the equity market is swayed by a number of factors including the perception of market participants and the general health of the economy. Some measures of the performance of quoted equities in Kenya include; market capitalization, market turnover and NSE 20-share index (Kithinji and Ngugi, 2010). Market capitalization is one of the popular measures of the performance of quoted equities in Kenya. Since investments are held in various asset classes it becomes difficult to monitor the growth of each and every asset. It is therefore easier to monitor the entire market assuming that your investments moved in tandem with the aggregate market (Kithinji and Ngugi, 2010). Therefore, this study focuses on the market capitalization as a measure of equity market performance.

Table 1.1 provides some measures of the equity market performance in Kenya for selected years. As can be observed from the table, the market has posted the highest return in 2006 during the period between 2005 and 2012. The good performance in 2006 is mainly attributable to the installation of Automated Trading Systems (ATS) which has removed inadequacies in settlement of trades thus enhancing true pricing in the market. It is argued that true pricing, one which is in sync with fundamentals, enhances the functions of the capital market in disseminating information to the market participants (Ngugi, 2003).

Table 1.1: Selected Performance Indicators for the NSE between 2005 and 2012

	2005	2006	2007	2008	2009	2010	2011	2012
NSE 20 Share Index	3,973	5,646	5,445	3,521	3,247	4,433	3,205	4,133
NSE Growth rate (%)	35	42	-4	-35	-8	36	-28	29
Market capitalization	6,384	11,378	13,387	10,917	10,756	14,461	10,203	14,791
Equity Turnover	505	1,300	1,318	1,438	497	1,084	878	1,009

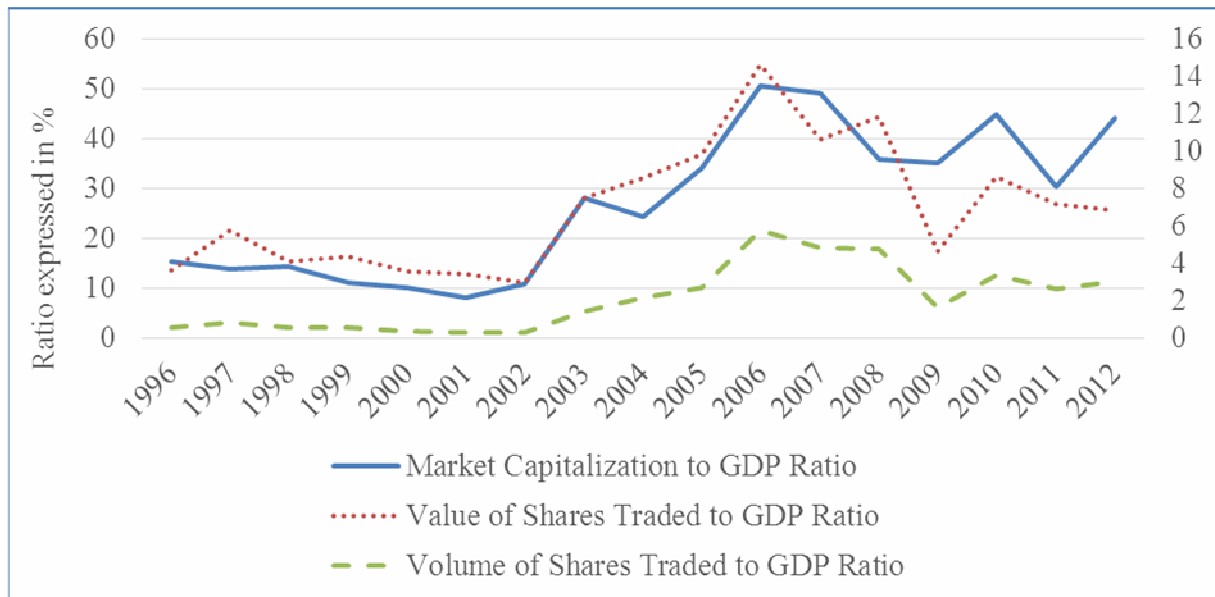
Source: NSE Reports; Market capitalization and turnover are in millions of USD

Figure 1.1 plots the relationship between market capitalization, volume of trading (volume of shares traded) and value of shares traded (turnover) for the period between 1996 and 2012. All the indicators are expressed as a percent of GDP. From 1996 to 2012, the equity market performance in terms of market capitalization reached an all-time high of 50% in 2006 and a low of 8% in 2001.

As can be seen from the figure 1.1, the indicators generally appear to move together closely, though there is pronounced break in 2009 between the indicators of stock market liquidity (volume of trading and turnover) and market capitalization. The pronounced break in 2009 roughly coincides with the global financial crisis and therefore the decline of the volume of

shares traded and turnover during this period can be mainly attributed to the run-away sentiments following the global financial crisis and the after-shocks of 2007/2008 post-election violence in Kenya.

Figure 1.1: NSE Market Capitalization, Volume of Trading and Turnover for 1996 to 2012



Source: the NSE Reports

The ratio of market capitalization to GDP is used to determine whether an equity market on aggregate is undervalued or overvalued. It is indicated that when this ratio expressed in percentage terms is greater than 100% it shows the market is overvalued, while a value of 50% and below, it is said to show undervaluation (<http://www.investopedia.com>). In the case of Kenya, this indicator has not crossed the 50% mark except for the one-off hump in 2006. Therefore, does it mean the NSE equity market has been undervalued since the 1996?

1.3 The Problem Statement

The performance of our stock market has been random over the years and many financial analysts have been trying to call its bottom-line to determine which direction it will take but failed, because apparently, the stock market is like a pendulum, swinging daily in different

directions at the behest of various market dynamics. Hence, the question of what determines stock market performance becomes important. To that end, little work has been done on the role of investor sentiment in the performance of quoted equities in Kenya. Therefore, this study aims to fill the gap of knowledge by seeking to answer the research question: What role does investor sentiment play in the performance of quoted equities at the NSE?

1.4 Objectives of the Study

The broad objective of this study is to determine the relationship between investor sentiment and performance of the NSE equity market. The study is based on two alternative measures of investor sentiment and market capitalization was used to measure stock market performance.

The specific objectives of the study are:-

- i. To determine the relationship between investor sentiment, represented by value of shares traded, and performance of the NSE equity market.
- ii. To determine the relationship between investor sentiment, represented by volume of shares traded, and performance of the NSE equity market.
- iii. To draw policy recommendations from the research findings.

1.5 Justification of the Study

The research study aims to make a contribution to understanding a field that is of interest to economists, financial analysts and the investing public all alike. It adds to the existing literature on investor sentiment in equity markets.

A further justification of this study is based on the fact that our capital markets suffer from waned investor confidence. Investors determine the rate at which capital markets develop and without their confidence, capital markets will have no meaningful depth. Run-away sentiments in the capital markets have the potential to send wrong signals to other macroeconomic variables in

the economy. With this study, therefore, it is hoped that, by elucidating the role of investor sentiment in the equity markets, capital market stakeholders will have a better understanding on the significance of investor sentiment and as a result help restore the waned investor confidence in our capital markets. Better understanding of investor sentiment might also improve the standard method of estimating fundamental market betas, which is a critical factor in the practice of long-term capital budgeting, that do not account for investor sentiment.

Lastly, the poor management of the capital markets leading to the successive collapse of four stock brokerage firms has been highlighted as one of the challenges facing the Kenyan capital market. Further highlighted are the growing concerns on the exclusive ownership of the NSE. Given these challenges, the study sought to unravel the role of investor sentiment in the performance of quoted equities in Kenya.

1.6 Scope and Organization of the Study

The study covers the field of capital markets specifically on investor sentiment and equity markets. The scope is limited to the Kenyan capital market.

The rest of the research study is organized as follows; Chapter two reviews literature, both theoretical and empirical. The third chapter explains the methods, procedures and data that were used in the study to answer the research question. Chapter four focuses on the empirical analysis of the data employed in the study aimed to examine the relationship between investor sentiment and performance of the NSE equity market. Chapter five contains the summary and conclusions of the findings of the study on the relationship between the measures of investor sentiment and NSE equity market performance. It also puts forth the policy recommendation of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature, both theoretical and empirical. Theoretical literature will look at theoretical underpinnings of investor sentiment in equity markets while empirical literature will look at empirical works done by previous researchers regarding the role of investor sentiment in equity markets. This is followed by an overview of the reviewed literature.

