THE EFFECTS OF HERDING BEHAVIOR ON PORTFOLIO RETURNS AT THE NAIROBI SECURITIES EXCHANGE

BY

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE IN FINANCE, UNIVERSITY OF NAIROBI

2016

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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This research project has been presented for examination with my approval as the University Supervisor.

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ACKNOWLEDGEMENT

First of all, I thank the Almighty God for the far I have come and strength to carry out this research. Guidance, endurance, support, health and knowledge accorded to me to pursue this study.

Special thanks go to my Supervisor Dr. Cyrus Iraya. His profound knowledge, patience and guidance has been key to the success of my research. My gratitude also goes to Dr. Lishenga Lisiolo who was the moderator of my research for his valuable advice and knowledge passed on to me.

DEDICATION

To my Parents Patrick Murangiri Mutua and Monica Mwari Mwarania.

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ABSTRACT

Investors have a tendency to herd by making similar decisions or by mimicking the actions of others instead of making their own informed decisions. They end up making irrational decisions clinging on the belief that the crowd cannot be wrong. Information asymmetry could also explain the presence of herding behavior which is against the Efficient Markets Hypothesis.

The main objective of this research was to investigate the effect of herding behavior on the portfolio returns at the Nairobi Securities Exchange. The study entailed the descriptive research design. Secondary data was obtained from the NSE historical database which constituted of the daily prices data for the period between January 2010 and December 2015. The NSE 20 Share Index was used as a sample. Portfolio returns were computed and the regression analysis of the returns computed to test for herding. Cross-sectional absolute deviation model by Chang, Cheng and Khorana (2000) was used to test the presence of herding where the $\gamma 2$ coefficient was expected to be negative. The regression coefficient $\gamma 2$ was found to be positive therefore indicating no presence of herding or its effect on portfolio returns at the Nairobi Securities Exchange.

LIST OF ABBREVIATIONS

APT   **Arbitrage Pricing Theory**

CAPM   **Capital Asset Pricing Model**

CSAD   **Cross-sectional Absolute Deviation**

CSSD   **Cross-sectional Standard Deviation**

CMA   **Capital Markets Authority**

EMH   **Efficient Markets Hypothesis**

IPO   **Initial Public Offering**

NSE   **Nairobi Securities Exchange**

US   **United States**

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Research has been conducted to show how investors have irrational behavioral aspects that influence their decision making. For a long time, scholars have believed in the Efficient Market Hypothesis, Fama (1965) but are now being replaced by the modern finance theories of behavioral finance. The concept of herd behavior which is incorporated in the behavioral finance is seen to make individuals mimic the actions of others and make investment decisions that are the same with the majority around them. Investors are interested in having a collection of investments that have a lower risk than any individual asset. Attempting to maximize returns and minimizing risks forms the basis of choosing the proportions of various assets. The Modern Portfolio Theory by Markowitz (1952) reveals that investors' decisions are inclined towards holding a diversified portfolio of assets with the aim of reducing the individual asset risk exposure.

Herding refers to the tendency to lack of individual decision making which is characterized by investing in stocks simply because others are doing it. One of the fears investors are facing is that of missing out on an investment considered to be good. Their rationale is the unlikelihood of a large group to be wrong or that of social pressure of conformity. Therefore, the herd instinct is seen to be the cause of bubbles in Finance. Finance behaviorist attribute the irrational state of mind of investors to the human tendency of fearing to be left alone and other emotions such as greed and envy. Herd behavior can cause a change in the value of an asset. Fundamental value of an asset may

deviate from the asset value due to these behavioral aspects hence the market efficiency theory suffers (Mayo, 2009).

The behavioral aspects of investors can lead to influenced portfolio returns at the Nairobi Securities Exchange due to the herd instinct. Portfolio returns indicate how well a collection of assets can generate cash flows given the initial capital outlay. Investors may end up choosing the basket of investments that others are interested in with the consideration of the risk brought about by the portfolio. Performance at the NSE can be narrowed down to 20 blue chip companies which are represented by the NSE 20 share index. These companies are selected on the basis among them liquidity, track record of profitability and corporate governance. The index considers all the sectors under the NSE classification which include the manufacturing, energy and investments among others (NSE, 2016).

1.1.1 Herding Behavior

Herding behavior arises when investors are seen to mimic the investment decision by others rather than making their own informed decisions. Humans naturally want to belong to a community or a group for the fear of being left alone. Investors may not prefer to be left behind when others are reaping huge gains and as a result bringing in all speculators on board. The influence from others makes one believe that many cannot be wrong hence their decisions are equally right therefore easy to follow than making one's own informed decision given the information available in the market (Banerjee, 1992).

Suppression of private information may result to "information cascades" where less new information is reflected on the market prices as more individuals join the herd (Banerjee, 1992). Private information may be overwhelmed and hence the majority's decision is

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preferred to than making an individual decision. Market inefficiencies result from such incidences however it is important for an investor to have the ability to critically distinguish between the two correlated movements which may either lead to efficient allocation of assets or the one that leads to market inefficiency.

Academic researchers' attention has been diverted to herding due to the effects of investors' behavior on the stock price movements that may end up affecting their risk, return and in turn have implications on the asset pricing models. Profitable trading opportunities can be spotted when there is a deviation of prices from the fundamental value due to the reliance on collective information instead of the private information (Bikhchandani, Hirshleifer & Welch, 1992).

Herding differs with the type of investors. Increase in the reliance on private information is seen to grow together with investors' confidence. Confident investors are seen to be less interested in herding as compared to those who invest large amounts of capital leading to the tendency of following others' actions in order to minimize risks. Institutional investors are less prone to herding as compared to individual investors (GoodFellow, Bohl & Gebka, 2009).

Herd behavior can come from stereotypes or may be based on past experiences of individuals who participated in investing activities. One of the outcomes of herd behavior is financial over-reaction. This occurs whenever information is obtained from the herd, it is acted upon financially without proper verification of its authencity and the probability of occurrence or by scrutinizing the origin of the information. Bikhchandani et al. (1992), suggested that social equilibrium may shift radically if a little new information arrives and it suggests that a different course of action is optimal. The impact of herding

behavior on the market can be measured by dispersion which is the cross-sectional standard deviation of returns.

1.1.2 Portfolio returns

A portfolio constitutes a combination of different assets that a company has chosen to invest in. If the given portfolios are expected to yield the same return, then an investor will prefer the less risky one. If for a given level of risk, there exists an alternative portfolio that is deemed to bring better expected returns then the portfolio is likely to be preferred to the other one. Investors evaluate the trade-off between risk and return for decision making purposes. It is to be noted that an investor who requires a higher expected return then the investor should be in a position to accept more risk (Markowitz, 1952).

Investors are widely known to be risk averse therefore they opt to hold a diversified portfolio of assets rather than having a risky asset. They tend to go for the less risky portfolio among the portfolios that offer the same expected return. An efficient portfolio is one which at a lower level of risk or the same level, it offers an expected return which is higher if its compared with another investment. An efficient frontier illustrates different combinations of efficient portfolios in accordance to their level of risk and returns. An investor's profile can be plotted on the indifference curve using the different combinations of the risky assets which will depict the different possible portfolios. An efficient indicates an opportunity set for which it offers the highest expected return for a given level of risk (Merton, 1972).

A collection of assets, known as a portfolio, is more considered by investors instead of individual assets due to the rationale that the selection of the portfolio will enable the

choice of assets with the lower risk. Variance may be used to measure portfolio returns together with the standard deviation of the given assets' risk and their respective expected returns.

