THE EFFECTS OF HERDING ON STOCK RETURNS AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

This research project is my original work and has not been presented for any academic award in any other institution.

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DEDICATION

To my parents Celestine Nyarotso Indeche and Michael Matika Siloya.

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LIST OF ABBREVIATIONS

APT   Arbitrage Pricing Theory

BF   Behavioral Finance

CSAD   Cross Sectional Absolute Deviation

CSSD   Cross sectional standard Deviation

CAPM   Capital Asset Pricing Model

CMA   Capital Markets Authority

EMH   Efficient Market Hypothesis

KENGEN   Kenya Electricity Generating Company

MPT   Modern Portfolio Theory

NSE   Nairobi Securities Exchange

STDEV   Standard Deviation

ABSTRACT

Human beings are social beings who thrive from the sense of belonging and togetherness. This innate need results to herding, an attempt by people to blend in by mimicking actions of others. Herding in capital markets is in general exhibited by propensity of an investor to mimic the actions of large group of investors, those regarded as better informed and at the same time neglecting personal information and expectations. The objective of the study was to investigate the effect of herding on returns of stocks traded at the Nairobi Securities exchange; the research design adopted for the study was descriptive research design. Secondary daily price data was obtained from the Nairobi Securities Exchange historical database. Using daily price data, descriptive and regression analysis of returns were computed to test for the presence of herding as suggested by Chang, Cheng, and Khorana (2000). In the presence of herding the γ_2 coefficient was expected to be significantly negative. The regression coefficient γ_2 was found to be positive for the sub periods: 2001 to 2007, 2008 to 2010, 2011to 2014 and the market as a whole these results indicate there is no evidence of herding and its effects on stock returns at the in the Nairobi Securities Exchange.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Economists and finance scholars have trusted in the Efficient Market Hypothesis for a long time and have just recently admitted to investors having irrational aspects in their investment decision-making behavior. This was after the award of the 2002 Nobel Memorial Prize in Economic Sciences was awarded to Daniel Hahnemann for his empirical findings challenging the assumption of human rationality prevailing in modern economic theory.

Behavioral Finance is the application of psychology to financial behavior. Investors respond to natural psychological factors such as fear, hope, optimism and pessimism when making their investment decisions like in all other decisions they make. As a result, asset values may deviate from their fundamental value and as such, the theory of market efficiency suffers (Mayo, 2009).

Herding refers to action or activity without prior rational thinking because of influence from others (Banerjee, 1992). There has been interest in the area of herd behavior stemming from the effects that herding may have on financial markets stability and ability to achieve allocative and informational efficiency both from critics and proponents of the theory.

1.1.1 Herding

Herding occurs when investment behavior tend to converge to the average even when market information analysis is to the contrary (Hirshleifer & Teoh, 2003).

Investors and economic agents imitate each other's actions and base their decisions upon the actions of others. Market participants trade in the same direction during the same time forming a correlated behavior.

Explanations as to why investors herd may include: the fact that market participants may gather information from the actions of previous participants, investors may react to the arrival of fundamental information in a similar manner, investors may simply be irrational and herd behavior can arise because of psychological and social conventions (Spyrou, 2013).

Several elements that impact herding by investors includes: overconfidence, volume of investment, knowledge of the investment environment and so on. The more confident the investors are, the more they rely on their private information for the investment decisions. In this case, investors seem to be less interested in herding. When the investors put a large amount of capital into their investment, they tend to follow the others' actions to reduce the risks. The preference of herding also depends on types of investors, individual investors have tendency to follow the crowds in making investment decision more than institutional investors (Good fellow, Bohl & Gebka, 2009).

The obvious outcome of herding is inefficient markets. Market participants' trade in similar manner regardless of factual analysis and informed predictions. Prices are destabilized leading to bubble-like episodes in financial markets (Ombai, 2010). Accumulations of unproductive counters by market participant against expert analysis, skewed market return are some of the indications of herded counters.

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Waweru, Munyoki, and Uliana (2008) propose that herding can drive stock trading and create the momentum for stock trading. Olsen (1996) analyzed the implications of herding on earnings forecasts proposing that herding results in a reduction in dispersion and an increase in the mean of the distribution of expert forecasts creating a positive bias in earnings estimates.

1.1.2 Stock Returns

Davis (2001) defined stock returns as the gain or loss of a security in a particular period consisting of income in the form of dividends and the capital gains relative on an investment, usually quoted as a percentage. The theory of stock price behavior starts with Markowitz in 1952 and 1959. The Markowitz model is a single-period model, where an investor forms a portfolio at the beginning of the period. The investor's objective is to maximize the portfolio's expected return, subject to an acceptable level of risk or minimize risk subject to an acceptable expected return. The assumption of a single time period, coupled with assumptions about the investor's attitude toward risk allows risk to be measured by the variance or standard deviation of the portfolio's return.

While building on the Markowitz framework, Sharpe in (1964), Lintner (1965) and Mossin (1966) independently, developed what has come to be known as the Capital Asset Pricing Model (CAPM). This model assumes that investors use the logic of Markowitz in forming portfolios. It further assumes that there is a risk-free asset a government security that has a certain return.

Stock return is a gain or loss of a security in a particular period (www.invesopedia.com). The return consists of the income and the capital gains relative on an investment. It is usually quoted as a percentage. Stock market returns are not homogeneous and may change from investor-to-investor depending on the amount of risk one is prepared to take and the quality stock market analysis. Stock market returns are subject to risk.

1.1.3 Herding and Stock Returns

When investors converge to the same stock, the resultant effect is over or under pricing of stocks, general over and under trading in the securities markets and lower or higher bond yields (Nofsinger & Sias, 1999). If securities are underpriced, arbitrage pricing theory stipulates supply and demand factors equalize at equilibrium as the stocks adjust to correct pricing. In the case of herding market, supply outnumbers the demand when the stock open for trading hence prices will plummet. This causes the capital gains and dividend returns to fall sharply. While there are numerous examples of this type of behavior within the equity market, the historical buy and hold mentality of bond investors has traditionally insulated the fixed income market from this type of reaction.

Hirshleifer, Subramanian and Titman (1994) observe that when herding, investors focus only on a subset of securities while neglecting other securities with identical exogenous characteristics, this leads to overall stock market inefficiencies thus stock returns not based on fundamentals. Herding results in stock price volatility and consequently returns volatility. Hong, Kubik, and Stein (2005) find that mutual fund managers herd in terms of the stocks that they buy or sell during a particular quarter.

Garvey and Murphy (2004) find evidence of the disposition effect the tendency to sell winners and hold losers. This tendency to sell winners and hold losers lowers the returns the traders earn.

1.1.4 Nairobi Securities Exchange

The Nairobi Securities Exchange turning 61 this year as a bourse, having opened in 1954. It is located in Westlands. Formerly referred to as the Nairobi Stock Exchange the NSE currently hosts: 61 equities, 57 government bonds, and 28 commercial ones. It is a demutualized exchange in line with best practices separating membership, direction, and management of the exchange. It made an Initial Public offer of its shares in 2014(NSE website, 2015)

The main indices in the NSE are: the NSE 20 share index, Nairobi all shares index (NASI) and AIG (American International Group) 27-share index (NSE website 2015). The NSE 20 share index is equal-weighed geometric mean of 20 large ordinary stocks traded on the Nairobi Stock Exchange. The Local investors hold share totaling52.39% of shares trading at the NSE with the balance allocated as follows: Local corporate 25.39%, foreign corporate 20.44%, East African Individuals 0.13% and East African Corporate 0.62% (CMA Bulletin Q 2, 2015).

Stock returns at the NSE have exhibited an upward trend with slump in returns only occurring during extreme market conditions such as, election period and also during the global financial crisis and the collapse of major stock brokerage Firm. On 18 February 1994 the NSE, 20-Share Index recorded an all-record high of 5030 points.

The NSE was rated by the International Finance Corporation (IFC) as the best performing market in the world with a return of 179% in dollar terms during that year (NSE Website, 2015).

