

**THE EXISTENCE OF HERD BEHAVIOUR: EVIDENCE FROM
THE NAIROBI SECURITIES EXCHANGE**

BY

MWIMALI HALIMA MALOBA

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DECLARATION

This project is my original work and has not been presented for any research project for the award of any degree in any university.

Signature: ..*^.....Date: ...!.*(•' { *?! 5.

MWIMALI HALIMA MALOBA

D61/60603/2011

This research has been submitted for examination with my approval as University supervisor.

Signature:

Date:.

Otieno Odhiambo Luther

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DEDICATION

To my daughter Cindy, you are the greatest gift on earth, without you, I would not have come this far. God bless you.

ABSTRACT

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 rationally make 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 which reveal no presence of herding behavior among investors at the NSE. In conclusion there is evidence which supports the predictions of rational asset pricing models and suggests that herding is not an important factor in determining equity returns during periods of price fluctuations in the market

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List of Abbreviations

EMH	Efficient Market Hypothesis
NSE	Nairobi Securities Exchange
APT	Arbitrage Pricing Theory
CAPM	Capital Asset pricing Theory
TV	Television
US	United States
UK	United Kingdom
CSAD	Cross-sectional Absolute Standard Deviation
PCM	Portfolio Change Measure
MKT	Market
CSSD	Cross-Sectional Standard Deviations
AVD	Absolute Value of the Deviation
MIN	minimum
MAX	maximum

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Herding behavior describes how individuals in a group can act together frantically. It pertains to the behavior of animals in the herds, flocks and to human conduct during activities such as stock bubbles and crashes, street demonstrations, sporting events, religious gatherings, episodes of mob violence and every day decision making, judgment and opinion forming. Herding in financial markets is a behavioral tendency for an investor tends to follow the actions of others.

Bikchandarni, Hirchleifer and Welch (1992) postulates that practitioners are interested in whether herding exists, because the reliance on collective information rather than private information may cause prices to deviate from fundamental value and present profitable trading opportunities. They also say that herding has attracted the attention of academic researchers, because the associated behavioral effects on stock price movements may affect their risk, return characteristics, and thus have implications for asset pricing models. A study done in Tehran Exchange by Moradi and Abbasi (2012) presuppose that since industries efflorescence, creation of occupation and going out of crises and economic undesired situations require provision of desired conditions to invest in share markets, so recognizing and detecting present inadequacies and solving existent problems in order to avoid such downfall which threatens shares market is essential and necessitous.

There are two basic assumptions in finance and specifically with regard to asset valuation, that investors are logical and efficient market hypothesis (EMH) holds.

Professor Eugene Fama (1965) developed the efficient-market hypothesis; explaining that financial asset prices reflect available information. Beyond the normal utility maximizing agents, the efficient-market hypothesis requires that agents have a rational expectation, that on average the population is correct (even if no one person is), and whenever new relevant information appears, the agents update their expectations appropriately. Note that it is not required that the agents be rational. EMH allows that when faced with new information, some investors may overreact and some may under react. All that is required by the EMH is that investors' reactions be random and follow a normal distribution pattern so that the net effect on market prices cannot be reliably exploited to make an abnormal profit, especially when considering transaction costs (including commissions and spreads). Thus, any one person can be wrong about the market indeed*, everyone can be but the market as a whole is always right. Investors and researchers have disputed the efficient-market hypothesis both empirically and theoretically. However realization of higher yields from small firms compared to large firms; return differential between high and low P/E contradict EMH. These have forced researchers to look at competing models (GolArzi, 2010).

Behavioral economists attribute the imperfections in financial markets to a combination of cognitive biases such as overconfidence, overreaction, representative bias, information bias, and various other predictable human errors in reasoning and information processing. Research by psychologists such as Daniel Kahneman and Amos Tversky (1979), Richard Thaler,(1980) all agree to the fact that these errors in reasoning lead most investors to avoid value stocks and buy growth stocks at expensive prices, which allow those who reason correctly to profit from bargains in neglected value stocks and the overreacted

selling of growth stocks. According to Olsen, (1998) behavioral finance considers how various psychological trails affect individuals groups who act as investors while recognizing that though the standard financial model of rational behavior and profit maximization can be true within specific boundaries such models does not consider individual behavior. He also explains that some financial phenomena can be better-explained using models that take into account investor irrationality and absence of arbitrage opportunity.

1.1.1 The Concept of Herding Behavior

Herding arises when investors decide to imitate the observed decisions of others in the market rather than follow their own beliefs and information. Such behavior is individually rational on a number of grounds although it may not necessarily lead to efficient market outcomes. Herding can be rational in a utility maximizing sense, for instance, if the other participants in the market are informed or if deviating from the consensus is potentially costly as, for example, in the remuneration of fund managers. A study done by Banerjee (1992) reveals that the suppression of private information can lead to "information cascades" in which the market price reflects less and less new information as new members of the herd are recruited. Such a process moves the market towards inefficiency. This form of correlated behavior can be in principle separated from a "spurious" or unintentional herding where independent individuals decide to take similar actions induced by the movement of fundamentals (Bikhchandani and Sharma, 2000).

However whether herding is rational or irrational it is clearly important to be able to discriminate empirically between these two cases of common or correlated movements in the market; one of which potentially leads to market inefficiency whereas the other simply reflects an efficient reallocation of assets on the basis of common fundamental news. Since both motivations represent collective movements in the market towards some position or view and hence some class of assets it has not been easy to develop statistical methods that discriminate between these two cases.

1.1.2 Herding and Asset Valuation

Popular explanation for the variability of equity returns attributes price changes to the influence of investor herds, which many observers perceive as forming spontaneously and behaving irrationally, in an asset-pricing context Christie and Huang (1995). The credence that herd behavior reflects the irrational response of investors rather than the outcome of rational decision making is of particular concern because it implies that prices are driven away from their equilibrium values. Under this premise, investors are exposed to the unpredictable whims of herds and may be forced to transact at inefficient prices. Another explanation is that the view that herding arises when financial markets are in stress may be simply wrong. When a market is in stress, large negative returns may be observed and the majority of the individual assets will also show negative returns and this tends to conclude that there is herding in the whole market (Hwang and Salmon, 2001)

However, the dispersion of returns (cross-sectional variance of returns) is likely to be much larger during period of market stress than during quiet period Christie (1982). Therefore, even though the majority of assets show negative returns during market stress,

the returns are more widely dispersed and hence herding may not in fact be present in such a period. Predictions concerning the behavior of dispersions during periods of market stress also emerge from rational asset pricing models. These models typically relate individual returns to some common factor(s), of which the market return is the most prominent observable factor. During periods of market stress, rational asset pricing models predict that large changes in the market return would translate into an increase in dispersion, because individual assets differ in their sensitivity to the market return. Herd behavior and rational asset pricing models offer conflicting predictions for the behavior of dispersions; herd behavior presupposes that dispersion in factor sensitivities will repel individual returns away from the market whereas rational asset pricing models ascertain that individual returns relate to some common factor which is market return.

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Empirical evidence shows that dispersions increase significantly during periods of large absolute price changes. These results, which are consistent with the predictions of rational asset pricing, are detected using both daily and monthly returns and are present for both positive and negative movements in average prices. This failure to detect herd behavior may reflect the tendency of herds to form around indicators other than the average consensus of all market participants, rather, individuals may rely on other cues and herd around the returns of firms that share common characteristics. Christie and Huang (1995) believe that if individual security returns herd around their industry average during periods of market stress, a significant reduction in dispersions within industries should be observed.