1.1.3   Herding Behavior and Portfolio Returns

Herding behavior may lead to a financial over-reaction. Investors may make a decision based on the collective opinion of the majority which may cause them to invest in the same assets. For example, if information is obtained that a certain security is doing better than the rest or is undervalued then investors may converge and form a portfolio of two or more securities that are deemed to yield the same expectations for investment purposes. The result may be the over or under pricing of the selected securities or even have an impact on the trading of the said securities which eventually may cause over or under trading in the securities market (Nofsinger & Sias, 1999).

According to the Efficient Markets Theory, securities' prices reflect all the information available to the market participants. These securities' prices are based on the forces of demand and supply in the market. Abnormal profits are difficult to make when the market is efficient since information is widely available and makes it impossible to set prices that are higher than the ones set by the market forces. Herding therefore creates market inefficiencies if the information available is not used to form investment decisions and instead opinions formed are preferred.

Hong, Kubik & Stein, (2005) revealed that herding existed among fund managers which was evident in the securities they purchased or sold in a particular quarter. We can deduce that their portfolio was constructed under the influence of the herd behavior in

order to achieve the same results. Portfolio returns may be influenced by the herding behavior in a negative or positive manner depending on the outcome of the herding.

Herding implicates stock price volatility which coincides with returns volatility. Stephen Ross, (1976) developed the Arbitrage Pricing Theory which takes into account the various risks that affect a security's returns volatility. The APT holds that it is impossible to make pure arbitrage profits, the rationale being that for a financial market, the equilibrium concept involves the trade-off between risk and return and therefore an investor has to condone a certain level of risk to get a return.

1.1.4 The Nairobi Securities Exchange

The Nairobi Securities Exchange (NSE) is the principal securities exchange of Kenya. NSE offers a platform for the trading and listing of securities and has been offering a robust, world class and well-regulated platform for the trading of bonds and equities. The NSE was registered under the Societies Act 1954, given the responsibility of regulating trading activities as well as developing the securities market. The NSE began as a voluntary association of stockbrokers.

The Nairobi Securities Exchange is regulated and licensed by the Capital Markets Authority (CMA). It is charged with the responsibility of providing a trading platform for securities listed in conjunction with member firms oversight. The stock ownership of the NSE as of December 2014 is; 7.3% CfC Stanbic Nominees Kenya Ltd, 3.37% Treasury of Kenya, 3.37% Investor Compensation Fund Board while the rest own 85.96% of the

Exchange. The NSE constitutes indices which include the NSE 20 Share Index, NSE All Share Index, FTSE NSE Kenya Government Bond Index among others (NSE, 2016).

Investor herding behavior has been seen in the Kenyan market. Kumba (2011), revealed that only 19 percent of the Kenyan population participates in shares investment in spite of the increase in the number of companies floating shares for the past recent years. Interests in the stock market investments are clearly seen through the Initial Public Offerings (IPO) such as those of Safaricom and KenGen. These stocks were oversubscribed showing a growth in the interest in the investment of shares. Herding behavior is evident in these IPOs since people end up buying or selling stocks without enough knowledge simply because others are doing it.

The returns of stocks at the bourse have depicted an upward trend with slump in returns only occurring when market conditions are extreme which include the global financial crisis, election period and the collapse of the major stock brokerage firm. The NSE 20-Share Index recorded the highest having achieved 5030 points on 18th February 1994. The International Finance Corporation rated the NSE as the best performing market in the world, with a 179 percent returns in dollars that year. (NSE, 2016).

The main business of the NSE is the stock and bond trading but it also has other investments. Derivatives exchange clearing services are carried out by NSE Clear Limited which is a subsidiary of the NSE and owned fully by the same. Central Depository and Settlement Corporation Limited is owned to the tune of 22.5% by the NSE and it provides for clearing, settlement and depository services. The NSE self-listed its shares on the Main Investment Market Segment and joined Johannesburg Stock Exchange to become the two exchanges in Africa to have self-listed.

The NSE 20-Share Index measures the overall performance of 20 blue chip companies which have positive financial results consistency and with strong fundamentals. The NSE Ltd 20 Share Index is basically a price weight index. The selection of members is based on a weighted market performance for a period of twelve months in terms of Market Capitalization 40%, Shares Traded 30%, Number of Deals 20% and finally, the Turnover 10%. The index primarily has its focus on the change of prices among these twenty companies (NSE, 2016).

1.2 Research Problem

The Efficient Market Hypothesis by Fama (1970), elaborates that the market is efficient in three forms namely; the weak, semi-strong and strong which means that the securities prices reflect fully the available information. If the prices do not reflect the available information, investors may decide to purchase the undervalued stocks causing an increase in the demand of those stocks and eventually equilibrium is achieved. This occurrence tends to bring about the under trading of overvalued securities and over trading of the undervalued securities.

The existence of herding behavior could be explained by the information asymmetry (Banerjee, 1992). Investors make risk-taking decisions similar to those around them in terms of the investments they make. Herding occurs when investors make similar decisions hence mimicking the behavior of each other therefore not taking into account their own choices. The agency problem is eventually created when investors rely on the advice of investment managers. Other problems associated with herding include asset

price bubbles, increased systematic risks, aggravation of the business cycle and deterioration of investment standards. This brings out the need to investigate the effects of herding on the returns at the NSE.

Kahuthu (2011) set to determine the effect of herding behavior on volumes traded and securities' prices at the NSE. The research investigated the correlation between the herd behavior and the trading volumes of securities as well as their prices. The population consisted of the nineteen brokerage firms registered by the Capital Markets Authority (CMA). The researcher used a survey design integrated with empirical analysis for the purposes of determining the relationship between the dependent and independent variable. Questionnaires were used to gather primary data which was placed under a Likert scale to measure the respondents' perception when making decisions on investments. Statistical Package for Social Sciences (SPSS) was used to analyze the data. The type of statistic used was descriptive. The study concluded that trading volumes and prices of securities have a positive correlation with the herd behavior.

Maloba (2012) investigated the presence of herd behavior in terms of the evidence from the Nairobi Securities Exchange. The main aim of the research study was to investigate whether there is existence of the herd behavior among the investors at the NSE. The data used was obtained from the NSE and it was secondary. The NSE Share index was utilized as a sample of the population for this study. A model developed by Christine and Huang (1995) was used to analyze data and entailed the utilization of a regression analysis which was on CSSD against dummy variables to determine the beta coefficients in the market. The regression was seen to produce positive beta coefficients which are statistically significant deducing that there is no herding existent among the investors at the NSE.

Ayuko (2015) studied the effects of herd behavior on the stock returns at the NSE. The main research objective was to investigate whether there was an impact of herding on the stock returns at the NSE. The researcher adopted the descriptive research design. Data used which was secondary was obtained from the Nairobi Securities Exchange historical database. Regression analysis of returns was computed to test for the existence of herding as suggested by Chang, Cheng and Khorana (2000). The regression coefficient was found to be positive depicting no evidence was present on herding on the stock returns at the Nairobi Securities Exchange. To bridge the knowledge gap, this study is set to establish the effect of herding on the portfolio returns at the NSE and consequently answering the questions; Does herding behavior exist among investors at the NSE? What is the impact on the portfolio returns?

1.3 Research Objective

To determine the effect that herding behavior has on the portfolio returns at the Nairobi Securities Exchange.