1.2 Research Problem

The efficient market hypothesis of Fama (1970) underscored the fact that if markets are efficient in any of their three forms then security prices reflect fully available information. Implying that securities are always correctly priced depending on the available information

If they are not, investors are quick to pick undervalued stocks hence increasing demand thereby demand over stripping supply leading to increase in prices to the equilibrium. The main aim of any investor is the promised return on the stock hence they would always like to maximize the same. The main logical explanation would thus be all undervalued securities are overtraded while overvalued experience lowers trading volumes.

Mokua (2003) States that it is important for investor to understand the securities market imperfections to be able to take advantage of them. Nairobi Securities Exchange has depicted various patterns with respect to herding in stocks and their returns. This implies that herding has a direct link to future prices of the stock and their consequent returns. It is therefore critical to study what effect herding has on future prices and Returns of securities to inform the stability and ability to achieve allocative and informational efficiency of the NSE market.

Several studies have been done at the NSE in relation to Herding. Ombai (2010) set to find out the herd effect at the NSE during the global financial crisis. Behavioral finance provided a fundamental theoretical framework for this study. Carrying out a cross sectional study for the period between 2005 and 2009 on firms listed in the NSE he found out that the general dip in returns of stocks comprising the NSE 20 share index coupled with the decline in returns in the NSE 20 share index itself was a pointer to the existence of herding behavior. Subsequently, regression analysis undertaken indicated that the coefficient y2 was significant and negative in the period after the global financial crisis only, thus giving strong indication that herding behavior was prevalent at the NSE as a psychological response by stock investors to the global financial crisis.

Kimani (2011) set to find out behavioral factors influencing individual investors' choices of securities at the Nairobi Securities Exchange. This study sought to determine the impact levels of behavioral influences such as herding on the individual investor choices of securities at NSE in the equity market. It was guided by one main objective seeking to determine the impact levels of behavioral influences on the individual investor choices of securities at NSE in the equity market. It was based on the 100 individual investors selected from the twenty registered stock brokerage and investment banks. Cronbach Alpha Test was used to test the internal consistency reliability of measurements, which are in formats of continuous variables 6-point Likert measurements. Descriptive analysis was used to analyze the data. The study established that there are five behavioral factors affecting the investment decisions of individual investors at the Nairobi Securities Exchange.

These were listed as Herding, Mental accounting, Overconfidence, gambler's fallacy, and Anchoring. Overconfidence and Gambler's fallacy had higher impact on the decision making of individual investors.

Waweru et al. (2008) surveyed the institutional investors at the Nairobi Stock Exchange. The work investigated the role of behavioral finance and investor psychology in investment decision making. The study established that behavioral factors such as Representativeness, Overconfidence, Anchoring, and Gamblers' Fallacy, Availability, Loss Aversion, Mental Accounting and Regret Aversion affected the decisions of institutional investors operating at the Nairobi Stock Exchange.

1.3 Research Objective

The objective of the study was to investigate the effect of herding on stock returns at the Nairobi Securities Exchange.

1.4 Value of the Study

The study seeks to enrich the existing literature to help investors in their day-to-day investment decisions. This will bridge the gap that exists in the Kenyan securities markets where there is limited financial knowledge, filling the knowledge gap in the field of behavioral finance understanding. It will also open a new field of research and understanding of behavior influences specific to herding on the local primary capital market.

The study is aimed at enlightening policy makers such as the government, Capital Markets Authority, and NSE management on the effects of herding on future returns of securities for policy formulations and implementation. Such information is crucial in policy formulation to protect investors from self-damage, through measures aimed towards mitigating the effects of herding especially in a developing capital market like the NSE where in the extreme herding can lead easily lead to market bubbles and crashes.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Literature review includes comparison between the neoclassical finance theories as well as the behavioral finance theories and other theories that influence these two theories discussed. Conclusion is by looking at empirical studies and their literature review summations.

2.2 Theoretical Framework

To classical economists, that market participants are rational is taken for granted. However, the notion has been criticized in the field of behavioral finance, which studies the effects of social, cognitive, and emotional factors on economic decisions. Theoretical and empirical evidence for long suggested that capital asset pricing model, efficient market hypothesis and other rational financial theories did a respectable job of predicting and explaining certain events. Over time, studies in both finance and economics began finding anomalies and behaviors that could not be explained by these theories. Theories could explain certain idealized events, but real world proved to be a very messy place in which market participants often behaved very unpredictably.

2.2.1 Efficient Market Hypothesis

An efficient market is defined as a market where there are large numbers of rational, profit maximizing participants actively competing, with each other and trying to predict future market values of individual securities. Important current information is almost freely available to all participants.

In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value (Fama, 1965).

The hypothesis connotes that it is impossible to outdo the market because stock market efficiency causes existing share prices to always incorporate and reflect all the relevant information (Fama, Fisher, Jensen and Roll, 1969). Stocks always trade at their fair value on stock exchanges, and thus it is impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. If stock were to be undervalued, all investors would shift counters, creating more demand .The forces of demand and supply will thus regularize the price to equilibrium.

Fama's (1970) work divided market efficiency into three categories, these are: Weak form, Semi- strong form, and Strong form of market efficiency. Fama (1991) noted that in the weak form stock prices reflected only past price information. He later expanded this definition to reflect future price expectations with the use of accounting or macroeconomics variables. The semi- strong form of EMH asserts that securities prices reflect both past and present public information (Fama, 1991). The strong form suggests that securities prices reflect all available, both public and private information.

2.2.2Behavioral finance Theory

Behavioral finance theory is drawn from the knowledge of human cognitive behavioral theories from psychology, sociology, and anthropology applied together with finance and economic principles (Shefrin, 2001). It seeks to understand and predict systematic implications of psychological decision making processes to financial market. Behavioral finance is a branch of finance that studies how the behavior of agents in the financial market and influenced by psychological factors and the resulting influence on decisions made while buying or selling the market thus affecting the prices (Barberis and Thaler, 2003). The science aims to explain the reasons why it is reasonable to believe that markets are inefficient.

Heuristics are simple efficient rules of the thumb, which have been proposed to explain how people make decisions, come to judgments, and solve problems. Typically when facing complex problems or incomplete information. These rules work well under most circumstances, but in certain cases lead to systematic cognitive biases (Daniel Kahneman Parikh, 2011).

Different types of cognitive biases have been documented. Kahneman and Tversky (1974) posit that representativeness; availability, Herd behavior, and overconfidence are among the common forms of heuristics. Ogilo (2012) describes representativeness as a heuristic wherein people assume commonality between objects of similar appearance. One looks at an event and makes judgment as to how closely it corresponds to other events as found in the general population.

Tversky and Kahneman (1974) notes that availability is a cognitive heuristic in which a decision maker relies upon knowledge that is readily available rather than examine other alternatives, facts or procedures.

Human herding results from impulsive mental activity in individuals responding to signals from the behavior of others, individuals mimic the actions of a larger group when individually they would not necessarily make the same choice. When people are confronted with judgment of a larger group they tend to alter their "wrong" solutions and adopt those of the larger group. Shiller (2000) suggested that people by nature do not like wasting time in exercising judgment hence follow the decisions of others. Dependence upon the behavior of others most easily substitutes for rigorous reasoning when knowledge is lacking or logic irrelevant. In a realm such as investing, where so few are knowledgeable, or in a realm such as fads and fashion, where logic is inappropriate and the whole point is to impress other people, the tendency toward dependence is pervasive. Banerjee (1992) states that it is doing what everyone else is doing, even when his or her private information suggests doing something quite different. He further argues that the very act of trying to use the information contained in the decisions made by others makes each person's decision less responsive to his or her own information and hence less informative to others.

There are several elements that impact the herding by an investor, for example: overconfidence, volume of investment, and so on. Waweru et al. (2008) identify stock investment decisions that an investor can be impacted by the others: buying, selling, choice of stock, length of time to hold stock, and volume of stock to trade.

Waweru et al (2008) conclude that buying and selling decisions of an investor are significantly impacted by others' decisions, and herding behavior helps investors to have a sense of regret aversion for their decisions. For other decisions: choice of stock, length of time to hold stock, and volume of stock to trade, investors seem to be less impacted by herding behavior.