1.1.3 Nairobi Securities Exchange Market Players

The Kenyan market provides an interesting setting for the analysis of investor herding behavior. A study done in Kenya Kumba (2011) reveals that only 19 percent of the adult population in Kenya invests in shares. This is in spite of the sharp increase in the number of companies floating shares at the Nairobi Stock Exchange in the past few years. This contradicts the interest that stocks have raised among Kenyans, especially with the recent initial public offerings (IPOs) of state companies like KenGen, KenyaRe, and Safaricom. These were oversubscribed, indicating a healthy interest in the stock market. A survey done by, Synovate (2009) has cited lack of funds and, most important, knowledge about the workings of the stock market as the two major hurdles to participation at the bourse. Most Kenyans (81 per cent) do not invest in the NSE, with most people citing lack of money (61 per cent) or lack of knowledge about how the stock market works (40 per cent) as the reasons that keep them away from the bourse. These findings were consistent across all the counties, as well as gender and age. (Yenkey, 2012).

The Nairobi securities Exchange is a market commonly known as the NSE. It is the largest stock exchange in East and Central Africa by number of companies listed and the value of shares. NSE consists of nineteen member firms at the Nairobi Securities Exchange which act as stock brokers or investment banks. The NSE is constituted by 60 quoted and listed companies which offer shares classified as ordinary. They are spread across various sectors of the economy as follows: 7 in Agricultural sector, 9 in Commercial and service sector, 2 in Telecommunication and technology, 4 in Automobile

and Accessories, 10 in Banking, 6 in Insurance, 4 in investment, 9 in manufacturing, 4 in Energy and Petroleum and 5 in construction and Allied .(w.w.w.nse.co.ke).

1.2 Statement of the Problem

The problem that faces most investors is dealing with uncertainty. Arrow (1963) and Debreu (1959) contribution was fundamental in showing how the economic model under certainty could be adopted to incorporate uncertainty. William Sharpe (1964) in search of* asset valuation model and relying on earlier work of Markowitz disaggregated total risk into diversifiable and un-diversifiable risk, concluding that in efficient markets investors are only compensated for the risk that they cannot avoid Lintner (1965) came up with a model close to Sharpe (1964). Roll and Ross (1980) APT model was a critique of William Sharpe's (1964) model is general theory of asset valuation that holds that the expected return of a financial asset can be modeled as a linear function of various macro-economic factors or theoretical market indices, where sensitivity to changes in each factor is represented by a factor-specific beta coefficient. Yet a number of investors behave as if asset valuation models do not exist. Instead, investors tend to be imitators, a kind of herding behavior.

Information asymmetry in capital markets could explain the existence of herding behavior Banerjee, 1992; Bikhchandani, Hirshleifer, and Welch, 1992, 1998). Herding, refers to the cases where investors make the same or similar risk-taking, asset investment decisions. Herding can occur either when investors are sharing the same information or facing similar circumstances; rationally make 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 (Johnsson, Lindblom, & Platan, 2003). Investor tends to rely on advice of investment managers. This creates agency problem. The agency problem and the performance-based reward structure that limits responsibility in the case of collective, as opposed to individual failure of investment managers, can lead to herding behavior (Scharfstein and Stein, 1990). There are problems associated with herding. These include deterioration of investment standards, misallocation of scarce resources, asset price bubbles, increased systemic risks, and aggravation of the business cycle. It is therefore necessary assessing the existence of herding in a market such as NSE.

Nairobi Securities Exchange is an emerging market which possesses a short history compared with developed countries, and also is in the stalling point of its development and efflorescence, studying the existing problems in this market prohibits the occurrence of problems which have been made in the developed countries' shares markets having more precedence. Few studies have been done on herding behavior at the NSE. Karungaru (2006) noted that herd instincts play an important role in her study of empirical relationship between trading volume and returns volatility. Similar Study by Kahuthu (2011) studied the effects of herd behavior on trading volume and prices of securities at the NSE and he shows that herd behavior has a positive correlation with trade volume and prices of securities quoted at the stock exchange, thus public mood (whether induced or otherwise) makes people trade in financial assets without rationality. To bridge the gap this study focused on the price implications of herding by investigating whether equity returns reveal the presence of herd behavior. This study therefore sought

an answer to the questions: Does herding behavior among individual investors exist at the NSE? What is the effect of the herding behavior at the NSE?

1.3 Objective of the study

To investigate the existence of herding behavior among the investors at the NSE

1.4 Value of the study

The findings of this study will benefit a number of interested parties as follows: It will assist the investors to make investment decisions. Investors will be aware of what herding behavior is and what drives them to herd. It is important for investors to know that although being part of group (herd) strengthens belonging, it nevertheless important to make decisions based on the information that the investors has.

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This research may be effective in reforming officials' decisions to accurate orientation of shares market. On the other hand, macro policy of a country comes with privatization and reducing government's charges and it is expected from the main volume of investments transferring to the shares market, thus its present weaknesses must be removed to encourage the investors to engage in this sector to invest. Therefore, the right realization of existing weaknesses in the market may plat reforming treatments in the market.

Lastly, this study will provide academicians with a basis for further studies of behavioral finance. It will contribute to the general body of knowledge and form a basis for further research on ways of utilizing the financial sector to grow economically.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to provide the readers insight about the theory and scholarly work done in the same field of herd. This chapter contains a review of the herd n behavior, causes of herd behavior among the investors, the measure of herd behavior, herd behavior during periods of market stress and empirical studies on the study of herd behavior

2.2 Theories of Herding

The theories of herding, one of which was the basic models in Scharfstein and Stein (1990), Bikhchandani, Hirshleifer and Welch (1992), Banerjee (1992), Zwiebel (1995), and Prendergast and Stole (1996) assume that individual is a communicator, i.e. the individual issues and receives informative signals and that the transmission of information between individuals takes different shapes. Hirshleifer, (1995). Individuals can observe either all information held by others, either as the result of their private calculations, or solely the actions achieved by another previously confronted by the same choice. The individual tends to herd if he bases exclusively on the positions taken by others. First, herding is usually defined in terms of crowd behavior - that is, a group is defined as a herd if members of that group tend to move more strongly with each other than with the collective movement of other groups. Second, herding can be based on fundamentals or herding can be faddish. In the former case, imperfectly rational agents deduce information from the behavior of other agents in the herd perhaps because of the

additional cost of obtaining or verifying information from outside the herd. Herding can be based on fads if agents behave irrationally and limits to arbitrage prevent prices from rapidly converging to fundamental values. Even rational informed agents may decide to ride the fad when fundamental information and or arbitrage are costly.

2.2.1 Herding as a Rational Behavior

Most of the theoretical finance literature focuses on rational herding. Bikchandani and sharma (2000) classifies rational herding further into three subcategories: informational-based herding, reputation-based herding, and compensation-based herding. One of the first informational-based herding models was built by Benerjee (1992 he analyzes a sequential decision-making model in which each decision-maker takes into account the decisions made by the previous investors before taking her own decision. He finds a unique Nash equilibrium that is characterized by fairly extensive herding. In various circumstances, depending on the decisions of the first few agents, a decision-maker located later in the sequence rejects her private information and decides to mimic others' actions. In this case, the decision maker joins a so-called informational cascade, in which accumulation of information stops altogether.