1.4 Value of the study

The findings of the research study will be beneficial to a number of interested parties. Investors will be able to understand the rationale behind herding, be able to differentiate when to herd and when not to. However, this study will sensitize investors to make their owned informed decisions keeping in mind that herding has influence on decision making. Investors will be more cautious since they are aware of the need to belong somewhere leads to herding. Various investors will confidentially make choices that are

better and selections of portfolios to invest in thereby be able to maximize their wealth and gain more confidence in their decision making in regard to their investments options.

The study will particularly be useful to academicians and scholars by being a basis for further research in order to close up on knowledge gaps. Academicians and scholars will through this research, be in a state to compare the studies done with this one and achieve a better understanding of the relationships herding can have on various returns in the stock market. Portfolio managers may also gain in terms of the decisions they will make to enable maximize the shareholders' wealth which is their main goal as agents of the shareholders.

The CMA and the NSE management will be in a position to know when there's herding and how to counter it to avoid the financial overreactions. The regulator will be able to come up with policies which will protect the interests of investors. The government will also benefit in terms of the knowledge on the policies it can lay to control for the purposes of attracting local and foreign investors to participate in investing activities that will drive the economic growth vehicle. Foreign investors will also gain more confidence to invest in our country's securities market.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This study investigates the impact herding has on the portfolio returns at the NSE. This part has a purpose to provide readers with the insight on the theories and scholarly work done on the studies related to this subject. This chapter will look into the theories and empirical studies done and in the end conclude on the literature review summary.

2.2 Theoretical Review

For a long time, studies have been carried out in finance using theories such as the Capital Asset Pricing Model (CAPM) and Efficient Market Hypothesis (EMH) have been used to determine and predicting certain events. Anomalies and human being behaviors' have been found to have influence on decision making hence the behavioral finance field has gained popularity.

2.2.1 Modern Portfolio Theory

The Modern Portfolio theory was developed by Harry Markowitz in 1952 which explains how portfolio returns can be maximized in consideration of the risk involved in the chosen portfolio. Risk can be minimized while considering the expected return level through the choice of asset's proportions that form the portfolio. This involves the diversification of investments via the choice of assets collections with consideration and comparison of the collection's risk with the individual asset's risk. This theory views an asset's return as an elliptically distributed random variable or as a normal distribution

function. It suggests on the minimizing the total variance of a portfolio returns which are not positively correlated (Markowitz, 1952).

Investors are seen to have risk aversion tendencies which lead them to preferring the less risky portfolio among the portfolios yielding expected return that is the same. The changes in prices of assets are considered importantly relative to the changes in prices of the assets constituting a portfolio. Exposure to individual asset risk can be reduced by an investor through holding a diversified portfolio of assets. This idea was brought about by Markowitz and reinforced by economists and mathematicians. The merits of the assets should be considered when forming an investment portfolio.

Andrew Brennan (1956) advanced the idea on the limitation of variance through portfolio theory. The efficient frontier was another concept introduced by Markowitz in the Modern Portfolio theory. Under this concept, an efficient portfolio is deemed to be one which yields high returns given a lower or same level risk when compared to a different type of investment. The efficient portfolios plotted relative to their risk and return form an efficient frontier. An investor's profile can be illustrated by indifference curves where plotting of combinations of risky assets is done which leads to defining the combination of possible portfolios in the space region. The boundary formed on the left side of this region is a hyperbola which is positively (upwardly) sloped. The opportunity set for which a certain amount of risk offers expected return that is highest is represented by the efficient frontier (Merton, 1972).

2.2.2 Efficient Market Theory

The Efficient Market theory developed by Eugene Fama (1970) states that securities' prices reflect the available information to the participants in the market. Every rational

buyer and seller is seen to possess the goal of maximizing their profits among other expectations. Competition among investors is seen when they try to gain from prediction of values of the securities in the future. It is equally of essence to point out that in an efficient market, it is impossible to make abnormal profits by setting a higher price than the one set by the market forces of demand and supply since information about securities is usually widely available. For an efficient market, the intrinsic value is best estimated by the security's actual price. (Fama, 1965).

Market efficiency was further classified into three categories, namely; the weak, semi strong and strong form. These three forms are distinguished by the type of information available to the market participants. The weak form efficiency which depicts market's efficiency refers to full incorporation of past information in the stock prices. The past information may be obtained from sources like the financial statements. When the current market prices reflect information available publicly together with the past and present information, the market efficiency is said to be in the semi strong efficiency. Market prices are seen to adjust whenever relevant information is released making it difficult to make abnormal profits from the published data and analysis of published financial statements. To finalize on the efficiency forms, the strong form efficiency occurs when past, present and privately held information are reflected by the prices of securities. Insider information distinguishes the strong form from the semi strong form (Fama, 1991).

Shares seem to be properly valued therefore, firms should not wait in order to issue new securities if the market is efficient. In addition, the market has the capability to absorb any number of securities since the volume of shares will not affect their prices (Shleifer,

2000). It is impossible to outdo the market for the reason that the share prices are caused by the stock market efficiency to reflect all the available relevant information (Fama, Fisher, Jensen and Roll, 1969).

2.2.3 Behavioral Finance Theory

Behavioral finance theory developed by Kahneman & Tversky (1974) has attained popularity to investors recently. It attempts to explain the causes of anomalies observed and those reported in the finance literature. Psychologists proposed this model arguing that people often suffer from cognitive biases as well as emotional biases leading them to act in an irrational manner. The traditional finance model clings to the rational behavior of human beings as one of the assumptions. The award of 2002 Nobel Prize in Economics to Psychologist Daniel Kahneman in conjunction with experimental economist Vernon Smith was seen as a sign of greater acceptance of this ideology.

Traditional finance has the notion that securities' prices are a true reflection of the intrinsic value which is their unbiased estimate since markets are efficient. Alternatively, Behavioral finance implies that heuristic-driven biases and errors, social and emotional influence, and frame dependence can cause discrepancy between market price and fundamental value. Judgement may be impaired by cognitive errors and heuristic-driven biases such as representativeness, anchoring, overconfidence, a version to ambiguity and innumeracy.

Ogilo (2012) elaborates representativeness as a heuristic-driven bias where people assume commonality between objects that seem to possess similar appearance. A judgement is made on the basis of how a decision corresponds to other decisions by the population in general. Judgements are made based on stereotypes. Shiller (2000) revealed

that people end up following decisions of others simply because they waste time in exercising judgement. According to Hersh Shefrin & Meir Statman (2000), investors have a psychological tendency to build their portfolios as a pyramid of assets having a proportion in stocks, bonds, options among others. This is due to investors goals such as safety, income and growth.

2.3 Determinants of Portfolio Returns

Portfolio returns can be maximized as long as the portfolio construction was done well. Portfolios that are successful are usually based on reasonable expectations and research rather than intuition. Many portfolios have failed because investors attempt to guess which stock or asset will perform better tomorrow. Brinson, Hood and Beebower (1991), examined the effects of investment policy, market timing and manager selection on the returns of a portfolio. The investment policy identifies the long term plan of allocating assets including their classes and weights. This is done with the aim of controlling the overall risk as well as meeting the fund objectives.

2.3.1   Asset Allocation

Asset allocation is an investment portfolio technique whereby, an investor focuses in balancing risk while diversifying by distributing assets among cash, stocks, real estate, derivatives and bonds. For these asset classes, each has a different level of risk and return therefore they are expected to trend differently. This may act as a cushion for investments since one asset category may increase in value while the others may be stagnant or decreasing in terms of their value. Brinson, Hood and Beebower (1991), argued that investment policy accounts for 94% of the variation in returns in a portfolio.