Practitioners usually consider carefully the existence of herding, because investors reliance on collective information more than private information can result to price deviation of the securities from fundamental value; therefore, many good chances for investment at the present can be impacted. Academic researchers also pay their attention to herding; as its impact on stock price changes can influence the attributes of risk and return models and this has an impact on the viewpoints of asset pricing theories (Tan, Chiang, Mason & Nelling, 2008). Herding causes a chain of misleading information fuelling the anomalies on money markets. It causes a snowball-effect that is difficult to stop (Welch, 2000). According to Christian Hott (2009) stock price bubbles are mainly caused by herding behavior. When herding the general investing population commits more money to the market as it rises and less as it falls, behavior opposite from that which would generate profits.

Noise Traders are investors who make decisions regarding buy and sell trades without the use of fundamental data. They trade based on underlying emotions and psychological aspects unrelated to asset value they base their investing decisions on the underlying emotions and psychological biases. These investors generally have poor timing; follow trends, and over react to good and bad news.

Shleifer and Summers (1990), argue that noise traders may influence prices even in markets where some investors are well informed, because informed traders face risks that are likely to limit their actions. Fisher and Statman (2004) distinguish between information traders and noise traders.

Information trading is driven by the fundamental values of stocks (and other securities) whereas noise trading is driven by sentiment (Shefrin and Statman 1994). In an efficient market, there are only information traders and value alone determines prices. Noise traders can move prices away from fundamental value and render markets inefficient.

2.2.3 Signaling theory

A financing decision is a way in which a company can inadvertently signal its prospective investors. Choice of capital structure signals information to the market the signals will be validated in a competitive market (Ross, 2008). A good firm can distinguish itself from a bad firm by sending a credible signal about its quality to capital markets.

 The signal will be credible only if the bad firm is unable to mimic the good firm by sending the same signal. In efficient markets, the market provides accurate signals for resource allocation as market prices represent each security's intrinsic worth. Market prices can at times deviate from the securities' true value, but these deviations are completely random and uncorrelated (Chang, Kumar and Sivaraakishnn 2006).

Managers decide on the capital structure of their company in a way that a positive signal will be sent to the market to increase the firms value. This is only achieved if management issue debt securities in a way that the market will not perceive the issue as too large to invite possibilities of financial distress as this may pose a negative signal (Sharfstien and Stein, 1990). Signals not to or to invest in a particular stock might be ignored by an investor in favor of the observation that there are prior investors that did or did not invest in the stock This leads to a situation where a price spike can be viewed as a positive signal thus it is perceived as a good value investment by investors. Investors will follow the signal and purchase the stock, further driving the price higher. When share prices decline abruptly, a negative signal is sent to investor that signifies that the respective stock is a poor investment and should be sold.

2.3 Determinants of Stock Returns

The determinants of stock returns are related to risk, liquidity, price-level, growth potential, and stock price history. These determinants are common to the major equity Markets of the world. De Bondt and Thaler (1985), Jegadeesh and Titman (1993), Chopra, Lakonishok and Ritter (1992), and Jegadeesh (1990) show that the return history of a stock contains useful information in predicting relative returns. Fama and French (1992), Lakonishok, Shleifer, and Vishny (1994) and Davis (1994) show that future returns can be predicted by the relative sizes of (a) the current market price of a stock and (b) the current values of accounting numbers such as book value or earnings-per-share. These include market capitalization, market price per share, trading volume

2.3.1 Liquidity

A liquid market is one where traders can quickly buy or sell large numbers of shares without large price effects (Keynes, 1930). He considers an asset as liquid if it is more certainly realizable at short notice without loss. Liquidity is a key element for well-functioning stock markets as it has important repercussions for traders, and listed firms. Stability of the financial system benefits from liquidity (Black, 1971), (O'Hara, 1995) and (Harris, 1990) identifies several dimensions of liquidity. Harris (1990) distinguishes four. The first one is width, referring to the bid-ask spread for a given number of shares, commissions, and fees to be paid per share. Secondly depth, is the number of shares that can be traded at given bid and ask prices. The third one, immediacy, refers to how quickly trades of a given size can be done at a given cost. The final aspect is resiliency. This is how fast prices revert to former levels after they changed in response to large order flow imbalances initiated by uninformed traders. These different dimensions do not stand independently on their own, but may interact with each other.

O'Hara (2004) summarizes the two opposing sides under a dark view and a bright view on liquidity. The dark side points to the dangers of liquidity as a source of destabilization in markets. Liquid markets are focused mainly on the short term and investors ignore fundamentals when making their investment decision. The resulting instability can affect other markets and contagion might lead to instability in the financial system as a whole.

Bright view stresses the importance and the benefits of liquidity for a number of agents in financial markets, including traders, stock exchanges and listed firms. Investors are more likely to participate in the market if they are able to buy and sell stocks easily, quickly, and at low costs. This greater number of participants limits the price impact of trades and thus increases the stability in the market.

2.3.2 Risk

Risk refers to deviation of return from expected it the dispersion of actual returns around the expected return of an investment returns also known as market risk, this is the potential for the entire market to decline (investopedia dictionary). Brigham, Gapenski, and Daves (1999) describe risk as the chance of an unfavorable event occurring. There are two types of risks in the market Systematic risk that cannot be diversified away it is commonly measured by beta with a higher beta indicating a higher risk. Unsystematic risk is the risk that any one stock may go down in value, independent of the stock market as a whole. This risk may be minimized through diversification.

Investors usually choose less risky investment and less risky investments are better than those with higher risk (Kinder, 2002). Brigham et al. (1999) observe that the risk declines when a portfolio of assets is held than when an asset is a standalone. Based on the risk appetite of an investor, there is an increase in number of investment avenues available for investors. Thus high risk stocks will require higher returns to compensate investors for the higher risk assumed and lower risk investments will have a lower return as investors will readily accept this return in lieu of the les risk they are absorbing.

2.4 Empirical Literature Review

Cipriani and Guarino (2008) studied herd behavior in a laboratory financial market with financial market professionals. The study combines the advantage of the controlled experiment with that of observing the behavior of professionals, who are engaged in the day-by-day activity of trading, pricing, and analyzing financial assets.

This study compares two treatments, one in which the price adjusts to the order flow so that Herding should never occur, and one in which event uncertainty makes Herding possible. In the first treatment, subjects herd seldom, in accordance with both the theory and previous experimental evidence on student subjects.
In the second treatment, the proportion of herding decisions increases, but not as much as theory suggests.

Spyrou (2013) studied herding in Greece. The purpose of his paper was to provide a review of theory and empirical evidence on herding behavior in financial markets. Designed to review and discus of the literature available on herding, the major findings were that more than two decades of empirical and theoretical research have provided a significant insight on investor herding behavior. The major findings indicated the existence of herding in the Greece stock market.

Salamouris and Muradoglu (2010) in a study-estimating analysts' forecast accuracy using behavioral measures (Herding) in the United Kingdom, set to identify herding behavior on financial markets and measure the herding behavior impact on the accuracy of analysts' earnings forecasts. Two alternative measures of herding behavior, on analysts' earnings forecasts are proposed.

The first measure identifies herding as the tendency of analysts to forecast near the consensus. The second measure identifies herding as the tendency of analysts to follow the most accurate forecaster. They established that in both measures employed, a positive and significant relation is found between the accuracy of analysts' earnings forecasts and herding behavior. According to the first measure analysts, exhibit herding behavior by forecasting close to the consensus estimates. According the second herding measure, it is found that analysts tend to herd towards the best forecaster at the time. Finally, they concluded that the accuracy of analysts' forecasts increases as herding increases. This study triggers concerns for further research in the modeling of analysts' forecasting behavior.