2.2.2 Herding as an Irrational Behavior

Large stock market trends often begin and end with periods of frenzied buying (bubbles) or selling (crashes). Many observers cite these episodes as clear examples of herding behavior that is irrational and driven by emotion greed in the bubbles, fear in the crashes. Individual investors join the crowd of others in a rush to get in or out of the market. Brunnenneier (2001). According to Prechter (1999), some followers of the technical



analysis school of investing see the herding behavior of investors as an example of extreme market sentiment. The academic study of behavioral finance has identified herding in the collective irrationality of investors, particularly the work of Robert Shiller (2000). Bikhchandani, Hirshleifer and Welch (1992), showed that herd behavior may result from private information not publicly shared. More specifically, they showed that individuals, acting sequentially on the basis of private information and public knowledge about the behavior of others, may end up choosing the socially undesirable option.

2.2.3 Reasons for Emergence of Herding Behavior

Bickchandani, Hirshleifer, & Welch (1992) suggest that the main reason of emergence and formation of herding behavior in the shares market is due to the informational cascades. In their opinion, the observation of others' behavior transfers information to the individual and thus those who lack necessary information or do not believe in their own individual information begin to imitate and follow them by supposing that others' analysis and information is more accurate and complete than their own information. By performing separate investigations, Froot, Scharfstein, & Stein (1992) and Hirshleifer, Subrahmanyam, & Titman (1994) came to the conclusion that the cause of investors' herding behavior in the shares market is their utilization of common information sources. They claim that investors have access to common information sources and by them, analyze in a standard way, which results in making similar decisions in the market. Unlike other researchers, they consider the same and monotonous analyzers and investors behaviors in the shares market as a desired phenomenon which indicates information clearness or information efficiency. Scharefstein and Stein (1990) ascribe that the

concern and fear of losing reputation and credit by doing individual movements and being separate from the group are the main causes of investors' herding behaviors in the shares market. In their opinion, the investors who aren't sure of their abilities in analyzing information and making right decisions prefer to follow more experienced investors and analysts' decisions as a result of their fear of losing their credit and reputation.

Another reason which attributes herding behavior is the psychological structure of individuals in accordance with the society Dechow and Welch (1996). The viewpoint is that there are individuals in the market who possess secret information and make decisions by considering this information and other investors, therefore, would gain higher yield through following them Bikchandani et al (1992). As regards agency relations as the factor of out-breaking of herding behavior and suggesting that managers reduce their intended risk by following others due to employment reasons, gaining reputation and maintaining well reputation. By examining and surveying the relationship between the outbreak of herding behavior and well reputation rate, Villatoro (1990) suggests the more managers have concern on reputation, the more they rely on their individual information and conversely, the less known managers divulge more herding behavior from themselves.

2.3 I lie Measure of Herding Behavior

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

bounded from below at zero when all returns move in perfect unison with the market, as individual returns begin to vary from the market return, the level of dispersion increases. Because individuals are more likely to suppress their own beliefs in favor of the market consensus during periods of unusual market movements herd behavior would most likely emerge during periods of market stress, a natural candidate for these periods are those trading intervals characterized by large swings in average prices. Because the presence of herds implies that investors are willing to suppress their own beliefs in favor of the market consensus, security returns will be swept along with the market.

To test the proposition of the presence of herd the behavior on the part of investors during periods of market stress the cross-sectional standard deviation of returns developed by Christie and Huang (1995), or dispersion, is used to capture herd behavior. When individual returns herd around the market consensus, dispersions are predicted to be relatively low. In contrast, rational asset pricing models predict an increase in dispersion because individual returns are repelled away from the market return when stocks differ in their sensitivity to market movements. During extreme down markets, when herding is expected to be most prevalent, the magnitude of the increase in the dispersion of actual returns is mirrored by the increase in the dispersion of predicted returns that are estimated from a rational asset pricing model

2.4 Nerd Behavior during Market Stress

During periods of abnormally large average price movements, or market stress, the differential predictions of rational asset pricing models and herd behavior are most pronounced. Specifically, because Individual securities differ in their sensitivity to the

market return, rational asset pricing models predict that periods of market stress induce increased levels of dispersion. In contrast, the herding of individual returns around the market translates into a reduced level of dispersion. In Christie and Huang (1995), the cross-sectional standard deviation of individual stock returns is calculated and then regressed on a constant and two dummy variables designed to capture extreme positive and negative market returns. They argue that during market stress rational asset pricing would imply positive coefficients on these dummy variables, whilst herd behavior would suggest negative coefficients.

According to Hwang and salmon (2001), market stress does not necessary imply that the market as a whole should show either large negative or positive returns. For example, periods of large swings have been seen in both the Dow Jones and the NASDAQ (or the old and new economics) whilst the market for stocks as a whole has not shown any dramatic change in the aggregate. In this case, without any large movement in the whole market there may still observe considerable reallocation towards particular, sectors. Thus, determining herding as only arising when there are large positive or negative returns will exclude these important examples of herd behavior and regressing the cross-sectional volatility of returns on the two dummy variables will result in misleading conclusions.

2.5 Defining Equity Return Dispersions

Equity returns, r , is measured by the following expression:

$$P_i - P_c$$

$$P_c$$

Where P_0 is the observed price of security of a firm at the beginning of the month, P_1 is the price at the end of the month. By quantifying the degree to which asset returns tend to rise and fall in concert with the portfolio return, this measure captures the key attribute of herd behavior. Dispersions are obtained using the equation of standard deviation from the mean of the market portfolio. They are predicted to be low when herd behavior is present, but low dispersions by themselves do not in turn guarantee the presence of herding. For example, the lack of new information during a trading interval would generate low dispersion, even in the complete absence of herd formation. Therefore, we cannot search for periods of low dispersions ex post and attribute them to the influence of herds. Equity return dispersions bear a resemblance to standard measures of volatility but differ in that expression uses the portfolio return in place of the expected return of the individual assets. (Scharfstein and Stein, 1990)

For dispersions to correspond more closely to the volatility of a portfolio, the portfolio return should be replaced with the expected return for each of the individual securities. For example, we could set the expected return of each security to zero in considering short time intervals such as daily returns. The measure then collapses to the average volatility of the individual assets in the portfolio at a point in time, but it still differs from the volatility of the portfolio

2.6 Empirical studies done oil herd behavior

Herding is defined in a more general sense of clustered trading. Specific forms of systematic trading patterns deriving from past returns, capital gain and loss position, and attention can also be interpreted as herding. However, when it comes to drawing

conclusions on asset pricing, it is the overall clustering that is the primary concern. The empirical support for herd behavior is mixed. Shiller and Pound (1989) provided survey evidence on herding among institutional investors. They found that institutional investors place significant weight on the advice of other professionals on their buy and sell decisions in volatile stocks. Another recent empirical study found only weak evidence of herding decisions by institutional investors among small stocks and no evidence of herding among large stocks. The experimental evidence in social psychology on the behavior of individuals in groups suggests that individuals abide by the group decision, even when they perceive the group to be wrong. In a market setting, herds are characterized by individuals who suppress their own beliefs and base their investment decisions solely on the collective actions of the market, even when they disagree with its predictions. Thus, herd formation suggests that investors are drawn to the consensus of the market, implying that individual returns would not stray far from the market return.