2.3.2 Risk and Return

Risk usually refers to the deviation of the expected return from the actual returns. Standard deviation is used to measure risk. A higher standard deviation indicates a higher degree of risk. Investors therefore, prefer less risky investments than those with higher risk and use this as their criteria during selection (Kinder, 2002). High risk investments require a high return in order for them to be attractive to investors. An investment with a higher return compared to another one with the same level of risk is considered to be more attractive and therefore, will be of preference to investors. The greater the amount of risk taken willingly by an investor, the greater the expected return.

Risk can be subdivided into systematic and unsystematic. Unsystematic risk, also known as specific risk, is dependent on the nature of the company and the industry you invest in. it can be reduced through the diversification of investments. Systematic risk on the other hand, is the uncertainty experienced across the entire market. To mention just but a few sources of systematic risks, are the recession, wars and interest rates. Brigham, Gapenski & Daves (1999), suggested that when a portfolio is held, the risk is lower compared to an individual asset. Investors may be encouraged to hold a portfolio rather than invest on an individual asset. Portfolio returns are thus determined by the amount of risk the investor is willing to take with the collection of assets forming the selected portfolio.

2.3.3 Liquidity

Keynes (1930) suggested that liquidity in a stock market can be attributed to the quick buying or selling of large number of shares by traders without large price effects. An asset is considered to be more liquid if it can be realized in a short period without loss. Liquidity is deemed to be one of the key elements of a well-functioning stock market.

Harris (1990) identifies several dimensions of liquidity whereby he distinguished four of the dimensions named as width, depth, immediacy and resiliency. These different dimensions are seen to interact with each other and not independently. Low cost and ease to trade either by buying or selling of stocks is attractive to investors' participation in the market.

2.4 Empirical Studies

Studies have been conducted with as basis of historical data ignoring the estimation of risk of a portfolio by Markowitz, Sharpe, Kraus, Litzenberger, Kroll, Levy, and Chunhachinda et al. Another study was carried out by taking into account the estimation of risk of a portfolio which proposed the use of Bayseian or efficient frontier approach using historical data in conjunction with Monte Carlo estimation process was done by Stein, Chen and Brown, Horst, Klen and Bawa, Jorion et al. Studies were done by Polson and Tew and Pastor on the asset pricing approach by introducing a factor model of arbitrage. They used the factor model to benchmark a portfolio performance that is recommended.

Mwimali (2012), investigated the existence of investor herding at the NSE. Existence of herding could be explained in capital markets where investors share the same information or face similar situations, end up making same decisions or tend to mimic the decisions of other investors. This may cause investors not to optimize their individual decisions for the preference of considering other investors' choices. This study's objective was to investigate whether among investors herding is evident. The data used to carry out the study was secondary which was sourced from the Nairobi Securities Exchange. This data retrieved was from April 1996 to December 2012 divided into three phases; 1996-1997,

1998-2001 and 2003-2012. The sample used was the NSE Share index. A model by Christine and Huang (1995), was used to analyze the data. The model advocates for the use of regression analysis on CSSD against dummy variables to determine the beta coefficients in the market. The regression reflected statistically significant positive beta coefficients which depict no presence of herding behavior among investors at the NSE.

Coral and Markowitz (1999), suggested that the local stocks preference has spread to mutual fund managers whereby they expressed a tendency to show inclination to stocks that are within the regions they are based. This behavior was seen to be evident even among the professional money managers. Hong et al (2005), revealed that mutual fund managers are interested in purchasing stocks which other managers in the same region are more likely to invest in therefore, the social interaction between the money managers may lead to a word of mouth impact on portfolios. Hong et al (2004), indicates that agents consider and follow judgements made and heard in social gatherings rather than using their analysis of stocks combined with the survey. Church, parties and weddings attended are a venue for social activities which may make agents successful which influence decision making. Agents play a key role to influence the participants on the stocks to invest in.

Lamoreux and Lastrapes (1990) developed a herding measure which is more commonly used to detect herding. LSV measure encompasses the detection of whether investors are mostly participating in buying or selling during their trading which differs if investors are trading independently. Empirical test for herd behavior were done by the use of investment behavior of 769 US tax-exempt equity funds managed by different money managers. Their conclusion was significant herding is not exhibited by money managers.

However, herding behavior was seen to be relatively prevalent in small companies' stocks as compared to the stocks of large companies. This was deduced from the view that there is presence of limited information that is available publicly on small stocks resulting to actions of fellow investors being followed by money managers while making investment decisions on these small stocks.

Hwang and Salmon (2006), developed a new measure of herding during their study of the US and South Korean markets. This model is price-based whereby herding is measured on the basis of the cross-sectional dispersion of the factor sensitivity of assets. In addition, investors' perception of risk-return relationship of assets may be distorted if they are behaviorally biased. If they happen to herd towards the market consensus, there will be a possibility that individual assets return will follow the market movements and so CAPM-betas will eventually deviate from their equilibrium values. Keynes (1936), suggested that herding and stock returns are likely to be affected by fundamentals at the market or individual level firm.

Kahuthu (2011) studied the presence of the herd instinct behavior and its effect on stocks volume and prices at the Nairobi Securities Exchange. Herd behavior is seen to be an action or activity done under the influence of other's ideas without prior rational thinking. the herding behavior can be demonstrated by activities such as hasty trading in stocks during initial public offerings (IPO). The study used a survey design which was integrated with empirical analysis aiming at establishing relationships between herd instincts and the trading volumes of securities together with their prices. Data used was collected from investors who either relied on financial analysis from various experts or were influenced by other investors to participate in the trading of securities. The

empirical evidence data was obtained from the Capital Markets Authority and Nairobi Securities Exchange. When determining herding existence, the researcher used chi-square method whereas the use of statistical tools like graphs and charts were used to indicate the effect on traded volumes. The research also revealed on the effect of herd instinct behavior on prices with the use of the correlation model. There was a positive correlation ranging from positive 0.6 to positive 1. The study therefore concluded that herd instinct behavior among investors have an effect on stocks traded ad their prices.

Spyrou (2013), focused the research on herding in Greece. The objective of the paper was to review empirical evidence and the theory on herding behavior as exhibited in financial markets. The major findings were that theoretical research has provided a significant insight on investor herding behavior for more than two decades. These findings indicated the presence of herding in the Greece stock market.

2.5 Conceptual Framework

Behavioral Finance has contributed to the quest for knowledge on investors' reactions to information and their decision making ways. Kahneman & Tversky (1974) revealed that representativeness, herd behavior and overconfidence are common heuristic forms. Heuristics are rules of the thumb which have been proposed to deduce how people solve their problems, make decisions or pass judgements.

Several studies have been carried out to investigate the impact of herding on a number of aspects in the stock market. This study sought to determine the effect that herding behavior has on the returns of a portfolio at the NSE. Given other researchers' point of

view together with the observations on the subject of research, this study will link up the consequences on the portfolio returns attributed to the presence of herding.