Mwimali (2012) studied the existence of herd behavior: evidence from the Nairobi Securities Exchange. This study focused on the price implications of herding by investigating whether equity returns reveal the presence of herd behavior. Information asymmetry in capital markets could explain the existence of herding. It can occur either when investors are sharing the same information or facing similar circumstances and rationally making similar decisions, or when investors intentionally mimic the behavior of each other. As a result, investors may not optimize their decisions individually but take into account other investors' choices. The main objective of this research was to investigate the existence of herding behavior among the investors at the NSE. The study entailed an empirical research design. Data used was secondary data obtained from the Nairobi securities exchange. The data obtained was from April 1996 to December 2012 divided in three phases: 1996-1997, 1998-2001, and 2003-2012. The NSE share index was used as the sample.

Data was analyzed using a model developed by Christie and Huang (1995) where a regression analysis was on CSSD against dummy variables to determine the beta coefficients in the market. The regression produced statistically significant positive beta coefficients that reveal no presence of herding behavior among investors at the NSE.

Werah (2006) carried a study titled the influence of behavioral factors on Investor activities at the Nairobi Stock Exchange. The study set out to survey the influences of behavioral factors on investor activities at the Nairobi Stock Exchange. It mainly explored the role played by behavioral factors on investors' decisions. The results obtained suggested that the behavior of investment market participants was to some extent irrational.

2.5 Summary of Literature Review

The traditional classical finance theory dictates rationality in investor behavior. Behavioral finance theories on the other hand consider irrational qualities of investor. These theories have been studied over time but behavioral finance is rich in uncharted gaps. Fotini, Alexandros, and Nikolaos (2010) examined Herd behavior in Four Mediterranean Stock Markets using daily data from the Greek, Italian, Portuguese, and Spanish stock markets for the years 1998-2008. Herding was found to be stronger during periods of rising markets in these stock markets.

Christie and Huang (1995) examined the investment behavior of market participants in the US equity market. By utilizing the cross-sectional standard deviation of returns (CSSD). Chang, Cheng& Khorana (2002) examined the presence of herding across both developed and developing Financial markets including the US, Hong Kong, Japan, South Korea, and Taiwan. They documented evidence of herding in the stock markets of South Korea and Taiwan the two emerging markets in their sample. There was no evidence of herding on the part of market participants in the US and Hong Kong and partial evidence of herding in Japan.

Major issues investigated locally are; Jagullice (2013) sought to find out the effect of behavioral biases on individual investor decisions. The study established that individual investment decisions towards IPO were influenced by several cognitive biases than they did emotional biases. Musavi (2014) studied herd effect during initial public offers at the NSE there was no evidence of herding or its effect during IPO at the Nairobi securities exchange when analyzed as a whole, however when regressed individually, there was evident evidence of herding in five IPOS; Scan Group Limited, Eveready Limited, Safaricom Limited, Centum Investment Company Limited and CIC Insurance Group Ltd. Kahuthu (2011) investigated the presence of Herd instinct behavior and its effect on stocks volume and stock prices in Nairobi Stock Exchange The study showed that herd instinct behavior among investors have a direct effect on stocks traded and stock prices.

Herding as a behavioral heuristic has been extensively studied at the Nairobi Securities Exchange, there have also been studies of herding during extreme market situations such as during global financial crisis and specific investor analysis.

There are notable gaps that need further review; the mixed results on the existence of herding in the Nairobi securities exchange provide an area for further research. The effect of herding on stock returns at the Nairobi Securities Exchange is such a gap. This study sought to fill this gap by analyzing data from the NSE that constitutes 52.39% of shares trading owned by local individual investors, Local corporate having 25.39%, and the balance shared among East African and foreign investors.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter consists of the research methodology that was used in the study inclusive of the research design, target population, data collection, and data analysis.

3.2 Research Design

The research design adopted was descriptive research design that measured the variables in their natural state and studied them to arrive at the stock price and volume movements. This allowed data to be organized in patterns that emerged during analysis.

The population of the study comprised of all the shares of the 20 that comprise of the NSE 20 share index of companies listed at the Nairobi securities Exchange. The study sought to analyze stock returns for listed companies in the index and the return of the market index over a period of fourteen years from January 2001 to December 2014 the time period is to allow observation of the market over a longer time period to give weight to the research findings and capture as many events that have affected the securities market during this time period as possible such as; floating of major Initial public offer shares (Mumias in 2001,Safaricom in 2008 and KENGEN in 2006) ,the 2007/2008 Post Election Violence, the collapse of large stock brokerage firms such as Francis Thuo and Nyaga stock brokers and the global financial crisis.

3.3 Data Collection

Secondary daily equities securities price for the companies in the NSE 20 share index and the daily index performance from January 2001 to December 2014 was obtained from the historical statistics database from the NSE in this research. The use of the NSE 20 share index is because it is a price weight index thus appropriate when measuring returns and it is taken to represent all firms listed in the NSE, as it comprises firms from all segments in the NSE. Being the oldest index in the NSE thus can be used over the time period the study seeks to analyze. NSE 20 share index being an average performance of 20 large cap stocks in the market, the stocks are the most traded stocks where herding is likely to be exhibited.

The NSE information services historical database is a reliable source of data for shares price trading at NSE. The use of a series of the daily closing prices of a single stock ensures that one is examining an understandable and clearly defined market. In addition, daily price observations illustrate reactions to easily available information and inter observational data of fundamental importance that wider interval observations such as weekly or monthly cannot reflect.

3.4 Data Analysis

Data analysis is the separation of data into constituent elements and examining separately in relation to the whole a bid to grasp the overall meaning in relation to the research problem.

Descriptive statistics of mean and standard deviation of stock prices and the NSE 20 share index was calculated. Aspects of mean, skewness, and kurtosis as well as sample variance were calculated.

Stock returns were measured as follows:

$$R_{i,t} = \log \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

Where;

$R_{i,t}$ is the return of the stock i at time period t.

$P_{i,t}$ is the closing stock price of stock i at time period t

$P_{i,t-1}$ is the closing stock price at period immediately preceding time t

NSE 20 share index returns was measured as follows:

$$R_{m,t} = \log \frac{N_t - N_{t-1}}{N_{t-1}}$$

Where;

$R_{m,t}$ is the return of the NSE 20 share index at time period t.

N_t is the closing index at time period t

N_{t-1} is the closing index at period immediately preceding time t

Logarithm of price changes was used to standardize the results. Data processing was done by Microsoft excel. The study used the model framework of testing herding proposed by Chang, Cheng, and Khoran (2000).

$$CSADt = \frac{\sum_{i=1}^{n} |Ri,t - Rm,t|}{N}$$

Where;

$R_{i\,t}$ is the observed return of stock i at time t.

$R_{m,\,t}$, is the cross sectional average returns 20 stocks in the NSE 20 share index.

N the stocks in the index.

The above model is a better alternative to the Christine and Huang cross sectional standard deviation model ($CSSD_{t)}$. Christie and Huang (1995) supported that herding can be expressed using cross-sectional analysis of asset returns, since the smaller cross-sectional dispersion of returns indicates parallel movement with the cross sectional mean return, that is to say movement to some type of market consensus. This measure is affected by the existence of outliers thus the choice to use the cross sectional standard absolute deviation model.

The test for herding is to be done by the following regression model

$$CSAD_t = \alpha + \gamma_1 + R_{m,\,t} + \gamma_2 R_{m,\,t}^{2}$$

The relationship between $CSAD_t$ and $R_{m,\,t}$ is used to detect herding. If herding exists, then γ_2 will be significantly negative.

$\gamma_{1\,and}\,\gamma_2$ are the respective coefficients of the stocks i and market average.

A t test was done to test statistical significance of the coefficients at 95% confidence interval.

CHAPTER FOUR: DATA ANALYSIS RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter discusses the descriptive as well as the regression analysis of the price data. In descriptive analysis, the returns mean, variance, Kurtosis, skewness and standard deviation in comparison to that of the market is discussed. Regression analysis looks at availability and significance thereof herding value for γ_2.