2.2 Review of Theoretical Literature

With its simplifying assumption of rational investors and effectual markets, traditional finance has gained wide reception among academics and investment specialists as a guide to financial decision making. Over time, however, the limitations of traditional finance have become increasingly apparent. Investment decision making is not nearly as impartial and intellectually rigorous and financial markets are not always as lucid and efficiently valued as traditional finance assumes (De Long et al., 1990). To bridge this gap between theory and practice, behavioral finance considers the actual pattern of investors' behavior without trying to validate or justify them. It therefore contends that the pessimism or the optimism of investors that is not founded on economic fundamentals affect equity market performance.

De Long et al. (1990) developed a behavioral finance model that classified investors into rational and irrational investors. They argued that the rational investors are arbitrageurs and are free from sentiments while the irrational investors are prone to market sentiments. Both group of investors compete in the market and all together determine equity market prices. However, they point out that rational investors do in practice face limitations to trading. Among the limitations include: the cost of information, the cost of trading, limits to arbitrage and short selling restrictions. Short

selling is defined as the selling of investment securities that are rented with the objective of buying them back at a reduced price. Short selling strategy permits an investor to rent another investor's shares and sell them if the expectation is that the stock prices will decrease, purchase them back at the reduced price and return back the shares to the original owner while keeping the difference. Investors who are risk takers also gamble on anticipated stock price increases by borrowing funds to buy shares and sell them at a higher price that will cover the principal and the cost of borrowing. Both strategies can magnify the returns and the losses of the investor because of the underlying leverage.

In the NSE market, short selling is practiced informally by the high net-worth individuals and institutional investors in cahoots with market intermediaries under the pretext of market making. However, an initiative to formally introduce short selling of securities at the NSE is being worked on by Kenya's Central Depository and Settlement Corporation (CDSC annual report). The introduction of short selling requires the joint effort of all government agencies in reforming the institutions of governance, changing the existing laws and implementing the new ones that come with the short-selling.

In the model of DeLong et al., deviation from the fundamental values arises due to irrational investor sentiment and/or the limitations faced by the rational investors that prevent them from taking full advantage of arbitraging opportunities brought about by mispricing. Investors in the NSE equity market face similar limitations as those cited by De Long and others. Some of the limitations faced by investors at the NSE include: restricted trading hours of between 9.00a.m. and 3.00p.m from Mondays to Fridays, limitations of board lots to 100 shares and the long settlement trading cycle of T+3. Given these limitations to trading and/or changes in irrational

investor sentiment, the prices of quoted equities at the NSE may not always be at their economic or fundamental values.

Ngugi (2003) provided a novel perspective on why price of investment securities might diverge from their true values. She argued that investment assets might stray from their true values due to absurdities in the market for quoted equities, including investment transactions that is not informed by market research, which is also known as “noise trading”. She further postulated that the disclosure of information by stakeholders improves equity market efficacy by giving market participants cost-free information which guarantees productivity of the stock market. Such kinds of investment transactions affect the optimal distribution of resources among contending firms. Therefore, it is vital that rules of disclosure are secured, particularly for the benefit of foreign investors who need true pricing.

Matthias et al. (2010) discussed two main fundamentals of the application of psychology to finance: namely; restricted arbitrage and trader emotions. According to Matthias and others, sentimentality in the stock market is mostly determined by dualistic occurrences: “representativeness heuristic”, which is the propensity of persons to interpret occasions as illustrative of certain precise lessons and disregard the rules of likelihood in the process, and “conservatism”, which drives persons to a sluggish apprising of models with the arrival of new information than is required. Matthias and others also argued that equity securities that have had long record of good news tend to be overvalued and their valuations, on average, revert to mean and the converse is true for equity securities that have had long record of bad news. They suggest that “representativeness heuristic” and “conservatism” cause market participants to over-react and/or under-react to news affecting the stock market.

Daniel et al. (1998) inspired another model. Their model states that investors in the equity market have overconfidence in their noisy private signals about the potential future dividends of the companies quoted at securities exchange. The model further contends that investors' overconfidence in their private signals cause equity markets to be overvalued when the noisy private signal is positive and to be undervalued when the signals are negative.

Study on sentimentality in equity markets also draws inspiration from the models of Mathias et al. (2010). They propose that where certain investors transact on the basis of "noise signals", that is not associated with material information, then security prices may vary from fundamental price, thus breaching the hypothesis of efficient markets. This viewpoint echoes that the interaction amongst investors who trade on "noise signals" and arbitrageurs creates equity market values (Shleifer and Summers, 1990). This is different from the hypothesis of efficient markets which holds that the prevailing price of a security strays minimally from the discounted values of projected future earnings, and arbitrageurs absorb market tremors and changes in the emotions of investors.

Baker and Stein (2004) developed a theory to elucidate the link between stock market liquidity and equity market returns. Their concentration was on understanding how time-variation in stock market liquidity, either at the company level or for the aggregate market, may predict variations in stock market returns. Their model lies on dual suppositions: one, there exist a group of investors who are irrational and do not react to the signals contained in trade order flows. The existence of the investors who are irrational reduces the price influence of transactions, consequently enhancing liquidity. Second, constraints to short selling which suggests that investors who are irrational will only be present in the stock market once their estimates are greater than those investors who are rational. Once the feeling of sentimental investors is

optimistic, then the stock market will be over-valued. Conversely, once the irrational traders' sentiment is adverse, the constraints to short selling prevents them from the stock market altogether. Given that the traders who are irrational make the stock market more volatile, indicators of liquidity give a signal of the relative existence or non-existence of these investors. Therefore, the most important take-away from this model is equity market liquidity can be a proxy variable for investor sentiment.

In the Kenyan case, the short-sale-constraint assumption of Baker and Stein holds. Short sale transactions are not explicitly permitted under the laws governing the capital markets in Kenya. This circumstance severely limits the ability of investors to express negative sentiments on a market-wide basis. An investor has two practical alternatives in the NSE equity market when trying to express a negative sentiment. They have the option to sell shares currently held, or if they already hold nothing they can decide not to buy. The option to sell shares short is practically difficult for individual investors due to the limited knowledge of investors on short selling in Kenya.

Kithinji and Ngugi (2010) discussed a simple concept that alleges the psychology of investors affect equity market performance. They cite Mendelson and Robbins (1967) who argued the mind-set of investors in the equity market is usually idiosyncratic, prejudiced, and persistent and therefore, the indeterminate mass response of persons to activities influencing the equity market is a factor that affects equity market performance. A comparatively minor equity market spell instigated by a squirt in corporate actions might produce an upsurge of purchasing fervour that increases prices of securities to unconceivable levels. The blind optimism of investors who trust equity market prices will increase indefinitely might yield considerable stock market progress that is not vindicated by fundamental economic considerations. Equally, prevalent investor

pessimism produced by irrational investors might push equity market prices to heights that seem unfounded on fundamentals. As a basis for their argument, they cite the assertions of John Maynard Keynes, who they claim to have asserted “specialised investors are worried not with what an investment security is worth to a person who purchases it for keeps, but with what the stock market will price it, under the effect of mass thinking, three months or even years later”, (Kithinji and Ngugi, 2010).

Calderon-Rossell (1991) established a basic model of equity market growth. Their model demonstrates that economic progress and liquidity of the stock market are the determining factors of equity market growth. The essential take-away from this model is that equity market performance, represented by market capitalization, is the consequence of the joint outcome of economic growth and stock market liquidity. According to Yartey (2008), this model represents the most comprehensive effort to advance the basis of an economic theory for equity market performance.

2.3 Review of Empirical Literature

Commonly cited studies on investor sentiment in the equity markets emerged in the late 1980s. Most of those studies were mainly empirical in nature examining whether the aggregate equity market deviated from its intrinsic or fundamental value. The early researchers were interested to discover whether the equity markets reverted to its mean, whether volatility in the equity market could be explained by changes in the underlying fundamentals and how the equity market performance could be predicted based on its past behavior using traditional valuation ratios (Fama and French, 1989; Campbell and Shiller, 1988). In these pioneer studies, the impact of investor sentimentality in the equity markets did not appear clearly and the empirical results did not report robust associations.

The application of the behavioral finance models started with studies investigating the relationship between equity market prices and macroeconomic variables. Cutler et al. (1991) investigated changes in equity prices in relation to new information on macroeconomic indicators. They found that new information on macroeconomic indicators could only explain a third of the changes in equity market returns. They also found that news such as news on wars or on changes in financial regulatory regimes or on changes in economic policies explain in part but not all of the changes in equity market returns. The findings in this study have strong similarities to those found by Shiller (2000) who reported that fluctuations of equity market prices are higher than the equity market prices predicted by the changes of economic fundamentals. The findings of these studies (Cutler et al., 1991; Shiller, 2000) reveal that equity market prices are influenced by much more than fundamental factors. This leaves a room for the role of investor sentiment in equity markets.