Figure 2.1: Conceptual Framework

Independent Variable   **Dependent Variable**

Herding Behavior → Portfolio Returns
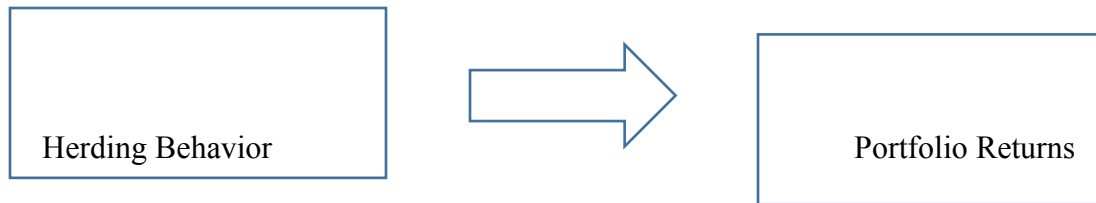
2.6 Summary of Literature Review

Investors are deemed to be rational in their behavior according to the traditional finance theory. Mwimali (2012) set to investigate the existence of herding behavior evident in the Nairobi Securities Exchange, revealed that there is no presence of herding behavior among investors at the NSE. Siloya (2015) set to determine the effect of herding behavior on the stock returns at the NSE revealed that there is no evidence of herding and its effects on stock returns at the Nairobi Securities Exchange.

Behavioral finance has shed light on the irrational behaviors noted on investors activities and actions. Studies done at the NSE depict the existence of herding on stock returns, trading volumes and prices but none has been done on the impact herding has on portfolio returns. The findings of the study will enlighten on the effects if any and add on to the available literature on herding.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter constitutes the research methodology that was used in the study. It encompassed the research design to be adopted by this research, the target population for the study, the sample used, the data collection methods and techniques used to analyze the data.

3.2 Research Design

With regard to the research problem at hand, this study required the use of both quantitative and qualitative research design (Saunders, 2009). Quantitative research design was useful in finding out the dependent and independent variable. According to this study, the dependent variable is the portfolio returns while the independent variable is the herding behavior. Qualitative research design assisted in gaining a deeper understanding of the relationship.

3.3 Population

The Population of a study constitutes the individuals, group of participants or objects which are the main focus of a scientific query. The target population of the study composed of the companies listed at the Nairobi Securities Exchange. Currently, the NSE has listed 64 companies.

3.4 Sample Design

The sample consisted of 20 companies which were selected through the use of purposive sampling out of the total number of companies listed. This method was chosen because information is readily available and above all, it was necessary to obtain information from specific target group. This sample was a good representation of the population.

3.5 Data Collection

The data for the research was secondary in nature and was obtained from the Nairobi Securities Exchange. The use of NSE 20 Share index was for the reason that it is a price weight index hence appropriate when measuring returns. It was equally important since it represents all firms listed in the NSE from all sectors. Due to the fact that NSE 20 Share index is an average performance of 20 performing stocks in the market, the stocks are prone to the herding behavior because they are the most traded.

The historical database for NSE information services was a reliable source of data for share prices trading at the NSE. Daily price observations exhibit reactions to easy and available information.

3.6 Validity and Reliability

The results of the study were inherently repeatable and the significant results were more than a one-off finding. The study considered all the requirements of the scientific research methods, for example, the randomization of the sample group.

3.7 Data Analysis

A model by Chang, Cheng & Khoran (2000) was used in the analysis of the data in this study. Although the cross-sectional standard deviation of returns is an intuitive measure for herding, it can be also affected by the existence of outliers. One of the challenges associated with this approach is that it requires clarity on the what is referred to as extreme returns. Investors may differ in their definition of the extreme returns and the characteristic of the return distribution may change over time. Furthermore, herding may occur over the entire distribution but becomes more inclined during periods of market stress. When applying this method, the short history of the NSE market might make it difficult for investors to identify when extreme returns occur. Data to be used was obtained for the period between January 2010 and December 2015 on a daily basis.

Under the traditional definite of herd behavior, the measure of its market impact is dispersion which is defined as the cross-sectional standard deviation of returns. Dispersions quantify the average proximity of individual returns to the mean.

The portfolio to be used for the study was formed and constituted by the 20 companies in the NSE 20 Share index. The returns of the stocks forming the portfolio was computed using the below formula;

$$Ri = \frac{d1}{Po} + \frac{P1 - Po}{Po}$$

Where;

Ri is the return on the stock

d1 is the dividend at period 1

Po is the initial stock price

P1 is the ending stock price at period 1

The returns of the NSE 20 were measured using;

$$Rm, t = \frac{\log Nt - Nt-1}{Nt-1}$$

Where;

Rm, t is the return of the NSE 20 share index at time period t.

Nt is the closing index at time period t

Nt-1 is the closing index at period immediately preceding time t

In presence of herding, the investors' decisions will be solely on market movements, so that the returns of individual assets would be similar to the overall market returns. To standardize the results, logarithm of price changes was used. Chang, Cheng and Khoran (2000) proposed a model framework for testing herding which was used in the study. According to Chang *et al.* the return dispersions will decrease (or increase) at decreasing rates in case of moderate to severe herding. Furthermore, proposing that this relationship

should be negative and non-linear in existence of herding. The Cross sectional absolute deviation (CSAD) is a measure of dispersion given by Chang et al and is as below;

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

Where;

Ri is the observed return of stock i at time, t

Rm, t, is the cross sectional average returns for the stocks constituted in the NSE 20 Share index

N refers to the stocks in the index

This model, unlike the Christine and Huang (1995), cross sectional standard deviation model CSSDt, is not affected by the existence of outliers therefore the Cross-sectional absolute deviation is deemed to be a better alternative.

The test for herding was done using the regression model stated below;

CSADt = α+γ1Rm, t+γ2Rm, t2

The relationship between CSADt and Rm, t shows the existence of herding. If Coefficient γ2 is significantly negative, then herding exists. A t test was done to test significance of the coefficients statistically at 95% confidence interval.

CHAPTER FOUR: DATA ANAYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter discusses the descriptive as well as the regression results of the daily price data. The descriptive analysis entails variance, standard deviation, mean, skewness and kurtosis in relation to the portfolio volatility as measured by the standard deviation. The study was conducted on firms that constitute the NSE 20 Share Index from the period of 2010 to 2015 bearing in mind the volatilities experienced in the year 2008 through 2010 as a result of the global financial turmoil. Data was analyzed using the regression analysis.