Various empirical measures have been proposed to detect herding. The most widely used herding measure is that invented by Lamoreux and Lastrapes (1990). LSV measure seeks to detect whether more investors are trading on either the buy or sell side of the market than would be expected if investors traded independently. They used the investment behavior of 769 U.S tax-exempt equity funds managed by 341 different money managers to empirically test for herd behavior and concluded that money managers in their sample do not exhibit significant herding. There is some evidence of such behavior being relatively more prevalent in stocks of small companies compared to those of large company stocks. Their explanation is that there is less public information on small stocks and hence money managers pay relatively greater attention to the actions of other players

in making their own investment decisions regarding small stocks. Grinbaltetal (1995) used the quarterly ownership data on portfolio changes of 274 mutual funds between 1974 and 1984. Relating it to momentum trading, find more herding by investors in buying past winners than investors selling past losers. To control for significant heterogeneity in the mutual funds, they differentiate funds according to their investment objectives: aggressive growth funds, balanced funds, growth funds, growth-income funds, income funds. They find even less herding after controlling for objectives.

Wermers (1995) developed a new measure of herding that captures both the direction and intensity of trading by investors. Intuitively, herding is measured by the extent to which portfolio weights assigned to the various stocks by different money managers move in the same direction. The intensity of beliefs is captured by the percent change of the fraction accounted for by a stock in a fund portfolio. Christie and Huang (1995) examined the investment behavior of market participants in the U.S. equity markets. They argued that, when herding occurs, individual investors usually suppress their own information and valuations, resulting in a more uniform change in security returns. Chang etal (2000) uses the cross-sectional absolute standard deviation (hereafter CSAD) of returns as a measure of dispersion to detect the existence of herding in the U.S., Hong Kong, Japanese, South Korean and Taiwanese markets. They examine individual returns on a monthly basis and find a significant non-linear relationship between equity return dispersion and the underlying market price movement of the South Korean and Taiwanese markets, providing evidence of herding within these emerging markets.

Hwang and Salmon (2006) developed a new measure (hereafter HS) in their study of the US and South Korean markets. This model is price-based and measures herding on the basis of the cross-sectional dispersion of the factor sensitivity of assets. More specifically, they argued that when investors are behaviorally biased, their perceptions of the risk-return relationship of assets may be distorted. If they do indeed herd towards the market consensus, then it is possible that as individual asset returns follow the direction of the market, so CAPM-betas will deviate from their equilibrium values. Keynes (1936) notes that stock returns and herding are likely to be affected by fundamentals, at the level of the market or the individual firm.

Among the studies done at the NSE Karungaru (2006) noted that herd instincts play an important role in her study of empirical relationship between trading volume and returns volatility, she noted that volatility was partially caused by market sentiments (irrational public behavior common in herd behavior concept) which can be prevalent in one region or across regions. Cherutoi (2006) in her study on the existence of the reverse weekend effect at the NSE noted the role played by colleagues and other investors in influencing investment decisions. Werah (2006) noted that irrationality and behavior witnessed in (2006) at the NSE when investors liquidated other securities with the hope of purchasing at the Kenyan IPO which resulted in mass deposit funds and unutilized of idle money. Recent study done by Kahuthu (2011) on effect of herd behavior on trading volume and prices of securities at the NSE shows that herd behavior has a positive correlation with trade volume and prices of securities quoted at the stock exchange, thus if public mood (whether induced or otherwise) makes people trade in financial assets without rationality.

2.7 Conclusion

There are problems associated with herding. These include deterioration of investment standards, misallocation of scarce resources, asset price bubbles, increased systemic risks, and aggravation of the business cycle. It is therefore necessary assessing the existence of herding in a market such as the NSE. Studies done at the NSE shows existence of herd behavior but no study has been done on the price implications of herding by investigating whether equity returns reveal the presence of herd behavior. The finding of this research will hopefully add to the available literature of herd behavior.

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CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter systematically provides an explanation of the research design that was adopted by this research, the target population, the data sample, data collection method and techniques that will be used to analyze data.

3.2 Research design

In this study, an empirical design was used to determine the relationships on variables. Due to the nature of the data that was be collected, a quantitative approach was used where stock prices were collected and analysed. The main purpose of the design is to determine the reason of the phenomenon under study. The chosen design was effective / since the study wanted to establish price implications of herding by investigating whether equity returns reveal the presence of herd behavior

3.3 Target population

The population of interest of this study was composed of all the 60 companies currently listed at the Nairobi Securities Exchange.

3.4 Sample Design

The sample used is the securities that constitute NSE 20 share index. This sample was chosen because the market index is representative of the whole market such that any changes in the securities will reflect changes in the whole market. The NSE share index is constituted by 20 companies ([w.w.w.nse.co.ke](http://www.nse.co.ke)).

3.5 Data Collection

The data for this study was collected from the Nairobi Securities Exchange. Secondary data for the NSE share index for a 16 year period from April 1996 to June 2012 was used.

The average weekly data was used this is because using high frequency data such as daily observations can result in the use of very noisy data thus yield inefficient results. The most striking difference between the results for daily and weekly data is that the magnitude of the dispersion measure is considerably higher for the weekly data. This difference reflects the fact that, with weekly data, individual returns have a greater opportunity to stray slightly farther from the mean.

3.6 Data Analysis

A model developed by Christie and Huang (1995) popularly known as (CII) was used in the analysis of the data in this study. Although the cross-sectional standard deviation of returns is an intuitive measure for capturing herding, it can be considerably affected by the existence of outliers. One of the challenges associated with the approach described above is that it requires the definition of extreme returns. CH note that this definition is arbitrary, and they use values of one percent and five percent as the cutoff points to identify the upper and lower tails of the return distribution. In practice, investors may differ in their opinion as to what constitutes an extreme return, and the characteristics of the return distribution may change over time. In addition, herding behavior may occur to some extent over the entire return distribution, but become more pronounced during periods of market stress, and the CH method captures herding only during periods of extreme returns. Additional challenges arise when applying this method the NSE market

data because the relatively short history of these markets makes it difficult for investors to identify when extreme returns occur.

To measure the potential influence of herding on prices, first I considered how herd behavior may manifest itself in return data. Weekly returns from the NSE were obtained from the securities prices from January 1996 to December 2012. The weekly return of an individual security was computed using

$$P1 - P0$$

(Equation 1)

Where, P_1 is the price at the beginning of the week whereas P_0 is the price at the end of the week. Under the traditional definition of herd behavior, an intuitive measure of its market impact is dispersion; defined as the cross-sectional standard deviation of returns (CSSD) Dispersions quantify the average proximity of individual returns to the mean. They are bounded from below at zero when all returns move in perfect unison with the market, as individual returns begin to vary from the market return, the level of dispersion increases. Portfolio returns were equally weighted, and dispersions calculated using Equation of standard deviation.