Shiller (1987) conducted a survey on both institutional and individual investors studying their behavior during the equity market crash of 1987. He showed that majority of the investors interpreted the equity market crash as being caused by the psychology of other investors instead of changes in the fundamental factors such as profitability or changes in interest rates. Also Siegel (1992) found that a decrease or increase of corporate profits and the rate of interest could not explain the increase and the eventual collapse of the equity market prices in the year 1987. He suggested that a change in investor sentiment was the main suspect in triggering the equity market collapse.

Neal and Wheatley (1998) examined the predictive ability of closed-end funds discounts, sales to purchases ratio of odd lots and redemptions of net mutual funds as proxy variables for investor sentiment. The closed-ended funds are defined as mutual funds which offer a fixed amount of

stocks, which then list on securities exchanges. The discount of closed-end fund is the variance between the net asset value of the fund's holdings and the prevailing price of the mutual fund. They found that net fund redemptions forecast size premium. Size premium is the propensity for the yields of small company stocks to be higher than the yields of large company stocks. They also found an affirmative association between discounts on closed-ended funds and small company's projected yields but no association between discounts on closed-ended funds and large company's expected yields. These outcomes are in line with equity market myths that stocks of small companies are principally held by retail investors.

Investor sentiment proxy variables that are founded on financial variables extracted from market data are referred to as indirect sentiment measures. According to Matthias et al. (2010), the key flaw of indirect measures of investor sentiment is the need to have a model that relates the financial variables to investor sentiment. However, they are fairly simple and easy to obtain. On the other hand, direct measures of investor sentiment are built on surveying investors' emotions. In other words, the anticipations of the investors is quantified. The sentiment measures that are classified as direct have glitches associated with imprecise replies, queries that are misinterpreted, non-reply and self-selecting partialities that may sway the outcomes.

Brown and Cliff (2004) studied various proxy measures of investor sentiment. They studied polling surveys, consumer confidence index, discounts on closed-ended funds and advance-decline ratio as measures of investor sentiment. Advance – decline ratio refers to the number of stocks that have traded at a higher price relative to their previous trading price divided by the number of stocks that have traded at a lower price compared to their previous trading price. Investment professionals look at advances and declines to analyse the overall behaviour of the equity market so as to understand volatility and to establish whether a certain trend will continue

or reverse. Brown and Cliff discovered that the surveys and the consumer confidence index are definitely related to the discounts on close-ended funds and the advance – decline ratio. They also reported that past market performance is a determining factor of investor sentiment. Further, they established investor sentiment levels and variations in sentiment are certainly associated with market performance but the changes and levels of sentiment have little explanatory power for near-term future stock market returns.

Qiu and Welch (2006) studied investor sentiment proxies anchored on consumer confidence surveys with the measures extracted from the closed-end fund discounts. Their evidence suggests that the consumer confidence surveys and the closed-end fund discounts do not correlate well with one another. Additionally, they stated that measures based on consumer confidence surveys robustly explain the spread between the returns of small and large firms and the spread between the returns of shares held by retail and institutional investors. In summation, their results is consistent with the view that investor sentiment is an important determinant of stock market performance, but that the closed-end fund discount may be an incorrect proxy for investor sentiment.

Other indirect measures using statistical series from futures trading activities is also found in the literature. Simon and Wiggins (2001) investigated sentiment in the equity markets using put-call ratio. They found that put-call ratios are statistically and economically useful contrarian indicators in the S & P 500 futures market. Call option is a derivative instrument that offers an investor the right and not the duty to buy an underlying security at a specified price. Put option is also a type of derivative instrument that gives the investor the right and not the duty to sell an underlying security at a specified price. Therefore, put-call ratio is given by the traded put options divided by the traded call options. If the put-call ratio increases, it means that investors

are investing their money into put options compared to the call options. An increased investment into traded put options signifies that investors are speculating that the stock market will decrease in value and/or they are hedging their investments in case of a sell-off.

Schmitz, Glaser and Weber (2007) reported warrant trades as a useful measure of investor sentiment. Warrant trade is a derivative instrument that provides the investor the right to buy shares from the provider at a price within a specific time frame. Warrants and call options are differentiated by the fact that warrants are provided and guaranteed by a certain company, while call options are instruments listed at the exchange and not underwritten by a certain company. Lee and Song (2003) quantified the sentiment of investors who trade on noise and hype using put-call ratio and the equity market fluctuation index. Their conclusions gave intuitions into the relationship between volume of shares traded and fluctuations of the market index by determining the varying sentiments of various investors.

Baker and Wurgler (2006) studied some measures of investor sentiment extracted from various academic literature: namely; trading volume as measured by number of shares traded; premium on dividend paying stocks; discounts on closed - ended funds, the amount of IPOs and their first day returns and the share of new equity offers. They defined premium on dividends as the variance between the average market to book value ratios of firms paying dividends and firms not paying dividends. They discovered empirical proof that exhibited volume of shares traded, number of IPOs and their first day returns and the share in new equity issues positively associate with investor sentiment surveys whereas the discounts on closed-ended funds and the premium on dividends are found to have a negative association with investor sentiment surveys.

Other studies using equity market transaction data also exist. Saar and Titman (2008) studied individual investors' trading behavior using distinctive data from the New York Stock Exchange that contained the aggregated volume of executed buy and sell orders of individuals over four years. They found that the trades of investors in the equity market can be used to forecast future equity market performance and showed that statistically significant positive payoffs can be realized when the subtle information contained in trade order flows is utilized. A disadvantage of the studies based on market data is disentanglement problem. Disentanglement is the separation of passive investor transactions from active investor transactions. Passive investors make investments with the purpose of long term capital appreciation and restricted maintenance. As a consequence, they do not influence the liquidity of the equity market on a regular basis. This study resolved the problem by accessing the audited file that differentiates active investor transactions from passive investor transactions and stated that it is only active traders that cause liquidity in equity markets. It is noted that disentanglement is also a problem in this study since there is no available data at the NSE that separates passive investor transactions from the active investor transactions. However, it is not likely to be a major disruptive factor as we are focused on the cumulative effects of sentiment on the aggregate NSE equity market.

Studies based on equity market transactions include Jackson (2003) who studied exceptional data set of distinct investors' trades in Australia and determined whether the investment activities of traders cumulate in a methodical fashion. He established that accumulation postulation holds across fifty six unconnected stock brokerage firms and through periods and across sets of listed equities. Moreover, the study reported that separate investor trades display negative response transaction at a weekly occurrence with considerable tenacity. It also reported that trade values net of brokerage commission positively and meaningfully predict future short-term stock market

returns. The results in this study sturdily support the usefulness of studies on investor sentiment based on financial variables extracted from the trade order-flows.

Some experiential works have also aimed at studying the influence of direct proxy measures of investor sentiment on stock market performance. Clarke and Statman (1998) discovered that the sentiment indicator published by Investors Intelligence is unusable as an indicator of future stock price variations. Brown and Cliff (2005) reported empirical evidence that supports investor sentiment affects stock valuations. The researchers show that extreme optimism front-runs period of market over-valuation and high contemporary investor sentiment is precipitated by little incremental long-run yields.

Studies concentrating on indexes of consumer confidence determined the effect of investor sentiment on the stock market. Otoo (1999) reported a positive and strong association between variations in consumer confidence index and stock market performance. Investigating the causative connection between the fluctuations in consumer confidence index and stock market performance, she specified that returns Granger-cause consumer confidence index at very short distances but the converse does not hold. Fisher and Statman (2003) reported positive relationships between variations in consumer confidence index and the returns of low capitalized stocks. Charoenrook (2006) studied whether investor sentiment, as measured by annual variations in the Michigan University Consumer Sentiment Index impact stock market returns. The researcher reported that fluctuations in the consumer sentiment index reliably forecasted stock market returns that are excess of normal returns. Lemmon and Portniaguina (2006) also reported that traders usually overestimate the prices of shares of small companies relative to prices of shares of large companies during periods when consumer optimism is high and the converse holds. Additionally, Schmeling (2009) studied whether the confidence of consumers

affect projected stock returns in eighteen developed countries. He found that investor sentiment negatively predicts the returns of stock markets on aggregate across the developed countries.