4.2 Descriptive Statistics

Figure 1: Portfolio Returns Vs Volatility

Portfolio Returns Vs Volatility
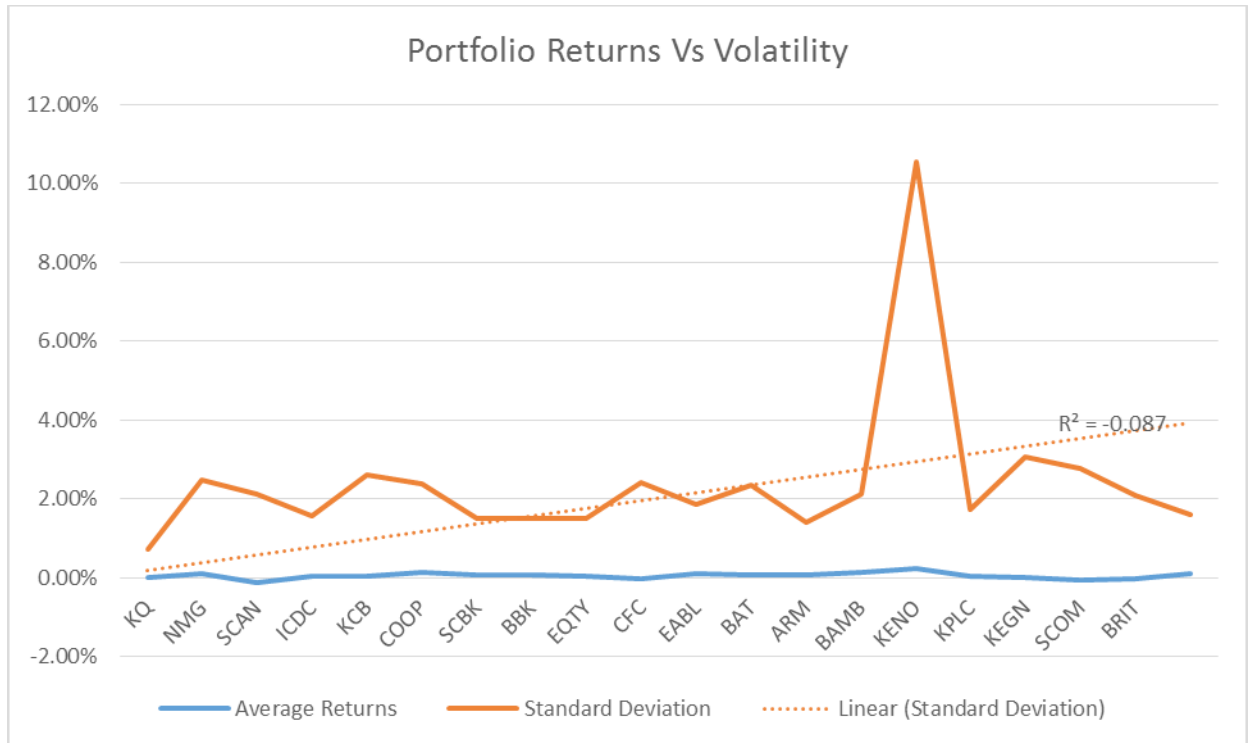
From the figure above taking a general view of stock returns of the constituents of the NSE 20 share index constituents it is observed that the R squared which is the coefficient of determination is 0.087 which means that only 8.7% of changes in stock returns can be explained by volatility or standard deviation of market returns. It is therefore appropriate to establish the presence of herding behavior using portfolio returns which are more standardized as compared to stock returns.

The portfolio weighting was done as at 31st December 2015 as follows. The weighting was done in relation to prices as it is known that the NSE 20 share index is a price weighted index.

RP = w1R1 + w2R2+ Wn Rn

Where:

W 1 is the weight of security one

W2 is the weight of security two

R2 is the return of security one

R1 is the return of security two

Wn weight of the nth Security

Rn Return of the nth security

Table 4.1: Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Port_returns	1502	.0317	-.0023	.0294	.0881	.000059	.0000231
Standard_dev	1502	.1334	.0000	.1334	2.2026	.001466	.0000962
Valid N (listwise)	1502						

Descriptive Statistics

	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Port_returns	.0008940	.000	23.608	.063	773.986	.126
Standard_dev	.0037269	.000	29.817	.063	1048.070	.126
Valid N (listwise)						

According to the tables above for the period between 2010 and 2015 the average portfolio returns was 0.00059 standard deviation was 0.0008940. The variance was 0.0000; the highest intraday portfolio return was 0.0294 and the lowest being -0.0023.

4.3 Regression Analysis and Hypotheses Testing

Table 4.2: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.796[a]	.633	.633	.0005415	.633	2591.735	1

Model Summary[b]

Model	Change Statistics		Durbin-Watson
	df2	Sig. F Change	
1	1500[a]	.000	2.054

a. Predictors: (Constant), Standard_dev

b. Dependent Variable: Port_returns

Adjusted R squared is coefficient of determination which tell us the variation in the dependent variable due to changes in the independent variable, from the findings in the above table the value of adjusted R squared was 0.633 an indication that there was variation of 63.3% on portfolio returns companies that constitute the NSE 20 share index due to changes in the independent variable which is herding behavior measured by volatility or standard deviation at 95% confidence interval. This shows that 63.3% of changes in constituents of the NSE 20 share index could be attributed to herding behavior measured by standard deviation of market returns. R is the correlation coefficient which shows the relationship between the study variables, from the findings shown in the table above there was a sizable positive relationship between the study variables as shown by 0.796.

Table 4.3: Collinearity Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.000	.000		-14.739	.000
	Standard_dev	.191	.004	.796	50.909	.000

Coefficients[a]

Model	95.0% Confidence Interval for B		Collinearity Statistics	
	Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	.000	.000		
Standard_dev	.184	.198	1.000	1.000

a. Dependent Variable: Port_returns

Table 4.4: Correlations[a]

Model	Standard_dev
1 Correlations Standard_dev	1.000
Covariances Standard_dev	1.406E-005

a. Dependent Variable: Port_returns

From the data in the above details the established regression equation for the time series data was

$Y = 0.00 + 0.191D$

From the above regression it was revealed that holding herding behavior to a constant zero the portfolio returns would stand at 0.191. At a confidence level of 95% holding

herding behavior to a constant zero portfolio returns would stand at 0.184, a unit increase in herding behavior would lead to an increase in portfolio returns by a factor of 0.191 and 0.184 at 95%confidence level.

ANOVA RESULTS

 Table 4.5: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.001	1	.001	2591.735	.001[b]
	Residual	.000	1500	.000		
	Total	.001	1501			

a. Dependent Variable: Port_returns

b. Predictors: (Constant), Standard_dev

The significance value is 0.001 which is less than 0.05 thus the model is statistically significant in predicting how herding behavior influences portfolio returns of the constituents of the NSE 20 Share index. The F critical at 5% level of significance was 0.001. Since F calculated (value = 2591.735) is much greater than the F critical (0.001) this shows that the overall model was significant.

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. A regression model is run to find out the effect of market stress on individual return dispersion.

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

$$CSADt = \alpha + \gamma 1 Rm,t + \gamma_2 Rm,t^{2:}$$

$$CSADt = \alpha + \gamma 1 + 0.000059 + 0.000000003((Rm, t) 2$$

Where the presence of a negative and significant γ_2 indicates existence of herd behavior. The stationarity of CSAD series is checked by unit root tests. The value of γ_2 in equation above is positive which means that returns dispersion is decreasing (or increasing) at an increasing rate. This indicates that herding does not occur in the Nairobi Securities Exchange.

4.4 Discussion of the Research Findings

The study period under review can be described as bullish as a result of the recovery from the global financial meltdown of the 2008-2010. The prices and or returns are generally on an upward trend as foreign investors drive the market to seek superior returns as compared to their domestic market. Foreign investors are dominant in the Kenyan securities trading whereas the domestic or local investors dominate the investor holdings side. Foreign corporate Investor trading volumes account for 69.06% of market activity. Local Corporate investors account for 14.39% of trading in equities whereas local individuals account for only 10.82% (CMA, 2016). The presence of herding can be explained by the foreign investor activity as a result of liquidity challenges. There are very limited investable companies at the Nairobi Securities Exchange thus leading to perceived herding to tradeable companies mostly constituents of the NSE 20 Share Index. Case in point the highest liquidity ratio as of the second quarter of 2016 recorded is

3.41% recorded by Marshalls East Africa which does not have many issued shares. Equity Group holdings are second at a mere 1.63% which explains the tendency to herd in a few companies (CMA, 2016). The local corporate participants that can be speculated to be pension firms and insurance companies can also be contributors of the herding behavior as a result of the lack of a robust market that faces liquidity challenges. Local individuals are mostly influenced by initial public offers where there is the tendency to herd due to perceived opportunity.