4.2 Descriptive Statistics

Figure 1: Returns of NSE 20 Share Index 2001-2014 (Rm_t)
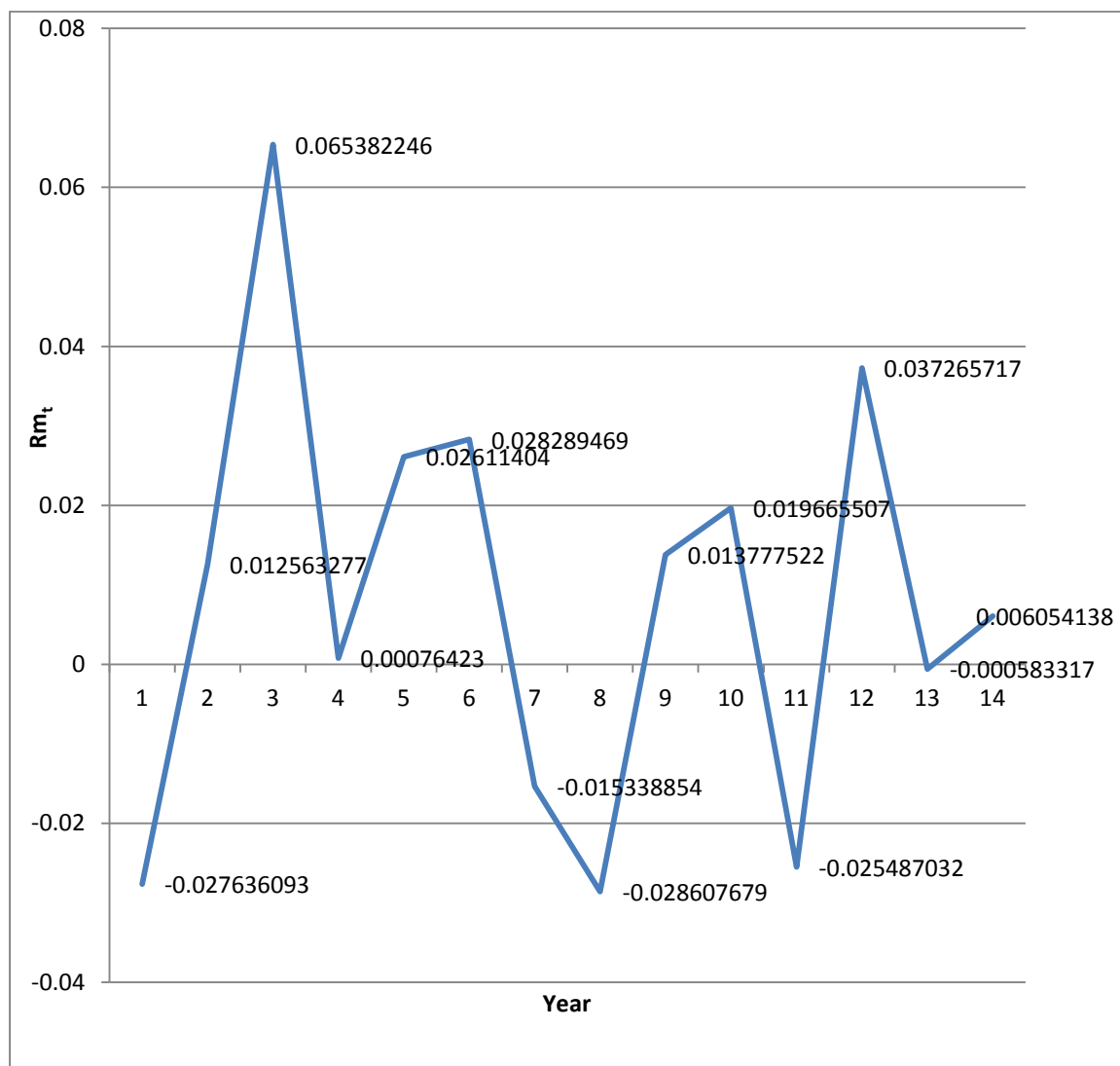
From the figure 1 above, the year 2003 exhibited the highest return of the 20 share index at 0.065 with 2008 having the lowest return at 0.285.

Table 4.1 below summarizes some relevant information about the empirical distributions of stock returns under consideration. The statistics reported are the mean, standard deviation, minimum, and maximum return. Skewness and kurtosis during the sample period.

Table 4.1: NSE 20 Share Index Descriptive Statistics

MEASURE	VALUE
MAXIMUM	5774.00
MINIMUM	1027.00
MEDIAN	3849.50
MEAN	0.0080159
STDEV	0.0561913
SKEWNESS	0.3816366
KURTOSIS	1.1842097
VARIANCE	0.0035756

According to the data in Table 4.1 for the period between 2001 and 2014, average returns of the index was 0.080159, standard deviation was 0.0561.

The variance was 0.0032756.the highest points the index achieved was 5774 and the lowest being 1027 points.

Table 4.2: Descriptive Statistics of NSE Index Composite Returns. ($R_{i, t}$) 2001-2007

	MEAN	STDEV	SKEWNESS	KURTOSIS	VARIANCE
Sasini Tea & Coffee Ltd	0.819	1.377	-2.447	6.177	1.895
Limuru Tea Co. Ltd	0.584	2.699	-1.013	-1.055	7.284
Express Ltd	-0.897	1.032	-1.066	1.697	1.066
Nation Media Group	-0.314	0.530	-2.066	4.378	0.281
Tourism Promotion Services Ltd (Serena)	0.559	0.621	-1.254	0.899	0.385
Barclays Bank Ltd	0.784	0.756	-2.061	4.576	0.571
C.F.C Bank Ltd	0.503	0.937	-0.613	1.681	0.877
Diamond Trust Bank Kenya Ltd	-0.144	7.708	2.573	6.713	59.416
Pan Africa Insurance Ltd	2.844	0.730	-0.790	-0.958	0.533
Standard Chartered Bank Ltd	0.590	1.342	-1.456	2.221	1.800
Bamburi Cement Ltd	-0.443	1.363	-0.094	-0.749	1.857
E.A.Cables Ltd	0.171	0.521	-0.860	-1.030	0.272
E.A.Packaging Ltd	-0.188	0.760	-2.140	4.883	0.577
E.A.Portland Cement Ltd	0.597	0.423	-0.601	-0.844	0.179
East African Breweries Ltd	0.926	0.536	0.181	-2.251	0.288
Firestone East Africa Ltd	0.370	1.369	0.229	-0.847	1.874
Kenya Power & Lighting Ltd	-0.838	0.843	0.665	-1.135	0.711
Total Kenya Ltd	-0.313	0.734	-0.442	-1.275	0.538
Unga Group Ltd	0.122	0.340	0.870	1.163	0.116
Standard Newspapers Group	0.668	0.001	0.000	0.000	0.001

Table 4.3: Descriptive Statistics of NSE Index Composite Returns. ($R_{i, t}$) 2008-2010

	MEAN	STDEV	SKEWNESS	KURTOSIS	VARIANCE
Rea Vipingo	0.07	0.76	0.42	4.38	0.57
Mumias	-0.12	0.62	-0.87	0.90	0.38
Sasini Tea & Coffee Ltd	0.42	0.72	1.73	4.58	0.52
Kenya Airways Ltd Ord	-0.26	0.27	-0.50	1.68	0.08
Nation Media Group	-0.05	0.82	-1.62	6.71	0.67
CMC Holdings	0.00	0.00	0.00	-1.88	0.00
Barclays Bank Ltd	0.11	0.81	-1.02	0.00	0.65
ICDC	0.00	0.00	0.00	-1.90	0.00
Equity Bank	0.14	0.97	-1.06	-2.88	0.93
Kenya Commercial Bank Ltd	-0.21	0.27	-1.56	1.92	0.07
Express kenya	2.17	2.17	1.59	-1.88	4.71
Standard Chartered Bank Ltd	0.35	1.17	-1.29	-0.80	1.36
Athi River Mining	0.15	0.33	1.65	0.33	0.11
British American Tobacco Kenya Ltd	0.11	0.16	1.65	1.10	0.02
Bamburi Cement Ltd	0.31	0.40	-1.29	2.00	0.16
kengen	0.10	0.94	0.47	2.20	0.88
E.A.Cables Ltd	0.62	0.34	1.69	6.50	0.12
East African Breweries Ltd	0.15	1.08	-0.48	4.00	1.17
Kenya Power & Lighting Ltd	-0.05	0.87	-0.11	3.80	0.76
Tourism Promotion Services Ltd (Serena)	0.28	0.48	1.73	1.52	0.23