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^n (r_i - \bar{r})^2}{n-1}} \quad \text{(Equation 2)}$$

Where r_i is the observed return on firm i and r is the cross-sectional average of the n returns in the portfolio. By quantifying the degree to which asset returns tend to rise and fall in concert with the portfolio return, this measure captures the key attribute of herd behavior

Individual securities differ in their sensitivity to the market return, rational asset pricing models predict that periods of market stress induce increased levels of dispersion. In contrast, the herding of individual returns around the market translates into a reduced level of dispersion. To differentiate between the two hypotheses, the level of dispersion, (a) in the extreme tails of the distribution of market returns was tested whether it differs significantly from the average levels of dispersion that exclude the outermost market returns. The regression used values of one percent and five percent as the cutoff points to / identify the upper and lower tails of the return distribution. These tests were performed using the following regression

$$CSSDI = a + p_1 D_t^L + p_2 D_t^U + e_t \quad (\text{Equation 3})$$

Where S_t is the return dispersion at time t . D_t^L is a dummy variable at time t taking on the value 1 when the market return at time t lies in the extreme lower tail of the distribution, and 0 otherwise. Similarly, D_t^U is a dummy variable with a value of 1 when the market return at time t lies in the extreme upper tail of the distribution, and 0 otherwise. a coefficient denotes the average dispersion of the sample excluding the regions covered by the two dummy variables. This model suggests that if herding occurs, investors will make similar decisions, leading to lower return dispersions. Thus,

statistically significant values for $(V$ and $[V$ in equation would indicate the presence of herding

Rational asset pricing models predict significantly positive coefficients for $[3$ and $[32$, and negative estimates of $(31$ and $[32$ will be inconsistent with the presence of herd behavior.

All the results will be represented in form of tables to show comparison from one period to the other.

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CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

Daily stock price data for the entire population at the Nairobi Securities Exchange and the equally-weighted market index along with year-end market capitalizations for each firm was obtained. Daily stock price for all shares listed used were to derive weekly prices from April 1996 to June 2012. From which weekly returns are computed.

4.1 Descriptive statistics for the entire periods sampled

The mean market return and the CSSDt for the period were computed using Equation 1 and 2 respectively and the results obtained were tabulated.

4.1.1 Descriptive statistics for the sample period 1996-1997

The report gives the statistics for weekly mean return returns for the NSE market. The data availability period range from April 1996 to December 1997 and has total of 91 weeks. The mean market return for the entire period is 0.305 as shown in Table 4.1.

Table 4.1 also gives the statistics on the CSSD measure. By definition, when all returns move in perfect unison with the market the CSSDs are bounded from below by Zero. As individual returns begin to deviate from market return the level of CSSD increases. Equity market returns during this period are characterized by higher magnitudes of volatility with standard deviation, the average CSSD for the period is 5.105.

The weekly CSSD of the sample ranges from a low of 1.064 to a high of 18.017. The average weekly market return ranges from a low of -2.944 to a high of 14.995 this is shown in Table 4.2.

Variable	N	Mean	Median	TrMean	StDev	SE
McanMktReturn	91	0.305	0.234	0.162	2.060	0.216
CSSDt	91	5.105	4.691	4.794	2.727	0.286

Table 4.1

Variable	Minimum	Maximum	Q1	Q3
Mk Return	-2.994	14.995	-0.865	0.933
CSSDt	1.064	18.017	3.351	5.641

Table 4.2

Graphical representation of weekly market return and CSSD for the period of 1996-1997 /
are shown in Figure 4.1 and 4.2 respectively



Figure 4.1

Weekly CSSD 1996 to 1997

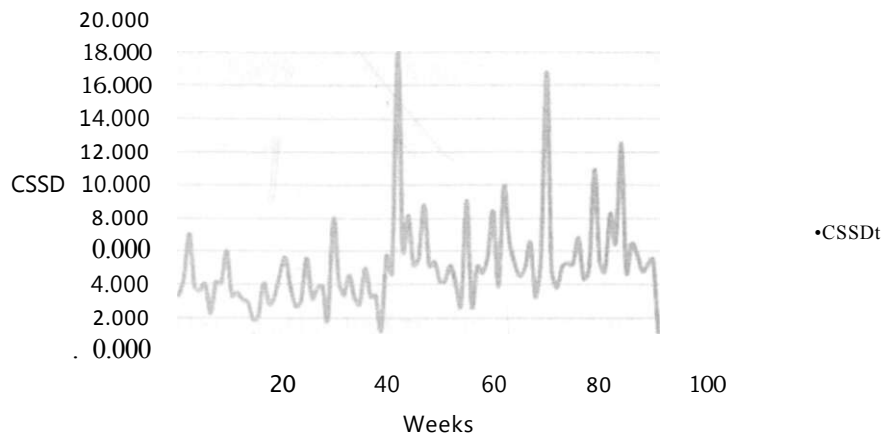


Figure 4.2

4.1.2 Descriptive Statistics: Mkt Return, CSSDt for the sample period 1998-2001

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The weekly return was computed from the prices of individual securities using Equation 1. The weekly returns were equally weighted for the entire period for a total of 208 weeks. The mean market return for this period was -0.111 and the average CSSDt of the entire period was 3.988.

Variable	N	Mean	Median	TrMean	StDev	S'E Mean
Mk Return	208	-0.111	-0.358	-0.188	1.551	0.108
CSSDt	208	3.988	2.726	3.345	5.005	0.347

Table 4.3

The market return for the period of 1998-2001 ranges from the low of -3.695 to the high of 6.667. The CSSDt showed great variability having a minimum of 0.000 with a

maximum of 40.161

variable	Minimum	Maximum	Q1	Q3
Mk Return	-3.695	6.667	-0.943	0.522
CSSDt	0.000	40.161	0.530	5.614

table 4.4

4.1.3 Descriptive statistics for the period of 2003-2012

The CSSDt of the sample period 2003-2012 was high as compared to the earlier periods done. The average CSSDt was 45.776 and the average market mean 0.498. The period had a minimum CSSDt of 44.617 and a high of 48.005 and the average market mean had a low of -10.163 and a high of 17.520

Variable	N	Mean	Median	TrMean	StDev	SE Mean
CSSDt	498	45.776	45.771	45.769	0.560	0.025
Market Re	498	0.498	0.297	0.381	3.042	0.136

Variable	Minimum	Maximum	Q1	Q3
CSSDt	44.617	48.005	45.291	46.199
MarketRe	-10.163	17.520	-1.059	1.749

Table 4.5

4.2 Descriptive Statistics: Market Return, CSSDt by Up and down

To allow for the possibility that the degree of herding may be asymmetric the up-versus the down-market, a run following an empirical specification: where $CSSDt$ is the average $AVDt$ of each stock relative to the return of the equally-weighted market portfolio, absolute value of an equally-weighted realized return of all available securities on day t when the market is up (down). Both variables are computed on a weekly basis

4.2.1 Descriptive statistics: market return, CSSDt by up

Descriptive statistics on the market return were obtained based on the market return and $CSSDt$ when the market return lies in the extreme upper tail. Dummy variables were used depending on the quartile the observations falls, it was 1 if the value of the market return at time t lied in the extreme upper tail of the distribution, and 0 otherwise

4.2.1.1 Descriptive Statistics: Market Return, CSSDt by Up for the sample of 1996-1997

The number of observations which were in the extreme upper tail were 22 out of the total 91 observation, this was done after all the observations were grouped into four Quartiles from 1-4 then dummy variables based on market return at time and the quartile where that observation falls. The mean and the $CSSDt$ are shown in the tabic 4.6 and the minimum and the maximum values are shown in table 4.7

Variable	Up	N	Mean	Median	Tr Mean	StDev
Mk Return	0	69	-0.386	-0.023	-0.337	1.012
	1	22	2.473	1.686	1.920	2.893
CSSDI	0	69	4.923	4.531	4.688	2.594
	1	22	5.677	5.193	5.184	3.104

Table 4.6

Variable	Up	SE Mean	Minimum	Maximum	Q1	Q3
Mk Return	0	0.122	-2.994	0.933	-1.120	0.392
	1	0.617	1.023	14.995	1.487	2.363
CSSDt	0	0.312	1.064	16.772	3.283	5.467
	1	0.662	3.198	18.017	3.814	6.203

Table 4.7

Graphical representation of the information in table 4.6 and 4.7 is shown in figure 3 and 4 respectively.