Securities prices represent all available information in an efficient market situation. The trading patterns of foreign investors who can be described to a large extent as sophisticated or well informs the result that there exists herding but not to a large extent. The presence of herding in the Kenyan stock market can be explained to some extent by the subscription levels of initial public offers in Kenya case in point Safaricom at 532% that for the longest time distorted the price and prevented price discovery. The immense subscription and interest can be explained by the remarkable performance of prior IPO's such as KENGEN that was also oversubscribed at 333% which sent a signal to the market that attracted a lot of retail investors with irregular trading patterns (CMA, 2016).

This finding contradicts one by Ombai (2010), who in his study investigating herding effect at the NSE during the global financial crisis found evidence of herding among investors at NSE who observed a negatively significant y2 coefficient. Kahuthu (2011) whose study on behavior trading volumes and prices at the NSE Securities Exchange observed that herding instinct among investors have a direct effect on stocks traded and prices. It can therefore be deduced that there is no presence of herding however not to a

great extent. Investors should therefore take note of this condition that contributes to volatility of returns among other factors that affect portfolio returns.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter entails the summary of findings, conclusion and recommendations accompanied by the limitations of the study and suggestions for further research. The findings on whether herding behavior has an impact on the portfolio returns at the Nairobi Securities Exchange are summarized and conclusions together with recommendations are having been given based on these findings.

5.2 Summary of Findings

This study was conducted to investigate the effect of herding behavior on portfolio returns at the NSE. The study was carried out on the portfolio returns of 20 companies which constitute the current NSE 20Share Index for a six-year period running from January 2010 to December 2015. The data was analysed and the regression depicted negative in the case for testing herding.

The R squared which was 0.087 indicated that only 8.7% of changes in the stock returns can be attributed to the volatility or the standard deviation of market returns. The portfolio weighting was done as at 31st December 2015. If herding behavior is held at a constant zero, the portfolio returns would be at 0.191 and 0.184 at a confidence level of 95%. The significance value was 0.001 which was less than 0.05 thus the model was statistically significant in the prediction of the influence that herding has on portfolio returns.

The average portfolio returns was 0.00059 and standard deviation was 0.0008940 for the period between 2010 and 2015. The adjusted R squared was 0.633 indicating that 63.3% variance on portfolio returns was attributed to the changes in the independent variable. The coefficient γ2 was found to be positive using the Chang, Cheng and Khorana (2000) model for testing herding which measures the cross-sectional dispersion in order to detect herding. This depicts that returns dispersions are decreasing at an increasing rate in this case.

5.3 Conclusion

The main purpose of this study was to investigate the effect of herding behavior on the portfolio returns at the NSE. The choice of the Chang, Cheng and Khorana (2000) model for cross-sectional absolute deviation was to enable to capture herd behavior. The coefficient γ2 is deemed to be significantly negative and the relationship as non-linear in the presence of herding. This shows that the return dispersions will decrease (or increase) at a decreasing rate if there is existence of moderate to severe herding.

Investors may end up herding due to the belief that the crowd cannot be wrong in their decision making or engaging in herding for them to avoid losses. Investors mimic these decisions made by others and invest in the same way to avoid the feeling of being left alone. The value of the coefficient γ2 was found to be positive hence indicating no presence of herd behavior. This shows that investors at the NSE are well informed and think rationally when it comes to decision making regarding their choice and preference for investments. Investors' selection of a portfolio should be done in the best way possible in order to maximize the portfolio returns.

The effect of herding may also not be felt in emerging markets because of the rare nature of trading in securities due to such factors like limited capital or little information regarding the securities. This research study has its findings in conformity with other local studies done on herding. It has been revealed that traditional asset pricing models are easier to test as compared to the behavioral models which involve the measure of investors' behavior for both the rational and the influenced ones. It is deduced that investors tend to follow the portfolio's traditional investments practices that yield the optimal portfolio returns.

It can be concluded that herding behavior has no effect on portfolio returns at the Nairobi Securities Exchange. This is inferred by the positivity of the γ2 coefficient which is an indication of the non-existence of the herd behavior at the NSE thereby extending its no impact to the returns of the portfolios formed by investors for trading at the Securities exchange.

5.4 Recommendations

Educating investors will enable them make better decisions with confidence instead of following blindly the actions of others. This will ensure that the investments are widely placed therefore leading to overall participation of investors who are informed. Trainings should be conducted to guide investors on the pros and cons associated with the trading activities at the NSE. This will assist them to embrace their own decisions that they make hence reducing the range of poor investment choices.

The CMA and NSE should put in place policies that enable the minimization of behavioral biases which eventually lead to the overtrading or under trading of securities. The man-

agement of these two institutions should also be in a position to control the information released to the public and tighten the insider information loopholes that may lead to some investors making arbitrage profits while at the same time others report consistent losses which is unfair. The government should also come up with regulations which when put in place, shall be able to protect the trading market.

Researchers and scholars should carry out more studies related to behavioral finance and how it can impact the securities exchange for the purpose of providing an insight and deeper understanding on the biases that can affect the rational thinking of investors together with the solutions to curb the herding menace.

5.5 Limitations of the Study

The process of obtaining data for the study was tedious and costly. The cost of purchase of the data was pegged on the number of years therefore the unavailability of enough funds was an obstacle to the scope of my study therefore the higher the number of years, the higher the cost. The data obtained was in a raw state and required to be arranged in a manner that will be efficient for the analysis of the same.

The time frame for the research was limited. If the time frame was longer, then a more comprehensive study would have resulted thereby enabling more analysis and tests to be done in order to improve on the conclusions. Data mining also consumed a substantial amount of time that would have been allocated to other tasks.

The review of the companies constituted in the NSE 20 Share Index is a frequent process hence hindering the continuous assessment of performance of the companies replaced together with the new entrants. The changes made in the middle of the year make it diffi-

cult for analysis, for example, in October 2010 Kenol Kobil was replaced by East African Cables.

Few local studies have been carried out regarding behavioral finance. Most of the literature found was on developed markets hence making it difficult to compare it with our market for securities. There are even fewer studies carried out on herding locally hence hindering the scope of the study.

5.6 Suggestions for Further Research

This study focused on the portfolio returns at the NSE whereby the portfolio was formed using the 20 blue chip companies constituted in the NSE 20 Share Index. This made an exclusion of the rest of 44 companies listed at the NSE. Further research can be done by forming a portfolio of the total 64 companies listed. This will incorporate the NSE wholly and give a general overview.

Further studies can be done on the effect of herding behavior on the determination of the entry and exit of a company in the NSE 20 Share Index. This research will try to compare the reasons for entry or exit in relation to the herding behavior hence increasing more knowledge on this area of study.

Finally, another area to recommend for further research is the effect of herding behavior on the Initial Public Offerings (IPOs) in Kenya. It would enlighten on whether the IPOs are affected by herding and the extent to which it impacts the capital realized from these IPOs.

REFERENCES

Banerjee, A. (1992). A simple model of herd behavior. *Quarterly Journal of Economics*, 107 (3), 797-818.

Bikhehandani, S., Hirshleifer, D. & Weleh, I. (1992). Learning from the Behavior of Others: Conformity, Fads, and Informational Cascades. *Journal of Economic Perspectives*, 12 (3), 70-151.

Bikhehandani, S., & S., Sharma, (2000). Herd Behavior in Financial Markets: A Review. *IMF Working Paper* 47 (30), 279-310.

Capital Markets Authority. (2016). *CMA Statistical Bulletin.* Nairobi: Capital Markets Authority.

Chang, E., Cheng, J., & A.Khorana, (2000). An Examination of herd behavior in equity Markets: an international perspective. *Journal of Banking and Finance*, 24(10), 1651-1679

Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and investor security market under and overreactions. *Journal of Finance,* 53 (6).