Many studies have aimed at examining different determinants of equity market performance in emerging economies. Yartey (2008) studied the fundamental determinants of equity market development using a panel data of forty two developing economies for the period between 1990 and 2004. He found that macroeconomic factors such as income level, gross domestic investment, banking sector development, private capital flows, and equity market liquidity are important drivers of equity market development in emerging countries. The conclusions of the study also demonstrate that political risk, law and order, and bureaucratic quality are important determinants of equity market development. Garcia and Liu (1999) also studied the macroeconomic determining factors of stock market development using combination of cross-sectional and time series data for the period between 1980 and 1995 from fifteen industrialized and developing countries. Their study found that financial intermediary development, saving rate, real income and stock market liquidity are the key drivers of stock market capitalization.

Aduda et al. (2012) studied the determining factors of development in the Nairobi Securities Exchange using annual secondary data for the period between 2005 and 2009. The empirical findings show that domestic savings, income per capita, institutional quality and bank development are critical factors that influence the development of the Nairobi Securities Exchange. The study did not report significant relationships between inflation and private capital flows against stock market development. The result also showed that bureaucratic quality, law and order, corruption index and democratic accountability are also critical factors that influence stock market development.

Ogunmuyiwa (2010) investigated the relationship between investor sentiment and equity market performance in Nigeria for the period between 1984 and 2005. The result of this study portends that market turnover ratio and volume of trading as measures of investor sentiment drives the performance of markets for quoted equities. The empirical evidence of this study also portends that volume of trading and turnover are critical ratios for stock market growth and development. This finding supports the findings of many other studies on stock market development.

Zafar (2013) examined the determinants of equity market performance in Pakistan for the period between 1988 and 2008. He identified the key determinants of equity market performance as foreign direct investment as percentage of GDP, real interest rate and value of traded shares as measure of stock market liquidity. He found that foreign direct investment and value of traded shares have positive impact on equity market performance while real interest rate has negative relationship with equity market performance. In line with our study, Zafar (2013) used market capitalization to measure equity market performance.

2.4 Overview of Literature Review

Extensive works have been undertaken to determine whether investor sentiment matters in equity markets. Many studies have examined the effect of investor sentiment on equity market performance using both direct and indirect measures of sentiment. However, it is noted that there is no consensus on the best way to measure investor sentiment and the extent of its influence on the prices of quoted equities is not yet quantified in emerging markets. Majority of the works on investor sentiment and equity markets relied on case studies and data from equity markets in the developed countries leaving a huge knowledge gap in the emerging countries. This is the motivating factor towards this research study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter of the study illustrates the tools of analysis and describes the data together with methods of analysis that was deployed. The methods and the procedure of the study have been motivated by the reviewed literature both theoretical and empirical in the previous chapter and the type of data available.

3.2 Theoretical framework

The academic basis of this study is based on Calderon-Rossell (1991) behavioral model of stock market performance. In this model, economic progress and liquidness of the stock market are considered the important determinants of stock market performance. In the model, market capitalization is defined as follows:

$$MC = NV \dots\dots\dots(1)$$

Where:

MC = Market capitalization

N = Number of quoted companies in the equity market

V = Average value of quoted companies

The model is presented as below:

$$MC = NV = MC (G, T) \dots\dots\dots(2)$$

$$V = V (G, N), N = N (T, V) \dots\dots\dots (3)$$

G = Gross National Product and T = stock market turnover

The operational equation is then expressed in the following form:

$$\text{LogMC} = \beta_1 \text{LogG} + \beta_2 \text{LogT} \dots\dots\dots (4)$$

The abridged form of the model is framed as follows:

$$\text{LogV} = \alpha_1 \text{LogG} + \alpha_2 \text{LogT} \dots\dots\dots (5)$$

$$\text{LogN} = \varpi_1 \text{LogG} + \varpi_2 \text{LogT} \dots\dots\dots (6)$$

The operational equation 4 is rewritten as:

$$\text{LogMC} = \text{Log (NV)} = \alpha_1 \log G + \alpha_2 \log T + \varpi_1 \log G + \varpi_2 \log T \dots\dots\dots (7)$$

On factorizing, we get:

$$\text{LogMC} = (\alpha_1 + \varpi_1) \log G + (\alpha_2 + \varpi_2) \log T \dots\dots\dots (8)$$

Where:

$$\beta_1 = \alpha_1 + \varpi_1 \dots\dots\dots (9)$$

and

$$\beta_2 = \alpha_2 + \varpi_2 \dots\dots\dots (10)$$

Equation 8 discloses the influence of economic growth and stock market liquidity on stock market performance. The model demonstrates that stock market growth is the effect of the joint outcome of economic growth and stock market liquidity.

3.3 The Estimation Model

To meet our research objectives, we changed the Calderon-Rossell (1991) model to include more financial and economic variables that elucidate the performance of quoted equities in Kenya more robustly. In particular, we examined the role of investor sentiment, economic growth and NSE 20-share index growth on the performance of quoted equities at the NSE. Hence, we estimated the following regression model:

$$\text{LogMC}_t = \beta_0 + \beta_1 \text{logSENTIMENT}_t + \beta_2 \text{logGDP}_t + \beta_3 \text{logNSEI}_t + \varepsilon \dots\dots\dots(11)$$

Where:

MC_t = Market Capitalization of the NSE equity market

SENTIMENT_t = Investor Sentiment in the NSE equity market

GDP_t = Gross Domestic Product of Kenya

NSEI_t = NSE 20-share Index

ε = the Error Term

3.4 Definition of the Variables

a) Stock Market Performance

The dependent variable of this study is the NSE equity market performance. We used market capitalization to quantify NSE equity market performance. Stock market capitalization equals the total value of all the issued shares of the publically traded companies. It is assumed that market capitalization as a representative of general stock market scope is meaningfully and positively associated with the capacity to rally wealth and spread risk on an economy-wide basis.

b) Investor Sentiment

Investor sentiment is the explanatory variable of interest in this study. We quantify investor sentiment by two indicators which are commonly used by both theoretical and empirical studies to proxy investor sentiment. The first indicator is the turnover which is the total value of traded shares during a given time period. The second indicator is the volume of shares traded defined as the total number of shares traded during a given time period. Turnover and volume of shares traded are analogous and interrelated in the sense that they both represent the level of interest and amount of liquidity in the stock market. Liquidity measures the rate at which agents can convert quoted equities into purchasing power (Bencivenga et al., 1996; Levine, 1991; Levine and Zervos, 1998).

c) National Income

National income has been found to be significantly and positively correlated with the size of the equity market (Levine and Zervos, 1998; Matu, 2007; Mackinnon, 1973; Mukulu, 2012; Shaw, 1973). We used the GDP growth rate of Kenya to control for the effect of national income on NSE equity market performance.

d) Stock Market Index

This is the measure of the weighted-averages of the changes in prices of listed shares at certain points in time. The purpose is to provide a general parameter of the performance of the 'blue-chip' companies quoted at the NSE. The NSE 20-share Index is used to control for the effect of the growth of the blue chip companies on the performance of the quoted equities at the NSE.

3.5 Estimation Procedure

Multiple regression analysis was used to assess the significance of the parameter estimates. The study used STATA statistical program to establish whether a statistically significant relationship exists between the measures of investor sentiment and the performance of the NSE equity market, while controlling for other factors.

Time series data analyzed through regression tacitly assumes that the mean, variance and covariance of the time series data are time-invariant (Gujarati and Porter, 2009). However, in practice the mean, variance and covariance of time series variables are mostly time-variant (non-stationary). Therefore, stationarity was tested for the data series by determining whether it contained a unit root. The augmented-Dickey Fuller (ADF) test was used for this determination.

Regressions of a certain time series variable against other time series variable(s) normally give spurious results. To watch against this occurrence, the study tested if the measured variables were co-integrating. Co-integration means that despite being separately non-stationary, a linearly combined time series variables can be stationary. The augmented Engle-Granger (AEG) test was used to discover if the time series variables were co-integrated.

Co-integration of time series variables suggests that there is an equilibrium relationship between the variables. The Error Correction Model (ECM) was applied as a means to resolve the short run behavior of the variables with their long run behavior.

3.6 Data Type and Source

The study used secondary quarterly time series data for the period between 1996 and 2013. The data analyzed was obtained from the Nairobi Securities Exchange and the published Kenya economic surveys.

CHAPTER FOUR

EMPIRICAL ESTIMATION RESULTS

4.1 Introduction

This chapter presents results from the empirical estimation and also gives the economic interpretations of the results. It includes a presentation of the descriptive statistics of all the variables in the estimated model, the unit root test results, the co-integration test results, the error-correction model, the post-estimation diagnostics and discussion of the results.