Market Rate Of Return For Each Quartile

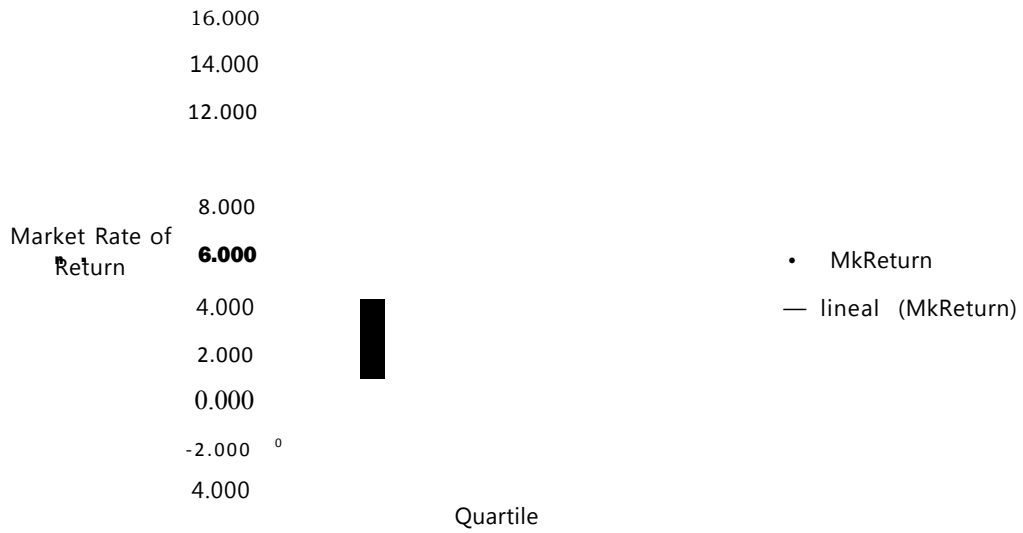


Figure 4,3

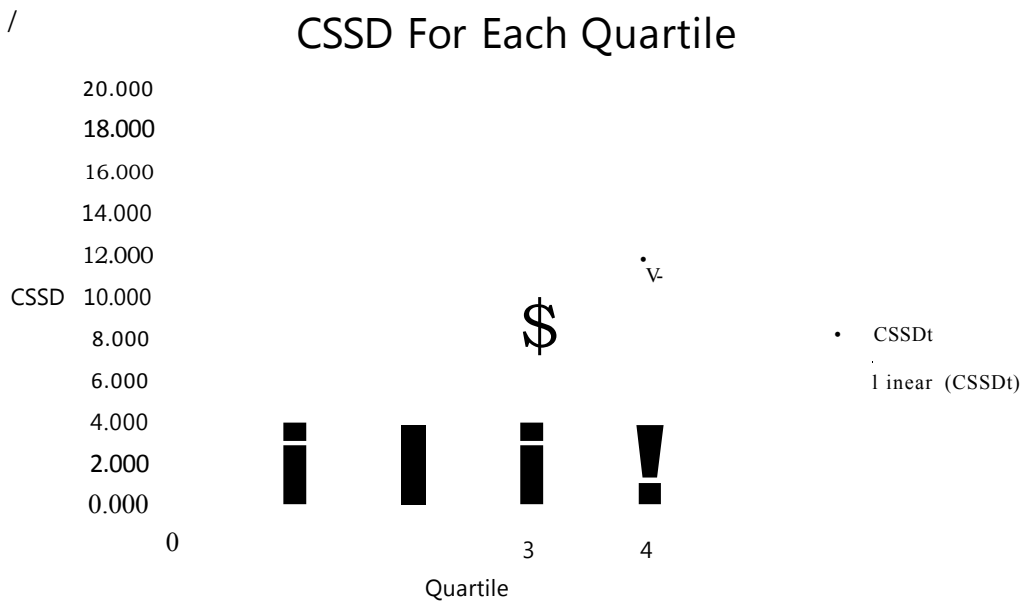


Figure 4.4

4.2.1.2 Descriptive Statistics: Market Return, CSSDt by Up for the sample of 1998-2001

the number of observations which were in the extreme upper tail were 42 out of the total 208 observations, this was done after all the observations were grouped into four Quartiles from 1-4 then dummy variables based on market return at time and the quartile where that observation falls. The mean and the CSSDt are shown in the table seven and the minimum and the maximum values are shown in table 4.8

Variable	Up	N	Mean	Median	TrMean	StDev
Mk Return	0	166	-0.6913	-0.5644	0.6388	0.9124
	1	42	2.182	1.667	2.023	1.428
CSSDt /	0	166	3.333	2.331	2.825	3.984
	142	6.58	5.58	5.39	7.35	

Table 4.8

Variable	Up	SE Mean	Minimum	Maximum	Q1	Q3
Mk Return	0	0.0708	-3.6955	0.8550	-1.1492	-0.0623
	1	0.220	0.880	6.667	1.150	2.925
CSSDt	0	0.309	0.000	24.236	0.347	4.934
	1	1.13	0.77	40.16	1.77	8.93

Table 4.9

4.2.1.3 Descriptive Statistics: Market Return, CSSDt by Up for the sample of 2003-2012

The period had a total number of 498 observations out of which 125 were in the extreme the CSSDt and mean market return are shown in the table together with the corresponding values of minimum and maximum

Variable	Up	N	Mean	Median	TrMean	StDev
CSSDt	0	373	45.747	45.755	45.753	0.536
	1	125	45.860	45.816	45.829	0.620
MarkctRe	0	373	-0.7257	-0.2252	-0.5540	1.9053
	1	125	4.151	3.039	3.784	£.873
Variable	Up	Mean	Minimum	Maximum	Q1	Q3
CSSDt	0	0.028	44.617	46.698	45.261	46.197
	1	0.055	44.752	48.005	45.370	46.249
mklRetum	0	0.0987	-10.1629	1.7236	-1.4277	0.6270
	1	0.257	1.746	17.520	2.337	5.083

Table 4.10

4.2.2 Descriptive Statistics: Mkt Return, CSSDt by Down

Descriptive statistics on the market return were obtained based on the market return and CSSDt when the market return lies in the extreme lower tail. Dummy variables were used depending on the quartile the observations falls, it was 1 if the value of the market return at time t lied in the extreme upper tail of the distribution, and 0 otherwise

4.2.2.1 Descriptive Statistics: Mkt Return, CSSDt by Down for the sample 1996-1997

Out of the total 91 observations 22 were in the extreme lower as shown in table 4.11 the mean market return and the corresponding CSSDt is also shown for both the observations that were in the extreme lower as well as those that were not in the extreme lower tail.