Table 4.4: Descriptive Statistics of NSE Index Composite Returns. ($R_{i, t}$) 2011-2014

	MEAN	STDEV	SKEWNESS	KURTOSIS	VARIANCE
Sasini Ltd	0.05	0.07	1.41	1.55	0.00
Barclays Bank Ltd	0.05	0.10	1.67	3.66	0.01
CFC Stanbic Holdings Ltd	0.21	0.04	1.70	3.81	0.14
Equity Bank Ltd Ord	0.27	0.24	0.89	(3.00)	0.09
Kenya Commercial Bank Ltd	0.36	0.61	1.64	2.31	0.25
Standard Chartered Bank Ltd	0.10	0.11	1.27	(4.35)	0.01
The Co-operative Bank of Kenya Ltd	0.08	0.05	(1.73)	2.64	0.01
Kenya Airways Ltd	(0.06)	0.93	1.05	2.22	0.58
Nation Media Group	0.27	0.64	1.63	3.57	0.33
Scan group Ltd	(0.05)	0.02	1.72	3.65	0.01
ARM Cement Ltd	(0.06)	0.38	(0.20)	0.41	0.11
Bamburi Cement Ltd	(0.03)	0.10	(0.92)	(1.67)	0.02
KenGen Ltd	(0.06)	0.28	(1.01)	(3.37)	0.06
KenolKobil Ltd	(0.03)	0.06	1.13	2.10	0.02
Kenya Power & Lighting Co Ltd	(0.11)	0.19	(1.71)	1.71	0.03
British-American Investments Co (Kenya) Ltd	0.52	0.53	1.73	(5.34)	0.37
Centum Investment Co Ltd	0.37	0.29	1.33	(0.44)	0.26
British American Tobacco Kenya Ltd	0.47	0.77	1.73	0.43	0.40
East African Breweries Ltd	0.12	0.23	1.70	3.55	0.04
Safaricom Ltd Ord	0.31	0.50	1.40	(2.00)	0.18

4.3 Relationship between herding and average Return

Table 4.5: Overall Regression Analysis of The Market as a Whole when α and γ_1 take values of Zero

	2001-2007	2008-2010	2011-2014	Overall market
$CSAD_t$	0.015356	0.014194	0.00673018	0.0125
γ_1	0	0	0	0
γ_2	0.11344	1.9895	360.8676480497	69.84
α	0	0	0	0
$R_{m,\,t}$	0.01288	0.001612	0.004312	0.0080159
$(R_{m,\,t})^2$	0.000165	0.0000026	0.00001860	0.0000642

The total number of observations for the fourteen year period was 3556.The multiple R of the coefficient γ_2 in model was 0.6517,the R square thus was 0.04247 making the adjusted R square to be 0.227.The standard error of the γ_2 coefficient was 0.11 the number of observations were 3556.The t statistics for $\gamma_{2\ was\ 3.645}$ at a confidence interval of 95% confidence.

Chang, Cheng and Khorana (2000), proposed a model for testing herding in the market. Their model, which seeks to establish the Absolute Cross Sectional Deviation CSAD at time t, employs the entire distribution. Nairobi securities exchange when regressed as a whole for the whole period of study, the γ_2 coefficient is negative indicating that herding does not occur in the NSE. There was no evidence to back that up herding in the sub periods of the study as well.

CSAD equation for the complete fourteen-year period is thus:

$$CSAD_t = \alpha + \gamma_1 + R_{m,\,t} + \gamma_2 R_{m,\,t2}$$

$$CSAD_t = \alpha + \gamma_1 + 0.0080159 + 0.0000642((R_{m,\,t})^2$$

The P value of 0.53 at a confidence level of 95% indicates that these results were accurate and significant.

4.4 Discussion of the results

During the period under review, the years 2001-2014, an increase in the NSE 20 share index indicated that the NSE performance is on an upward trend with share prices of most shares increasing thus an upward trend in stock returns. Information cascade, can lead to stock market bubble and, in the opposite direction, a stock market crashes get started thus it is important for financial markets stability for herding not to be prevalent. The result of this study is adverse to the one that would have been expected given that the NSE is an emerging market securities which in financial literature is perceived to have with information asymmetry. The absence of herding at the NSE may be as a result of existence of arbitragers that led to reversal of any influence that herding had on stock prices hence change in overall returns on these stocks, these arbitrageurs may by far outweigh noise traders who are likely to herd thus revising any herding tendency by noise traders consequently correction the market.

The absence of herding in the NSE is confirmed by the work of Mwimali (2012), who used the more stringent measure of CSSD to test for the presence of herding. This is after this study incorporated the suggestions by Mwimali (2012) to use daily closing price data and a different analytical tool.

These finding however differ with the finding of Ombai (2010) who in his study investigating herding effect at the NSE during global financial crisis found evidence of herding among investor at NSE who observed a negatively significant $y2$ coefficient. And the findings of Kahuthu (2011) whose study on effects of herd behavior on trading volume and prices at the Nairobi Securities exchange observed that shown that herd instinct behavior among investors have a direct effect on stocks traded stock prices. Finally, the findings of Kimani (2011) who listed herding as amoung the behavioral factors that affect investment decisions of individual investors at the NSE are also contradicted by the findings of this study.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Focus is on a summary of findings, a discussion of these results with recommendations for further studies. It also highlights the implications of these results in policy and practice.

5.2 Summary of Findings

Evidence regarding the presence of herding at the Nairobi Securities Exchange appears mixed. The objective of this research was to investigate the effect of herding on stock returns. When data was analyzed during the whole period and during the sub study periods, both whole period regression and sub period regressions tested negative for herding. The results are an indication that investment at the NSE follows efficient market hypothesis thus rational pricing asset pricing.

The type of herding that is the focus of the study is market wide herding which arises when investors ignore individual characteristics of stocks and instead follow the performance of the market. It is based on the assumption that herding in the market is consistent with a non-linear relationship between dispersions (CSAD) and the corresponding equally weighted market return. This means that the dispersions will decrease or at least increase at a less-than-proportional rate with the market return. For the sub period 2001 to 2007, the $\gamma 2$ was positive 0.11344 in the sub period 2008 to 2010 $\gamma 2$ moved to a positive figure of 1.9895. For the final sub period of 2010 to 2014, the $\gamma 2$ measure of herding was 360.86.

The overall γ_2 for the whole study period was a positive figure of 69.86. From the preceding analysis, evidence from returns at the Nairobi Securities exchange show that herding does not occur in the Nairobi stock exchange hence it potential negative effect on returns was not observed.

5.3 Conclusion

This study used data on the daily stock returns of the NSE 20 share index composite companies as well as the returns of the 20 share index market index during a period of fourteen years from January 2001 until December 2014. The study concluded that there is no herding present in the Nairobi securities exchange thus herding had no effect on stock returns at the Nairobi Securities Exchange market as measured by using the Cross Sectional Absolute Deviation model of Chang, Cheng, and Khorana (2000).

There may exist many other factors that cause NSE market returns to move into a specific direction such that even when herding was present during the investigated period, its effect may be diminished to unobservable levels by the other influences on the securities market. The absence of herding and it effect on stock returns when the market is analyzed as a whole as evidenced by the dispersions of stock specific returns from that of the market does not exclude the possibility of herding by a certain group of investors in the NSE market such as foreigners or institutional investors. This can be discovered through a study implementing another measure of herding aimed at studying the phenomenon in these contexts.

Behavioral finance has become a popular area of asset pricing research especially herding and its potential effect on securities returns.

Relatively little empirical evidence exists in direct support of behavioral theories and assumptions. This is due, in part, to the fact that behavioral models cannot be tested as easily as traditional asset pricing models. Reasons as to why this is the case include the fact that the data used to measure behavioral attributes such as market returns data and trading volumes data reflects the decisions of both rational and behaviorally biased traders and separation of this data into the two subcomponents is not feasible. In addition, the standard tests of restrictions imposed by the equations of rational, utility-maximizing agents are inapplicable in measurements of herding and other behavioral attributes.