4.2 Descriptive Data Analysis and Statistical Tests

Descriptive data analysis was conducted so as to ascertain the data's statistical properties in order to give the model estimated an appropriate mathematical and functional form. Table 4.1 shows the mean, standard deviation, skewness, kurtosis and Jarque-Bera (JB) statistics of all the variables in the model specified in equation 11.

Table 4.1: Descriptive Data Analysis

Variables	Mean	Std. Dev	Skewness	Kurtosis	JB Statistics
$\ln MC_t$	26.47454	1.016928	0.0494869	1.328511	12.78*
$\ln Voltraded_t$	18.18339	1.73662	0.2109584	1.819699	14.80*
$\ln Valuetraded_t$	21.48465	1.549829	-0.0049538	1.788972	16.11*
$\ln GDP_t$	26.40235	0.1958374	0.278131	1.755543	18.99*
$\ln NSEI_t$	8.019458	0.3986432	-0.8278394	3.230706	7.44**

Note: * and ** means 1% and 5% significance level

Source: Author's own computation with Stata 12

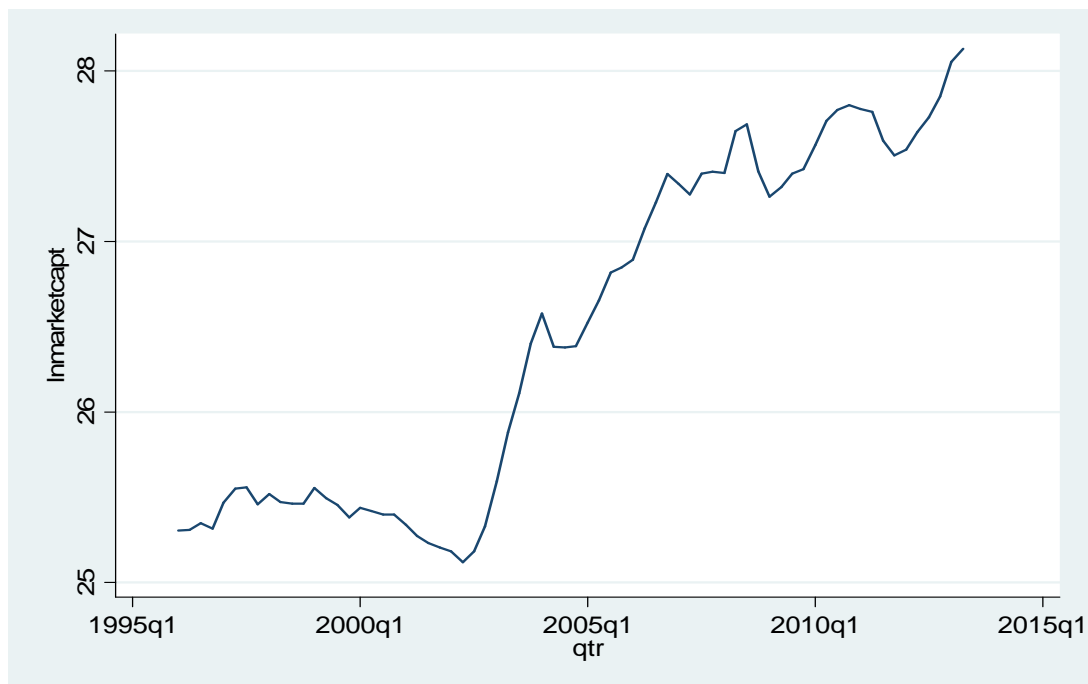
Table 4.1 suggests that, the natural logarithms of all the variables are not dispersed significantly from their mean values as seen from their small standard deviation values. A normally

distributed data should have skewness of zero. Any symmetric data should have skewness of near zero. The skewness of $\ln\text{Valuetraded}$ and $\ln\text{NSEI}$ are negative. This means that the data is skewed to the left implying that the left tail is long relative to the right tail. The other variables have positive skewness which means that the data is skewed to the right which implies that the right tail is long relative to the left tail. The kurtosis of all the variables is positive indicating a peaked distribution. The Jarque-Bera test is a goodness of fit test of whether the sample data have the skewness and kurtosis matching a normal distribution. The JB statistics show that the data is normally distributed because it has a chi-squared distribution with two degrees of freedom and its value is greater than the 0.05 level of significance.

4.2.1 Graphical Data Analysis

A trend analysis of the data was conducted so as to detect the movements in the value of the variables over time and to analyze the possible causes of such movements.

Figure 4.1: Trend of the Natural Logarithm of Market Capitalization

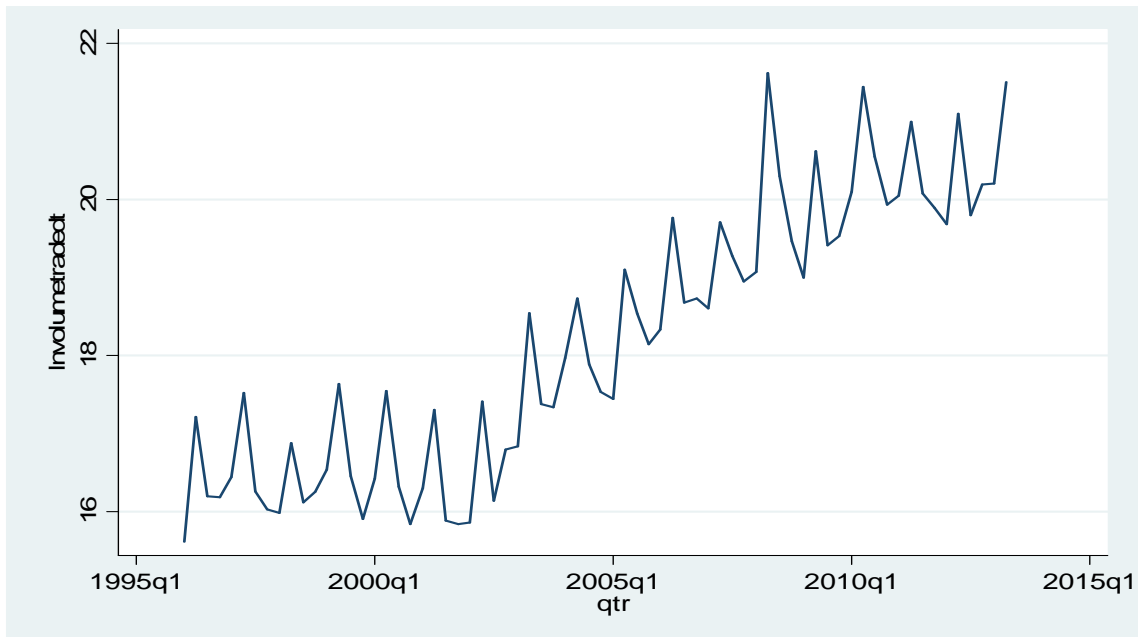


Source: Author's computation

Figure 4.1 shows the movements in market capitalization of the NSE equity market from the first quarter of 1996 to the first two quarters of 2013. Figure 4.1 illustrates that the natural logarithm of market capitalization has been increasing over time. It rose from the second quarter of 2002 to the second quarter of 2013. However, the trend has been oscillating but with an upward trend.

Figure 4.2 illustrates the movement of the natural logarithm of volume of shares traded from the first quarter of 1996 to the first two quarters of 2013. The figure suggests that the natural logarithm of the volume of shares traded has an upward trend movement oscillation.