Fama, E. (1965). The Behavior of Stock market prices. *Journal of Business*, 38 (1), 34-105

Fisher, K. L., & Statman, M. (2004). Sentiment, value, and market timing. *Journal of Investing,* 13 (3), 10-21.

Goodfellow, C., Bohl, M. T., & Gebka, B. (2009). Together we invest? Individual and Institutional Investors Trading Behavior in Poland. *International Review of Financial Analysis*, 18(4), 212–221.

Hirshlei'fer, D., Subrahmanyam, A. & Titman, A. (1994). Security Analysis and Trading Patterns When Some Investors Receive Information before Others. *Journal of Finance*, 49 (5), 1665-1689.

Hwang, S., & M., Salmon, (2001). A New Measure of Herding and Empirical Evidence. *A working paper*, Cass Business School, U.K.

Kahneman, D (2011). *Thinking, Fast and Slow* Macmillan Publishers. ISBN 978-14299-
6935-2.

Kahuthu, D.G. (2011). Effects of Herd behavior on trading volume and prices of
securities at the Nairobi Securities Exchange.(*Unpublished MBA research paper*).

Keynes, J.M. (1936). The general theory of employment, interest, and money. London:
Macini1lan.

Kimani, V. W. (2011). A Survey of behavioral factors influencing individual Investors'
choices of securities at the Nairobi Securities Exchange (*Unpublished MBA
research paper*).

Kumba, S. (2011). Market Investing Yet to Ring a Bell to Many.

Lamoureux, C., & W., Lastrapes, (1990). Heteroscedasticity in Stock Return Data:
Volume Versus GARCH Effects. *Journal of Finance*, 45,1990, 221-228.

Linlner, John,(1965) The Valuation of Risk Assets and the Selection of Risky
Investments in Stock Portfolios and Capital Budgets, *Review of Economics and Statistics*, (47), pp. 13-37.

Markowitz, H. (1952). Portfolio selection. *Journal of Finance*, 7, 77-91.

Mwimali H.M (2012). The existence of herd behavior: evidence from the Nairobi
securities exchange (*unpublished MBA research paper*).

Mokua, E. M. (2003). An empirical study on the week-end effect on the stocks at The
Nairobi stock exchange (*Unpublished MBA research paper*).

Mayo, H. B. (2009). Investments: An Introduction 10 edition South-Western College
Publishers, 395-414.

Nairobi Securities Exchange Website 2016: www.nse.co.ke

Nofsinger, J.R. & Sias, R.W. (1999). Herding and feedback trading by institutional and
individual investors. *Journal of Finance,* 54 (6), 2263-2295.

Robert J. Shiller & John Pound (1989). Survey Evidence of Diffusing of Interest Among

Institutional Investors. *Journal of Economic Behavior and Organization*, 12 (1)

47-66.

Roll, Richard; Ross, Stephen (1980). An Empirical Investigation of the Arbitrage Pricing

Theory. *Journal of Finance*, 35 (5): 1073-1103.

Sharpe, W. (1964). Capital Asset Prices: A Theory of market equilibrium under

conditions of risk. *Journal of Finance*, 19, 425-442.

Wermers, R. (1995). Herding, Trade Reversals, and Cascading by Institutional Investors.

University of Colorado, Boulder. World Academy of Science, Engineering and

Technology 54 2009,1197

COMPANIES LISTED IN THE NSE BY SECTOR

Agricultural Sector

Eaagads Ltd

Kapchorua Tea Co ltd

Kakuzi

Limuru Tea

Rea Vipingo Plantations

Sasini Ltd

Williamson Tea Kenya Ltd

Automobiles and Accessories

Car and General (K) Ltd

Sameer Africa Ltd

Marshalls (E.A) Ltd

Banking

Barclays Bank Ltd

CFC Stanbic Holdings Ltd

I&M Holdings Ltd

The Co-operative Bank of Kenya Ltd

Diamond Trust Bank Kenya Ltd

Equity Group Holdings

HF Group Ltd

KCB Group Ltd

National Bank of Kenya Ltd

NIC Bank Ltd

Standard Chartered Bank Ltd

Commercial and Services

Express Ltd

Kenya Airways Ltd

Nation Media Group

Standard Group Ltd

TPS Eastern Africa (Serena) Ltd

Scangroup Ltd

Uchumi Supermarket Ltd

Hutchings Biemer Ltd

Longhorn Publishers Ltd

Atlas Development and Support Services

Construction and Allied

Athi River Mining

Bamburi Cement Ltd

Crown Berger Ltd

E.A Cables Ltd

E.A Portland cement Ltd

Energy and Petroleum

KenGen Ltd

KenolKobil Ltd

Kenya Power and Lighting Ltd

Total Kenya Ltd

Umeme Ltd

Investment

Centum Investment Co Ltd

Olympia Capital Holdings Ltd

Trans-Century Ltd

Home Afrika Ltd

Kurwitu Ventures

Manufacturing and Allied

British American Tobacco Kenya Ltd

B.O.C Kenya Ltd

Carbacid Investments Ltd

East African Breweries Ltd

Eveready East Africa Ltd

Mumias Sugar Co Ltd

Kenya Orchards Ltd

Unga Group Ltd

A.Baumann Co Ltd

Flame Tree Group Holdings Ltd

Telecommunications and Technology

Safaricom Ltd

Real Estate Investment Trust

Stanlib Fahari I-REIT

Investment Services

Nairobi Securities Exchange Ltd

	Weighting	Weights
Sasini	19.55	0.97%
KQ	4.9	0.24%
NMG	191	9.46%
SCAN	30	1.49%
ICDC	46.5	2.30%
KCB	44	2.18%
COOP	18.05	0.89%
SCBK	195	9.66%
BBK	13.6	0.67%
EQTY	40	1.98%
CFC	82.5	4.09%
EABL	273	13.52%
BAT	785	38.88%
ARM	41.75	2.07%
BAMB	175	8.67%
KENO	9.6	0.48%
KPLC	13.2	0.65%
KEGN	7.1	0.35%
SCOM	16.5	0.82%
BRIT	13.00	0.64%
Total		

	2,019	

APPENDIX 3

	Average Returns	Standard Deviation
Sasini	0.02%	0.71%

KQ	0.10%	2.48%
NMG	-0.12%	2.11%
SCAN	0.04%	1.55%
ICDC	0.04%	2.60%
KCB	0.12%	2.38%
COOP	0.06%	1.49%
SCBK	0.06%	1.51%
BBK	0.03%	1.49%
EQTY	-0.03%	2.40%
CFC	0.09%	1.87%
EABL	0.06%	2.34%
BAT	0.05%	1.41%
ARM	0.12%	2.11%
BAMB	0.21%	10.55%
KENO	0.02%	1.74%
KPLC	0.00%	3.07%
KEGN	-0.06%	2.76%
SCOM	-0.02%	2.09%
BRIT	0.10%	1.59%

APPENDIX 4

Sasini	0.97%
KQ	0.24%
NMG	9.46%
SCAN	1.49%
ICDC	2.30%
KCB	2.18%
COOP	0.89%
SCBK	9.66%

BBK	0.67%
EQTY	1.98%
CFC	4.09%
EABL	13.52%
BAT	38.88%
ARM	2.07%
BAMB	8.67%
KENO	0.48%
KPLC	0.65%
KEGN	0.35%
SCOM	0.82%
BRIT	0.64%