From evidence of this study, market participants tend not to herd around the aggregate market consensus; diversification of portfolio within the domestic market is still an optimal investment strategy in the NSE market. Investors in the securities exchange should thus follow traditional portfolio investment practices in their day to day investment decisions, as this will yield an optimal investment return.

Investigating herding allows for further understanding of the influences it has on the decision-making process of investors. Although a difficult phenomenon to investigate, its study   provides a deeper insight into the concept of herding at the NSE and draws attention to concept within it that require deeper scrutiny in future investigations.

5.4 Recommendations

There is a need for keener scrutiny on trading behavior of investors at the NSE with a view to mitigate against probable effects of herding on stock returns if the phenomenon was to occur. The management of the capital market authority and the NSE should strengthen policies that will help to protect investors from themselves. These policies include and not limited to rigorous investor training on the possible effects of irrational investments, strict adherence to upward and downward movement of stock prices thresholds as stipulated by law. The aim is to cushion the securities exchange, such measures will insulate the market from dangers of herding that can on the extreme lead to stock market crashes. Successful investing is more than choosing a particular stock; it is also, how you go about doing it. Educating investors is important in a bid to militate against potential poor investment choices.

Being aware of behavioral biases is the crucial first step in ensuring that the decision making process is not adversely affected by them. Rational decisions are more likely when there is sufficient information available to decision-makers and when that information is presented and analyzed to recognize common pitfalls. Investors should be aware of the potential impacts herding can have in their investment decision making process at all levels, either as individual or institutional investors trading on the floor of the stock market, and also investment managers, consultants and trustees.

Evidence of herding has been more pronounced in emerging rather than developed markets. Information asymmetry in emerging markets has long been the reason provided for such an observation. Bikhchandani and Sharma (2000) attribute this to the relative lack of transparency in these markets, weak reporting requirements.

Lower accounting standards, lax enforcements of regulations, and costly information acquisition inevitably lead to herd behavior. Chang et al. (2000) find similar results, collecting significant evidence of herding in South Korea and Taiwan, the two emerging markets in their sample, compared to the US, Hong Kong, and Japan, the developed markets in their sample. Additional research should be conducted to investigate the reasons why herding is not present in the NSE and what other behavioral biases are present in the securities exchange.

The major industry players need to be made aware of the potential influence they have on the investor public and the need to exercise caution when interacting with the less knowledgeable public. They represent the knowledgeable market participants whose opinions and decisions are likely to be imitated by other market participants leading to herding. This will prove true especially for individual investors who form about 54% of the investor population at the NSE, thus have a potential to shift the direction of the market.

5.5 Limitations to the Study

The frequent review of the composition of the NSE 20share index constituents meant that data set analysis had to make assumptions on the index composition when it was done in the middle of the year in order to allow for analysis. Instances of midyear changes are cooperative bank replacing Centrum in July 2008.When National Industrial Credit Bank, BOC, Uniliver, Kakuzi, Williamson, and Uchumi exited.

Being replaced by I.C.DC, KENGEN, Mumias, Rea Vipingo, Cooper Motors Corporation and express Kenya, in July 2007 and in October 2010 when Kenol Kobil replaced East African Cables.

Another limitation was on the data set obtained from the NSE that required a lot of data mining in order to come up with the appropriate data required for analysis. This process consumed a considerable amount of time thus limiting the amount of time allocated to other tasks. The daily price listing data provide by the NSE required reentry in a format that would allow for the measurement of the variables of interest.

The CSAD model restricts itself to detecting herding with respect to market returns. Therefore, it does not indicate who causes this herd behavior, thus, it does not distinguish between individual and institutional investors, foreign and local investors and all other sub composition of investors in the market. The model used does not incorporate statistical measures to differentiate between herding and reaction of investors to public or commonly available information. This may have impacted the overall results of the study.

One of the important limitations of the data is the usage of the NSE 20 share index stock that meant that only 20 stocks were studied out of all stocks trading in the market. This from a population of 61 stocks traded in the brouse is relatively small although representative of all industries, segments, and large market capitalization stocks.

Although daily return data are available starting from the beginning to the end of the study period, stocks were not consistently being traded on daily basis especial in the first years of the study 2001 to 2004. Thus trading price data was aggregated for the last date the share had traded.

Correction for thin trading are recommended by such methodologies of Miller et al. (1994), which requires estimation of moving average model reflective of the number of non-trading days was not done. This is due to the time limitation of the study that cloud not allow for such an exercise and a Owing to the difficulty of identifying the number of non-trading days of any individual stock.

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5.6 Suggestions for Further Studies.

This research was based on the NSE 20 share index; including the 20 major Nairobi, securities exchange stocks. Empirically comparing the relationship between CSAD and the market return for large stock with small stocks or use of other stock market indices such as the FTSE 15 share index or FTSE 25 share index would be of significant interest.

There is a need for the theory on the existence of herding to be further studied to provide for an indepth analysis of the phenomenon. This includes study of the phenomenon in the secondary market as a whole to include the bonds market segment. There is also a need to study the possibility of possibility of anti-herding that is largely ignored in the herding literature. Anti-herding dispersion in investment behavior is discussed in Hirshleifer and Teoh (2003).

Future tests for herding at the NSE can be conducted using data sets of volume and volatility measures, as opposed to only returns, as used in this study. It would be interesting to analyze herding from these other perspectives to provide further support for the behavior. Finally, the Study needs to be replicated in the same context but using different analytical tools and methodology.

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Appendix I

Most Recent Constituents of The NSE 20 Share Index December 2014

	AGRICULTURAL
1	Sasini Ltd.
	BANKING
2	Barclays Bank Ltd.
3	CFC Stanbic Holdings Ltd.
4	Equity Bank Ltd.
5	Kenya Commercial Bank Ltd.
6	Standard Chartered Bank Ltd.
7	The Co-operative Bank of Kenya Ltd.
	COMMERCIAL AND SERVICES
8	Kenya Airways Ltd.
9	Nation Media Group.
10	Scan group Ltd.
	CONSTRUCTION & ALLIED
11	ARM Cement Ltd.
12	Bamburi Cement Ltd.
	ENERGY & PETROLEUM
13	KenGen Ltd.
14	KenolKobil Ltd.
15	Kenya Power & Lighting Co Ltd.
	INSURANCE
16	British-American Investments Co (Kenya) Ltd.
	INVESTMENT
17	Centum Investment Co Ltd.
	MANUFACTURING & ALLIED
18	British American Tobacco Kenya Ltd.
19	East African Breweries Ltd.
	TELECOMMUNICATION & TECHNOLOGY
20	Safaricom Ltd.

Changes To The Constituents Of The NSE 20 Share Index From 2001 To December 2014

YEAR	MONTH	COMPANY EXITING	COMPANY ENTERING
2014	JUNE	MUMIAS	
		UCHUMI	
2011	DECEMBER	CMC HOLDINGS	UCHUMI
2010	OCTOBER	E.A CABLES	KENOL KOBIL
2009	JANUARY	CENTRUM INVESTMENT	COOPERATIVE BANK
2008	JUNE	DIAMOND TRUST BANK	EQUITY
		TPS SERENA	SAFARICOM
2007	JULY	NIC BANK	KENGEN
		BOC	MUMIS
		UNILIVER	CMC
		KAKUZI	REA VIPINGO
		UCHUMI	CMC
		WILLIAMSON TEA	MUMIAS