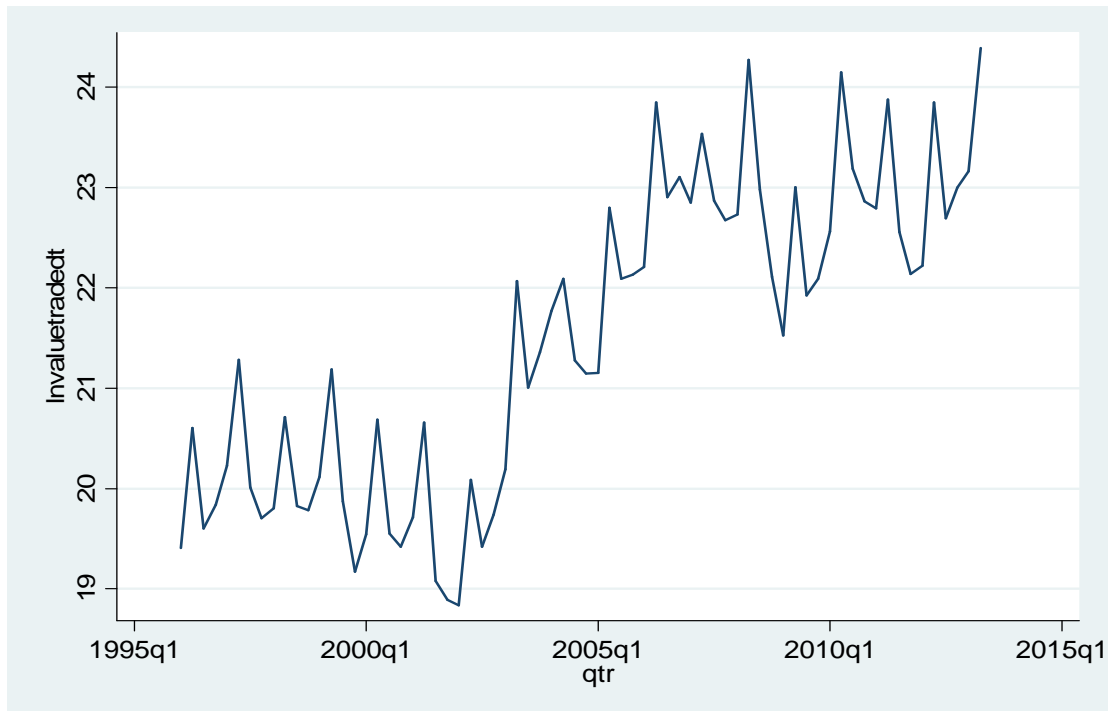
Figure 4.2: Trend in the Natural Logarithm of Volume of Shares Traded



Source: Author's computation

Figure 4.3 shows the trend movement of the natural logarithm of value of shares traded from the first quarter of 1996 to the first two quarters of 2013. It is evident from the figure that the value of shares traded followed an upward trend after its initial trend of oscillating around the 17th number. Similar to volume of shares traded, the value of shares traded also followed an upward trend as indicated in figure 4.3 after oscillating around the 17th number.

Figure 4.3: Trend Movement of the Natural Logarithm of the Value of Shares Traded

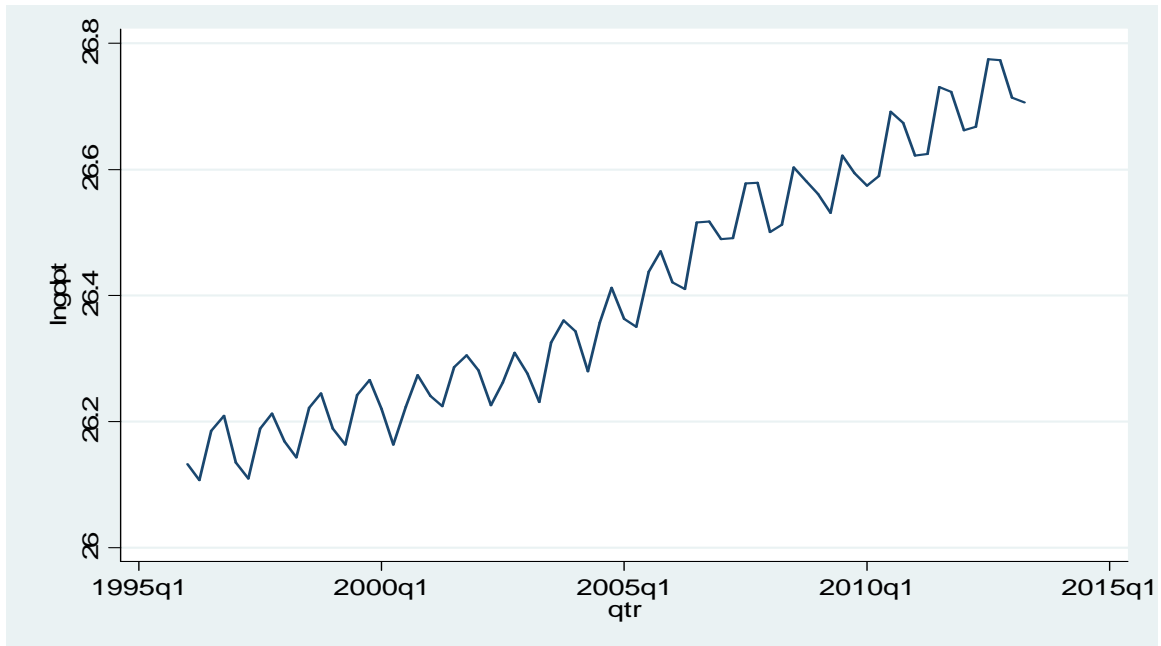


Source: Author's computation

Figure 4.4 shows that the natural logarithm of quarterly GDP has been on an upward trend oscillation for the period between 1996 and 2013. The trend movement of the natural logarithm of GDP appears to follow a smooth path revealing the possibility that the underlying time series data is stationary.

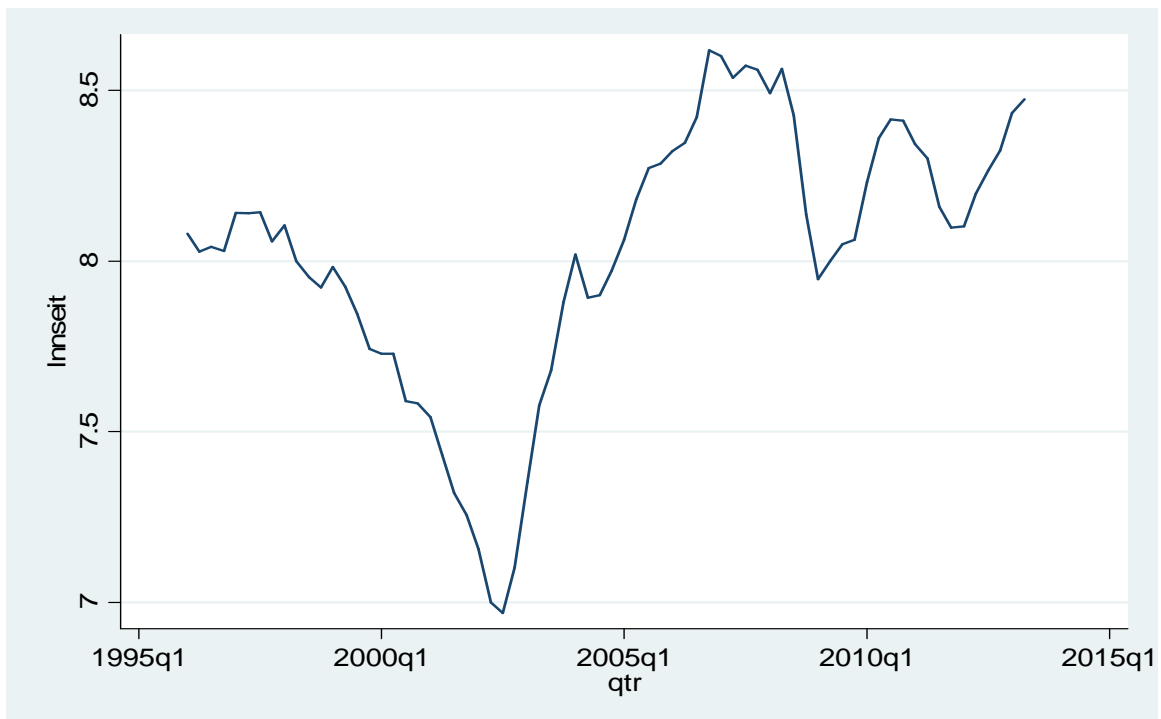
Figure 4.5 shows no particular trend in the movement of the natural logarithm of the NSE 20-share Index variable. The variable first follows a downward trend up to less than 7 points after which it rises to slightly above 8.5 points then starts oscillating around 8.3 points.

Figure 4.4: Trend Movement of the Natural Logarithm of Quarterly GDP



Source: Author's computation

Figure 4.5: The Trend Movement of the Natural Logarithm of the NSE Index



Source: Author's computation

The graphical presentation of the variables revealed an upward trend in most of the variables apart from the natural logarithm of the NSE 20-share Index which has not shown any particular trend. However, trend in the natural logarithm of volume and value of shares traded showed a trend which is not smooth. It implies that these variables are sensitive to shocks. In 2007, Francis Thuo and Partners collapsed and this caught investors by surprise as the market fundamentals were then considered strong. Around this period, volume and value of shares traded shot-up rather quickly and this could have been as a result of the negative sentiments amongst the investors who resorted into panic selling. This explains the possible shoot-up of the turnover and total volume of shares traded at the NSE during this period.