Variable	Down	N	Mean	Median	TrMean	StDev
MkReturn	0	69	0.931	0.496	0.704	1.965
	1	22	-1.659	-1.540	-1.629	0.590
CSSDt	0	69	4.953	4.531	4.701	2.604
	1	22	5.584	4.835	5.170	3.096

Table 4.11

Variable	Down	SE Mean	Minimum	Maximum	Qi	Q3
MkReturn	0	0.237	-0.865	14.995	0.113	1.476
	1	0.126	-2.994	-0.924	-2.235	-1.147
CSSDt	0	0.314	1.064	18.017	3.322	5.633
	1	0.660	2.679	16.772	3.625	5.978

Table 4.12

CSSD Market Down

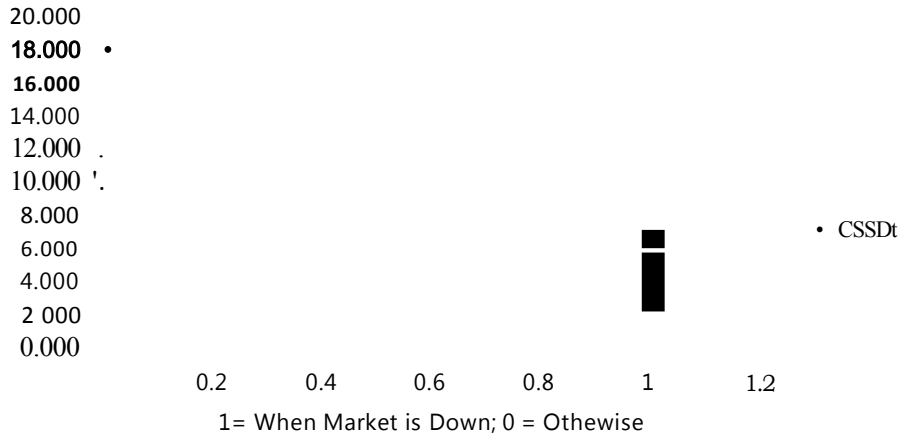


Figure 4.5

4.2.2.2 Descriptive Statistics: Mkt Return, CSSDt by Down for the sample 1998-200!

The descriptive statistics for the market return and CSSDt are shown in this report in table 4.13 and 4.14. Out of the 208 observations 82 were in the extreme lower tail with a mean market return of -1.3811, the minimum and the maximum values are also shown for the observation that were in the extreme lower tail.

Variable	Down	N	Mean	Median	TrMean	StDev
Mk Return	0	126	0.716	0.238	0.561	1.362
	1	82	-1.3811	-1.1500	-1.3142	0.7654
CSSDt	0	126	3.855	2.524	3.151	5.450
	1	82	4.193	2.892	3.686	4.255

Table 4.13

Variable	Down	SE Mean	Minimum	Maximum	Q1	Q3
Mk Return	0	0.121	-0.566	6.667	-0.244	1.187
	1	0.0845	-3.6955	-0.5689	-1.7379	-0.7724
CSSDt	0	0.486	0.000	40.161	0.218	5.566
	1	0.470	0.324	20.232	0.880	6.132

Table 4.14

4.2.2.3 Descriptive Statistics: CSSDt, MarketReturn by Down for the sample period 2003-2012

Out of total 498 Observations 125 were in the extreme lower tail. The average CSSDt and the market return for the entire period as well as the corresponding minimum and maximum values are shown in table below

Variable	Down	N	Mean	Median	TrMean	StDev
CSSDt	0	373	45.781	45.777	45.772	0.583
	1	125	45.758	45.767	45.763	0.484
MarketRe	0	373	1.619	0.871	1.308	2.515
	1	125	-2.845	-2.286	-2.675	1.756
Variable	Down	SE Mean	Minimum	Maximum	Q1	Q3
CSSDt	0	0.030	44.617	48.005	45.267	46.227

	1	0.043	44.761	46.619	45.469	46.116
MarketRe	0	0.130	-0.998	17.520	0.050	2.345
	1	0.157	-10.163	-1.057	-3.726	-1.408

Table 4.15

4.3 Dummy variable regression results

The investigation of the presence of herd behavior in the equity markets was done by employing dummy variable regression tests that are similar to CH. The coefficients on the dummy variables capture differences in the CSSDs and shed light on the extent of herd behavior across trading weeks with extreme upward or downward price movements. Eq. (3) is estimated using the 1%, 2%, and 5% of the price movement days as the / definition of extreme price movement. The report gives the parameter estimates along with heteroscedasticity consistent t-statistics. The findings reveal the positive and statistically significant [V and fV coefficients. This indicates that equity return dispersions actually tend to increase rather than decrease during market environments characterized by extreme price movements. This is inconsistent with their operational definition of herding which requires a decrease in dispersion levels hence reveal absence of herding behavior at the NSE during the period of 1996-1997, 1998-2001 and 2003-2012

4.3.1 Regression Analysis: CSSDt versus Up, Down for the sample period 1996-1997

In this study, dummy variables were created for two-market condition i.e. when the market is up and when the market is down. Then a regression analysis with CSSD as the response variable, using dummy explanatory variables considering two rules to be followed include: First any of the original categorical variables that the⁴ dummies are based on shouldn't be used, i.e. market return cannot be used as independent variables. Second one less dummy than the number of categories for any categorical variable should not be used. The regression equation obtained was

$$\text{CSSDt} = -4.61 + 1.06 \text{ Up} + 0.971 \text{ Down}$$

Predictor	Coef	SE Coef	T	P
Constant	4.6134	0.3951	11.68	0.000
Up	1.0639	0.6997	1.52	0.132
Down	0.9708	0.6997	1.39	0.169

S = 2.709 R-Sq = 3.5% R-Sq(adj) = 1.3%

Analysis of Variance

Source	DF	SS	MS	F
Regression	2	23.618	11.809	1.61
Residual Error	88	645.580	7.336	
Total	90	669.198		

Source	DF	Seq SS
Up	1	9.493

Down 1 14.124

The coefficients of the regression are 1.06 up and 0.971 down, with a p-value 0.206 which implies that the values are significant and the variables have an influence on the market condition. The R-sq is 3.5%, this shows that 3.5% of the variability in CSSDt can be explained in the independent variables. With analysis of the variance the F value is of 1.61 is significant since the corresponding value of 0.206 is below 0.5

4.3.2 Regression Analysis: CSSDt versus Up, Down for the sample period 1998-2001

The regression equation obtained for the sample period 1998-2001 produced almost similar results with the one for the sample period 1996-1997

$$\text{CSSDt} = 2.49 + 4.09 \text{ Up} + 1.70 \text{ Down}$$

Predictqr	Coef	SE Coef	T	P
Constant	2.4928	0.5231	4.77	0.000
Up	4.0880	0.9060	4.51	0.000
Down	1.7000	0.7442	2.28	0.023

S = 4.794 R-Sq = 9.1% R-Sq(adj) = 8.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	2	473.58	236.79	10.30	0.000
Residual Error	205	4711.49	22.98		
Total	207	5185.08			

Source	DF	Seq SS
Up	1	353.66
Down	1	119.92

The coefficients of the up and the down market are 4.0880 and 1.70 respectively with a p-value of 0.00 and a T value of 4.77. This implies that the values of the coefficients are significant. The R-sq is 9.1% and this shows that 9.1% variable in the CSSDt can be explained by this model in the regression. The F value is 10.3 which is also significant since the corresponding P-value in the variance analysis is 0.00

4.3.3 Regression Analysis: CSSDt versus Up, Down for the sample period 2003-2012

The regression equation is

$$\text{CSSDt} = 45.7 + 0.118 \text{ Up} + 0.0164 \text{ Down}$$

Predictor	Coef	SE Coef	T	P
Constant	45.7417	0.0355	1289.53	0.000
Up	0.11821	0.06127	1.93	0.054
Down	0.01641	0.06127	0.27	0.789

$$S = 0.5586 \quad R\text{-Sq} = 0.8\% \quad R\text{-Sq(adj)} = 0.4\%$$

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	2	1.2118	0.6059	1.94	0.145
Residual Error	495	154.4600	0.3120		
Total	497	155.6718			

Source	DF	Seq SS
Up	1	1.1894
Down	1	0.0224

The coefficients of the regression are 0.118 up and 0.0164 down, with the p-value of 0.000 and T value of 1289.53. This implies that the coefficient values are significant, and this implies they significantly contribute to the market condition. The R-sq is 0.8% implying that the 0.8% variability in CSSDT can be explained in the dummy variables. In the analysis of the variance the F value is 1.94 with a corresponding P-value 0.145, the F value is significant since the p value is less than 0.5

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CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary and conclusion from the research findings as per the objective of the study. Based on the findings, recommendations have been given.