Appendix III: NSE 20 Share Index Average Returns 2001-2014.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Jan	0.0190	-0.0216	0.0311	0.0054	0.0385	-0.0276	-0.0670	0.0762	-0.2263	0.0180	-0.0504	0.0248	0.0334	0.0159
Feb	-0.0528	-0.0997	0.0321	-0.1272	-0.0012	0.0111	-0.0470	-0.0451	0.1333	0.1223	-0.0833	0.0191	-0.0341	0.0006
March	-0.0344	-0.0456	0.1486	-0.0227	0.0059	-0.0188	0.0127	0.1018	-0.0018	0.0393	0.0365	0.0535	-0.0329	0.0026
April	-0.0747	-0.0514	0.1240	-0.0070	0.0858	0.0807	-0.0379	-0.0300	0.0189	0.0021	0.0122	0.0293	0.0506	-0.0135
May	0.0128	0.0149	-0.0679	-0.1186	0.1332	-0.0207	0.0290	0.0019	0.1549	0.0229	-0.0270	0.0145	-0.0815	0.0006
June	-0.0217	0.0101	0.0362	0.1426	0.0025	-0.0002	0.0375	-0.0613	-0.0067	0.0230	-0.0580	0.0346	0.0413	0.0043
July	-0.0709	-0.0501	0.0509	0.0004	-0.0110	0.0533	0.0060	-0.0450	-0.0519	0.0036	-0.0733	0.0089	-0.0188	0.0475
August	-0.0697	-0.0153	0.1296	-0.0140	-0.0267	0.0878	-0.0421	-0.1009	-0.0313	0.0393	-0.0520	0.0274	0.0202	0.0228
Sept.	0.0514	0.0867	0.0324	0.0595	0.0277	0.0889	-0.0340	-0.1897	0.0259	0.0065	0.0679	0.0441	0.0298	-0.0118
Oct.	-0.0360	0.0412	0.1140	0.0311	0.0089	0.0566	0.0491	-0.0136	0.0344	-0.0569	-0.1004	-0.0154	0.0334	-0.0073
Nov.	-0.0458	0.1730	0.0004	0.0096	-0.0003	0.0055	0.0441	0.0539	0.0179	0.0086	0.0158	0.0122	-0.0341	-0.0085
Dec.	-0.0089	0.1086	0.1534	0.0502	0.0501	0.0227	-0.1344	-0.0915	0.0979	0.0072	0.0059	0.1943	-0.0144	0.0196
MEAN	-0.0276	0.0126	0.0654	0.0008	0.0261	0.0283	-0.0153	-0.0286	0.0138	0.0197	-0.0255	0.0373	-0.0006	0.0061
STDEV	0.0397	0.0782	0.0681	0.0729	0.0454	0.0435	0.0549	0.0813	0.0984	0.0407	0.0525	0.0525	0.0409	0.0177
SKEWNESS	0.6697	0.7450	-0.3265	-0.1713	1.3950	0.2397	-0.7614	-0.1808	-1.0411	1.0275	0.3155	2.7632	-0.5168	1.1851
KURTOSIS	-0.3340	0.1114	-0.5140	0.9546	1.7699	-1.5595	0.3573	0.2060	2.6783	4.3607	-0.9875	8.7459	-0.6406	1.4305
VARIANCE	0.0016	0.0061	0.0046	0.0053	0.0021	0.0019	0.0030	0.0066	0.0097	0.0017	0.0028	0.0028	0.0017	0.0003

Appendix IV: Average Stock Returns NSE 20 Share Index Constituents 2001-2007

	2001	2002	2003	2004	2005	2006	2007
Sasini Tea & Coffee Ltd	-0.16	0.86	0.80	0.91	0.92	1.09	1.31
Limuru Tea Co. Ltd	-2.48	0.63	0.91	1.26	1.07	1.25	1.44
Express Ltd	-4.74	-0.45	0.14	1.00	-4.74	1.14	1.37
Nation Media Group	-2.27	-0.52	-0.63	0.81	0.08	-0.36	0.68
Tourism Promotion Services Ltd (Serena)	0.39	-0.57	0.62	0.86	0.87	0.90	0.84
Barclays Bank Ltd	0.28	-0.37	1.00	1.36	1.29	1.10	0.82
C.F.C Bank Ltd	0.33	-1.11	0.58	0.93	0.79	0.89	1.11
Diamond Trust Bank Kenya Ltd	-0.30	0.27	-0.56	0.28	1.22	-0.09	-1.83
Pan Africa Insurance Ltd	0.44	-1.05	0.03	0.72	-1.40	20.21	0.95
Standard Chartered Bank Ltd	0.34	-0.11	0.88	1.19	-0.60	1.19	1.24
Bamburi Cement Ltd	-0.14	-1.16	0.42	-3.08	0.89	-0.43	0.40
E.A.Cables Ltd	2.17	-1.74	-1.26	1.11	-0.28	0.61	0.59
E.A.Packaging Ltd	0.31	-1.02	-0.76	0.12	-0.30	0.15	0.19
E.A.Portland Cement Ltd	0.50	-1.04	0.86	0.61	1.08	1.08	1.08
East African Breweries Ltd	0.29	0.43	1.17	1.46	0.90	1.07	1.16
Firestone East Africa Ltd	-0.22	0.11	0.88	0.15	1.05	-0.20	0.84
Kenya Power & Lighting Ltd	-1.63	-1.74	-2.76	0.67	-0.88	1.11	-0.64
Total Kenya Ltd	-0.65	-0.75	-0.17	0.67	0.96	-1.27	-0.98
Unga Group Ltd	-0.90	-0.04	0.44	0.34	-0.77	0.76	1.02
Standard Newspapers Group	0.28	0.32	0.62	0.68	1.29	0.85	0.64

Appendix V: Average Stock Returns NSE 20 Share Index Constituents 2008-2010

	2008	2009	2010
Rea Vipingo	0.00	-0.65	0.86
Mumias	0.00	-0.80	0.42
Sasini Tea & Coffee Ltd	1.25	0.00	0.00
Kenya Airways Ltd Ord	0.00	-0.55	-0.23
Nation Media Group	0.52	-0.98	0.32
CMC Holdings	0.00	0.00	0.00
Barclays Bank Ltd	0.80	-0.78	0.30
ICDC	0.00	0.00	0.00
Equity Bank	0.96	-0.92	0.38
Kenya Commercial Bank Ltd	-0.01	-0.52	-0.09
Express kenya	1.22	4.65	0.63
Standard Chartered Bank Ltd	1.29	-0.96	0.73
Athi River Mining	0.00	0.53	-0.07
British American Tobacco Kenya Ltd	0.00	0.29	0.03
Bamburi Cement Ltd	0.64	-0.13	0.44
kengen	0.00	-0.78	1.08
E.A.Cables Ltd	0.45	1.01	0.39
East African Breweries Ltd	1.17	-0.98	0.27
Kenya Power & Lighting Ltd	-0.03	-0.94	0.81
Tourism Promotion Services Ltd (Serena)	0.83	0.00	0.00

Appendix VI: Average Stock Returns NSE 20 Share Index Constituents 2011-2014

	2011	2012	2013	2014
Sasini Ltd	0.01	0.00	0.14	0.05
Barclays Bank Ltd	0.01	-0.01	0.18	0.02
CFC Stanbic Holdings Ltd	0.00	0.00	0.08	0.77
Equity Bank Ltd Ord	0.11	-0.05	0.42	0.60
Kenya Commercial Bank Ltd	0.09	-0.04	1.08	0.31
Standard Chartered Bank Ltd	0.04	-0.02	0.20	0.17
The Co-operative Bank of Kenya Ltd	0.05	-0.03	0.05	0.26
Kenya Airways Ltd	1.00	-0.25	-0.81	-0.18
Nation Media Group	0.10	-0.05	1.12	-0.09
Scangroup Ltd	0.00	0.00	0.04	-0.22
ARM Cement Ltd	0.25	-0.10	-0.50	0.11
Bamburi Cement Ltd	-0.08	0.04	0.11	-0.21
KenGen Ltd	-0.32	0.23	0.06	-0.23
KenolKobil Ltd	0.02	-0.01	0.11	-0.23
Kenya Power & Lighting Co Ltd	0.01	-0.01	-0.33	-0.10
British-American Investments Co Ltd	0.00	0.00	0.92	1.15
Centum Investment Co Ltd	-0.09	0.05	0.47	1.05
British American Tobacco Kenya Ltd	0.00	0.00	1.33	0.53
East African Breweries Ltd	0.02	-0.01	0.39	0.06
Safaricom Ltd Ord	-0.13	0.08	0.82	0.47