In 2009, the trend movement of the natural logarithm of the volume and value of shares traded declined sharply. This is attributed to the run-away sentiments following the global financial crisis and the after-shocks of 2007/2008 post-election chaos in Kenya. During this period, investors largely kept out of the market as there were no enough buyers to support the market and hence stock prices dipped as reflected in the trend of the natural logarithm of market capitalization in figure 4.1.

4.3 Unit Root Test Results

Despite the graphical presentation showing possibility of stationarity in most of the variables, it was still necessary to carry out stationarity test to prove the status of the underlying time series data. Therefore, before testing for the long run (co-integration) relationship between the variables, Augmented Dickey Fuller (ADF) test was conducted in order to ascertain the order of integration of the variables. This process was meant to ensure that none of the variables was integrated of order 2 i.e. $I(2)$ so as to avoid the problem of spurious results. The unit root test results for all the variables are reported in table 4.2. The results suggest that all the variables are

integrated of order one, I(1) that is, stationary at first difference except for the natural logarithm of *valuetraded* that is, I(0) with a trend.

Table 4.2: ADF Unit Root Test Results

Variables	Levels		First Differences		Lags
	Trend	No Trend	Trend	No Trend	
$\ln MC_t$	-2.130	-0.183	-4.893*	-4.893*	0
$\ln Voltraded_t$	-3.015	-0.224	-11.718*	-11.791*	0
$\ln Valuetraded_t$	-3.445**	-1.060	-11.247*	-11.319*	0
$\ln GDP_t$	-2.048	1.057	-8.656*	-8.724*	0
$\ln NSEI_t$	-2.184	-1.574	-4.495*	-4.493*	0

Note: * and ** means 1% and 5% significance level

Source: Author's own computation with Stata 12

4.4 Co-integration Test Results

Having established that the variables included in the model are integrated of the same order (order one), the next procedure is to test the possibility of co-integration among the variables used. When testing for co-integration Engle and Granger (1987) procedure, which is based on testing for a unit root in the residuals of the estimated long-run relationship by employing the ADF test, was used. If the residuals are stationary then it means that the independent and dependent variables are co-integrating. If the variables under investigation are found co-integrated, there exists a long run or equilibrium relationship between the variables. Therefore, ordinary least squares (OLS) estimation would not be a valid estimation technique since the residuals used in the estimation needs correction. In the presence of co-integration, the theorem of Engle–Granger (1987) can be used to show an error correction model (ECM) to reconcile the

short run and the long run behavior of the variables. Table 4.3 shows the results of the co-integration test.

Table 4.3: Co-integration Test Results

Variable	Trends	Test Statistics	1% Critical Value	5% Critical Value	10% Critical Value	P-Value
Residuals	Trend	-3.263	-4.117	-3.485	-3.171	0.0726
Residuals	No Trend	-3.330	-3.559	-2.918	-2.594	0.0136

Source: Author's own computation with Stata 12

The results presented in Table 4.3 show that the ordinary least square residuals without a trend are stationary at 5% and 10% critical values and the p-value 0.0136 is less than the 0.05 level of significance. Therefore, the variables in the model are co-integrated, indicating that there is a long-run relationship between the measures of stock market liquidity as proxy variables of investor sentiment and the performance of quoted equities in Kenya, represented by market capitalization. This is consistent with prior expectation; we anticipated investor sentiment to be an important determinant of stock market capitalization which the result holds.

4.5 Error-Correction Model (ECM)

Estimating a model with non-stationary variables could lead to spurious regression. To solve for non-stationarity, the variables are first differenced and then the short-run relationship is estimated. But estimating a model with first differenced variables leads to a loss of long-run information. Therefore, an error-correction model is used to bridge both the long-run and short-run relationships within the context of a single equation. Table 4.4 presents the error correction models estimations.

Table 4.4: Error-Correction Model Estimates

Variables	Coefficient	Std. Error	t-Statistic	P-Value
LDlnMC _t	0.2008883	0.3274469	0.61	0.054
LDlnVoltraded _t	0.1027177	0.0548223	1.87	0.066
LDlnValuetraded _t	0.1155889	0.0578	-2.00	0.050
LDlnGDP _t	0.0533809	0.3235174	-0.17	0.070
LDlnNSEI _t	0.4322473	0.2823286	1.53	0.031
LECM	-0.453873	0.2585926	-0.18	0.035
Constant	0.0302671	0.017993	1.68	0.098
Number of observation = 64 F(6, 57) = 4.19 Prob>F = 0.0015 R-squared = 0.8234 Adj R-squared = 0.8092 Root MSE = 0.0495				

Source: Author's computation with Stata 12

Table 4.4 shows that the one period lag of market capitalization has a positive statistically significant impact on market capitalization at the 10% level. The volume of shares traded on its part has a positive and significant effect on market capitalization at the 10% level. Similarly, the value of shares traded variable exerts a positive and significant effect on market capitalization at the 5% level. Gross Domestic Product also exerts a positive and statistically significant effect on market capitalization at the 10% level. The NSE 20-share Index variable exerts a positive and statistically significant effect on market capitalization at the 5% level.

The error-correction term shows that 45% of the errors are corrected each period and its impact is statistically significant. Additionally, the adjusted R² shows that about 81% of the variations in market capitalization are explained by the model after correcting for degrees of freedom. This is a reasonable result to enable the study conclude that volume and value of shares traded as proxy measures of investor sentiment predict the variations in market capitalization as an indicator of

equity market performance. The F-statistics shows that the estimated parameters are jointly significantly different from zero.

4.6 Post-Estimation Diagnostics

A post-estimation diagnostic was carried out with the aim to determine if the model estimated was properly specified. The Ramsey RESET test with the null hypothesis that the model has no omitted variables was used. Table 4.5 reports the results from the Ramsey RESET Test.

Table 4.5: Ramsey RESET Test Results

F-statistics	Probability Value
0.16	0.9213

Source: Author's Computations

Table 4.5 suggests that the model has no omitted variables and thus well specified as indicated by the p-value 0.9213 which is greater than the 1%, 5% and 10% levels of significance.

A test for autocorrelation was conducted using the Breusch-Godfrey Serial correlation LM test which is based on the null hypothesis of no serial correlation against the alternative of serial correlation. Table 4.6 reports the results from the test.

Table 4.6: Breusch-Godfrey Serial Correlation LM Test Results

F-statistic	Probability Value
1.019	0.3128

Source: Author's Computations

Table 4.6 shows that the residuals of the model are not serially correlated with the variables as indicated by the p-value 0.3128 which is greater than the 5% level of significance. The test for heteroskedasticity of the residuals was also conducted using the Breusch-Pagan-Godfrey test which is based on the null hypothesis of constant variance. Table 4.7 reports the results.

Table 4.7: Breusch-Pagan-Godfrey Test for Heteroscedasticity Results

F-statistic	Probability Value
1.35	0.2454

Source: Author's Computation

Table 4.7 shows that the residuals of the model have no heteroscedasticity as indicated by the p-value 0.2454 which is greater than the 5% level of significance.

4.7 Discussion of the Estimated Results

The study sought to answer the question: what role does investor sentiment play in the performance of quoted equities in Kenya. The co-integration test revealed that the variables are co-integrated implying that there is a long run relationship between the proxy measures of investor sentiment (volume and value of shares traded) and performance of quoted equities in Kenya.

The error-correction model estimates show that the volume of shares traded and value of shares traded have a positive and significant impact on market capitalization. This means that, a one percent increase in the volume of shares traded will lead to a 10.27% increase in market capitalization. Similarly, a one percent increase in the value of shares traded will lead to an 11.56% increase in market capitalization. Liquid stock markets are said to enable investors to modify their portfolios quickly and cheaply. It facilitates investment projects and makes them less risky (Bencivenga et al., 1996; Levine, 1991; Levine and Zervos, 1998). Therefore, the empirical results are consistent with the priori expectation that volume and value of shares traded have a positive impact on stock market capitalization since larger amount of savings are channeled through the stock markets when they are liquid.

The Gross Domestic Product of Kenya has a positive and significant impact on the capitalization of the NSE equity market. This implies that a one percent increase in GDP would result to an increase of 5.34% in market capitalization. As national income increases, its cyclical component should have a positive incidence on the size of the stock market. In addition, higher income means better education, better business environment and wealthy citizens. We therefore expected economic growth to have a positive impact on stock market capitalization which the result holds.

The NSE 20-share Index has also a positive and significant impact on the market capitalization. This means that a one percent increases in NSE 20-share index will lead to a 43.22% increase in the market capitalization. This could be explained by the fact that the listed companies that compose the basket of the NSE 20-share index form the bulk of the NSE equity market capitalization.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary of the study, conclusion, policy recommendations, limitations of the study and areas for further research.