5.2 Summary of Findings and Conclusions

The purpose of this research was to establish if herding behavior exists among investors at the NSE using the returns of the securities in the market. The study provides evidence that herd behavior does not exist through a regression analysis done in three sample periods. These results are consistent with the predictions of rational asset pricing and contradict the predictions of herd behavior. In all the three periods the regression done produced similar results in that the coefficients in the upper and lower tail were all positive. For period 1996-1997 the beta coefficient for the upper tail was 1.06 and the lower tail was 0.971. For the 1998-2001 the beta coefficient for the upper tail was 4.09 and the lower tail was 1.70. The beta coefficients for the period 2002 to 2012 were 0.118 for the upper tail and 0.0164 for the lower tail. The results were heteroscedasticity consistent (-statistics confirm the coefficients' reliability) with the values of P and T from the regression showing that the coefficients were significant. Results also reveal that independent variable had an influence on the dependent variable through thus, drawing conclusion that dispersions are characterized by large swings in average prices.

The general conclusion drawn from the results is that there is no evidence of herding among investors at the NSE and as much as changes in equity prices may bring about changes in market return it may not be obvious that herding exists in the market.

5.3 Conclusions and Recommendations

Because dispersion quantifies the average proximity of individual returns to the mean, it reveals the presence of herd behavior when individual returns follow the lead of the portfolio returns. The strategy was to compare the predictions of herd behavior alongside those of rational asset pricing models during periods of market stress, or exaggerated price movements. Dispersions were found to increase significantly during periods of large average price changes, implying individual returns do not cluster around either the market or industry returns during periods of market stress. The study also examined the hypothesis that herding is an attribute of market stress only during extreme market declines. A comparison of actual dispersion with the dispersion of returns predicted by the market model shows that, consistent with the predictions of the rationality hypothesis. Thus, the preponderance of the evidence supports the predictions of rational asset pricing models and suggests that herding is not an important factor in determining equity returns during periods of market stress.

Local studies done at the NSE show that herding behavior has an influence on investment decisions and security prices, this study is inconsistent with the previous findings since it reveals no presence of the behavior in the market. Herding behavior may not be in existence in emerging markets since securities are rarely traded due to reasons such as lack of funds and lack of information about the securities, and if they are it is by a few informed people who control the market like the institutional investors. Action of small

investors who are more likely to herd are very insignificant in the market hence their effect may not be felt

5.4 Limitations of the Study

The items discussed as limitations hindered the scope of my study in one way or another. The first challenge I faced was how to get the data. Data was not available freely but one had to purchase the data from the NSE which the cost was pegged to the number of years. The higher the number of years the higher the cost hence the study could not capture longer term due limited availability of funds.

The second limitation was on data obtained from the NSE. The raw data obtained from the NSE was in a total mess. This required a lot of work which made me at first to choose earlier years where clean data was readily available. The study would have been much richer if clean data was made available on time for the ease of data analysis.

The third limitation was time frame for the research. Time factor could allow my study to cover a longer period as I would have wished since the amount of work involved in arranging the data in a way that would have it easier to analyze the data was quite tedious. A comparison of more number of periods would have yielded better results since herding might have occurred in one period and not the other rather than basing ones conclusion on a limited number of years.

The fourth limitation was due to the fact few local studies have been done on behavioral finance. This posed a challenge whereby most of the literature used in this study was based on studies done on developed markets whose securities may be much more

developed than our market hence making it difficult to generalize information obtained from these and compare the same with the NSE.

5.5 Suggestions for Further Research

This a unique study that seeks to show the existence of herding behavior at the NSE using weekly equity returns as opposed to primary data where there is use of questionnaires. It is necessary to have further researches to confirm the findings of this research with the larger time frame period with a more diversity of variability in returns

The study mainly used weekly returns. Further researches should be done using daily and monthly returns to show whether herding exists in the market. There is more likelihood that if one uses monthly data or daily the results may be different since the magnitude of the dispersion measure is considerably different and more specifically individual returns have a greater opportunity to stray farther from the mean in monthly returns.

The other area recommended relates to the researcher trying to find out how long herding behavior period lasts in the market. It would measure how the herd behavior contributes to the market bubble and show the period it would last for governments to be called to intervene.

Finally, future research can be conducted on the same project but using different analytical tools and different methodology. The replication of research would determine if the same conclusions can be reached.

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Appendix 1

Companies Listed at the Nairobi Securities Exchange

AGRICULTURAL

Eaagads Ltd

Kapchorua Tea Co. Ltd

Kakuzi

Limuru Tea Co. Ltd

Rea Vipingo Plantations Ltd

Sasini Ltd

Williamson Tea Kenya Ltd

COMMERCIAL AND SERVICES

Express Ltd

Kenya Airways Ltd

≪

Nation Media Group

Standard Group Ltd

TPS Eastern Africa (Serena) Ltd

Scan group Ltd

Uchumi Supermarket Ltd

I lutchings Biemer Ltd

Longhorn Kenya Ltd

TELECOMMUNICATION AND TECHNOLOGY

AccessKenya Group Ltd

Safaricom Ltd

AUTOMOBILES AND ACCESSORIES

Car and General (K) Ltd

CMC Holdings Ltd

Sameer Africa Ltd

MarshaHs (E.A.) Ltd

BANKING

Barclays Bank Ltd

CFC Stanbic Holdings Ltd

Diamond Trust Bank Kenya Ltd

Housing Finance Co Ltd

Kenya Commercial Bank

National Bank of Kenya Ltd

NIC Bank Ltd

Standard Chartered Bank Ltd

Equity Bank Ltd

The Co-operative Bank of Kenya Ltd

INSURANCE

Jubilee Holdings Ltd

Pan Africa Insurance Holdings Ltd

Kenya Re-Insurance Corporation Ltd

CFC Insurance Holdings

British-American Investments Company (Kenya) Ltd

CMC Insurance Group Ltd

INVESTMENT

City Trust Ltd

Olympia Capital Holdings Ltd

Centum Investment Co Ltd

Trans-Century

MANUFACTURING AND ALLIED

B.O.C Kenya Ltd

British American Tobacco Kenya Ltd

Carbacid Investments Ltd

East African Breweries Ltd

Mumias Sugar Co. Ltd

Unga Group Ltd

Eveready East Africa Ltd

Kenya Orchards Ltd

A.Baumann CO Ltd

ENERGY AND PETROLEUM

Kenolkobil Ltd

Total Kenya Ltd

KenGen Ltd

Kenya Power & Lighting CO Ltd

CONSTRUCTION AND ALLIED

Athi river Mining Ltd

Bambini Cement Ltd

Crown Berger Ltd

E.A Cables Ltd

E.A Portland Cement Ltd