5.2 Summary of the Study

The research study examined the relationship between investor sentiment and equity market performance using quarterly data for the period between 1996 and 2013. Two proxy variables used to measure investor sentiment included the volume of shares traded and value of shares traded. Market capitalization was used as an indicator of equity market performance.

The study used pre-estimation tests such as statistical, descriptive, graphical analyses and also examined time series properties of the underlying data using the Augmented Dickey Fuller test to check whether the data contained a unit root. The Augmented Dickey Fuller test showed that all the variables are integrated of order one, that is, stationary at first difference except for the natural logarithm of value of shares traded, that is with a trend.

The test for co-integration showed that the variables in the model are co-integrated, indicating that there is a long-run relationship between the measures of investor sentiment and the performance of quoted equities in Kenya. The model was estimated using error-correction model and the results show that the one period lag of market capitalization, volume of shares traded, value of shares traded, GDP and the NSE 20-share Index variables exert a positive and statistically significant effect on market capitalization. The post-estimation diagnostic tests suggested that the model was well specified as confirmed by the Ramsey RESET test; the

residuals of the model were not serially correlated as determined by the Breusch-Godfrey Serial correlation LM test; and the residuals of the model have indicated no heteroskedasticity as reported by Breusch-Pagan-Godfrey test.

5.3 Conclusions

Many Kenyans believe that their financial freedom will be achieved through the NSE equity market. Many people see the equity market to be the shortest route to fortune in Kenya. However, the poor management of the capital markets in Kenya and the exclusive ownership of the NSE caused apprehension among the investors at the NSE.

Given these challenges, the study sought to carry out an empirical examination to establish the relationship between investor sentiment and performance of the NSE equity market. The empirical results of the research study show that there is a positive and significant relationship between investor sentiment and performance of quoted equities in Kenya. Put in another way, the bullishness or bearishness of market participants that is not founded on economic fundamentals has been found to have a positive and significant relationship with the performance of NSE equity market.

The relationship between market capitalization and the measures of investor sentiment are positive both in the long run and short run. The study found that the two proxy variables for investor sentiment which include the volume of shares traded and value of shares traded have a positive and significant relationship with market capitalization. Similarly, national income and the NSE 20-share index have a positive and significant relationship with market capitalization which is used as an indicator of equity market performance.

5.4 Policy Recommendations

Investor sentiment has been found to play statistically significant role in the performance of quoted equities in Kenya. Hence, the important policy question that arises is: what can policy makers do to promote investor confidence. Investor confidence is influenced by various factors including tax, regulatory, accounting and corporate governance issues and as a result it may be beyond the scope of any solitary study to afford all the answers to this policy question. However, the certainty and ease with which investors can transact on their stocks is determined by the efficacy of trading. Thus, policy actions should target measures that foster stock market liquidity, market capitalization and the general efficacy of the stock market. Therefore, the recommendations wished-for in this study are destined to serve as guidelines to policy formulation and investment decision making that ultimately improves the capitalization of the stock market.

It is pertinent for the government of Kenya and the capital market stakeholders to strengthen institutions of corporate governance for the market intermediaries. Adoption of best international practices in terms of measures for the effectiveness of the corporate Board of Directors and increased shareholder rights is paramount. Demutualization of the NSE should be accelerated as an instrument for improved governance originating from separation and ownership of the exchange and promoting investor confidence in the system. A well-functioning stock brokerage regulatory scheme with strong supervisory and monitoring role for regulators should be established. Public confidence should be fostered and informational efficiency improved with appropriate disclosure rules, accounting standards and contracts enforceability that is consistent with international best practices.

There is need for policy makers to strategize on how best to improve the capacity of human capital to manage risk for brokerage firms. This will lead to enhancement of risk control mechanisms as markets become more sophisticated and the possibility of venturing into the derivative markets increases. Adoption of risk based supervision mechanisms for stock market intermediaries modeled like the banking sector will foster risk mitigation. Establishment of a comprehensive capital market database is recommended to foster both practitioner investment research and academic research - making it possible for the stock market to be subject to best research practices based on fundamental analysis.

The NSE and other relevant stakeholders need to increase the number of listed companies to improve market capitalization. Incentives and programmes to encourage more listings on the securities exchange should be provided. Active policy of looking for new companies that qualify for listing throughout the country whether large or small should be adopted. Provision of incentives for listing on the securities exchange as a means to achieve greater market depth and trading activity is recommended. These should include tax and fiscal incentives. International road shows should be arranged by the market players to boost awareness of these incentives.

Stakeholders should develop over-the-counter market as an alternative trading platform to cater for the majority of companies that may wish to list but are hampered by the stringent exchange requirements. This could serve as an incubator market to the main securities exchange. The development of mechanisms to encourage companies to engage in dual listings is also important as it will increase the size of the market. Memorandum of understanding with regional securities exchanges should be pursued to encourage cross-listings.

The initiative to introduce derivative market should be fast-tracked to increase the investment choices available to investors. The development and operationalization of the Kenya Agricultural Commodities Exchange could be the starting point. The Johannesburg Securities Exchange has operated a single stock futures market since 2001 which is now one of the largest such market in the world.

Policy makers should come up with policies that will ensure improved efficiency, lower transaction costs and increase liquidity in the market. This is because there is positive and significant relationship between value of shares traded and stock market performance. The same policy will improve volume of trading which has also a positive and significant relationship with stock market performance. This will make the NSE equity market more vibrant and increase its capitalization. A policy action that can be immediately adopted is the reduction of the current settlement cycle of T+3, transaction date plus three working days, which lengthens the financial transaction period. Such a long period of trading cycle wastes investors' time and adversely affects the liquidity and efficiency of the market.

To increase liquidity in the market, alternative trading mechanisms in the equities market especially on-line trading; margin trading and short selling could be established. However, these mechanisms can only be successful if the equity market infrastructure and microstructure is fully automated including the back-office operations of the stock-brokerage companies. Complete automation of the market microstructure reduces the costs and inefficiencies associated with manual systems. It increases trading activity and liquidity in the stock market by speeding up operations.

It is important to consider policies to increase the amount of shares available for sale in the securities exchange without actually affecting the demand for the same shares. This can be achieved either through cross-listing, dual listing or integration of securities exchanges. Active engagement in programs aimed at achieving greater public confidence is paramount. Among the main measures that could assist in confidence-building include adoption of best trading practices, increasing media understanding and reporting on business matters, increasing the enforcement mandate of the CMA, committing to public education as a primary goal of the regulatory agencies and expanding the capacity for institutional investing by pension and retirement funds since the retail investors savings pool is traditionally low in Kenya.

It is also important to consider reducing restrictions on private capital inflows or removing barriers to repatriating dividends or capital. This will enhance the integration of emerging markets into the global financial markets, hence aligning the prices of domestic securities with those of other countries; it forces domestic firms seeking foreign capital to improve their information disclosure policies and accounting systems. Equally, the increased participation of foreign investors into markets in the developing countries may lead to enhancement of trading systems and the operating legal systems that is conducive to trading.

In this study, the economy also drives the growth of the stock market. Economic growth plays a significant role in the performance of the NSE equity market. Therefore, policy makers in Kenya may initiate policies that foster economic growth. In sum, the study emphasizes on the adoption of policies that will boost the confidence of market participants and recommends enforcement of stricter and flexible regulatory regime by the Capital Markets Authority to improve market efficiency.

5.5 Limitations of the Study

The study used quarterly secondary time series data which was marked with unique set of problems in terms of collection, processing procedures and analysis. There were cases of missing values especially with the quarterly GDP figures. Approximate values were used in such instances and this may have compromised the accuracy and quality of the data.

The study used financial variables as proxy measures of investor sentiment. Despite relying on a theory to relate the financial variables to investor sentiment, the correct sentiments of market participants over the period under study may not have been well captured. Moreover, sentiment is said to be an animal spirit and therefore there is no consensus in the literature on how best to measure it. This challenge was also compounded by the fact that there are no direct surveys or index to measure investor sentiment in Kenya.

5.6 Areas for Further Research

Since investor sentiment was found to be such an important determinant of stock market performance, further research should be undertaken towards the exact mechanism by which it influences performance of quoted equities. In this regard, further studies should include other measures of investor sentiment used in the literature such as direct polling of investors, advance-decline ratios and warrant trades among other indicators.

There is also need for a further research on the determinants of investor sentiment in Kenya and how it may relate to the stock prices of the specific companies quoted at the NSE. A panel data analysis needs to be carried out in this area in future.

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