EFFECT OF COGNITIVE BIASES ON INVESTMENT DECISIONS AMONG RETAIL INVESTORS AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

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

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

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This project would not have been possible without the guidance of my supervisor Dr. Mirie Mwangi and the entire University of Nairobi Team. God bless you.

DEDICATION

This project is dedicated to my entire family, my wife Agnes, sons Allan and Arnold. Thank you for your patience as I doubled up as a husband/father and student. God bless you.

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LIST OF ABBREVIATIONS

BAPM	Behavioral Asset Pricing Model
BF	Behavioral Finance
BV	Book Value
CBD	Central Business District
CDS	Central Depository Settlement
CMA	Capital Markets Authority
EMH	Efficient Market Hypothesis
ESOPS	Employee Share Ownership Plans
FSA	Financial Services Authority
IPO	Initial Public Offering
MV	Market Value
NSE	Nairobi Securities Exchange
OECD	Organization for Economic Co-operation and Development
R&D	Research and Development
ROA	Return on Assets
ROE	Return on Equity

ABSTRACT

Decision-making is a complex activity and decisions can never be made in a vacuum by relying on the personal resources and complex models, which do not take into consideration the situation. Analysis of the variables of the problem in which it occurs is mediated by the cognitive psychology of the investor. Behavioral finance explains market anomalies which traditional asset pricing models fail to explain. This study sought to establish the cognitive biases which influence retail investment decisions. Descriptive research design was employed. A sample of 96 retail investors was used. Probability sampling technique was adopted to randomly select the 96 respondents from the 21 brokerage firms trading at the Nairobi Securities Exchange. Data collection was done via questionnaires. It was analyzed using SPSS Version 22 to generate frequencies, mean scores, percentages, and multiple regression analysis. Major findings indicated that results of retail investment decisions were significantly correlated to: herding effect bias, overconfidence bias, excessive optimism bias and accounting information bias. The study concluded that cognitive biases play a significant role in retail investment decisions. The study recommends that the NSE should offer investment education to investors in order to minimize the effects of cognitive biases; CMA should track rogue brokers who may over charge unsuspecting investors for market information and individual investors should seek for market information from their fund managers in order to make rational decisions while investing.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Reilly and Brown (2006) refer to investment as the process through which investors commit their money for a given time for the purposes of deriving returns which will be equal or more in compensating the investor for that time when that money is invested, taking into account factors like inflation and uncertainty associated with such a decision. An investment decision refers to the choice to postpone consumption and defer it to a future date assuming that the future date will enable the individual to consume at a greater capacity. Faced with such a choice, an individual often prefers the option that seems to him most useful (Neuman & Morgensten, 2015).

Investment decisions require that the investor is alive to the realities of the prevailing circumstances. Investors do not always follow the laid out personal resources or complex models as proposed by the traditional finance theories. Every investor considers various issues and some of these are purely guided by the psychological influences at play at the time of investing. Some of these issues also extend to the environment. Decision-making is therefore the process of opting for a particular alternative from many alternatives. This activity usually follows an accurate assessment of all the available alternatives (Sewell, 2005). Investors are required to continuously update the information they have on regular basis and in multidimensional aspects of businesses in order to attain their set goals in the highly competitive business world (Waweru, Munyoki & Uliana 2008).

Additionally, they have to have the ability to predict the output mean- variance optimization. Such a process is quite common with institutional investors; when

applied by the retail investors, it has often failed, since they are susceptible to cognitive biases (Shanmugasundaram & Balakrishnan, 2010).Investment involves staking money in an investment vehicle or product. Investment managers are mainly the ones who make these decisions in an investment company or institution. They usually arrive at these decisions by use of technical analysis, fundamental evaluation and judgment. The decisions regarding investments are mostly guided by decision tools (Chong & Lal, 2011). Therefore the information design and the interplay of elements in the market altogether control people's investment decisions and market results. The investors' marketing strategies stem from strong principles of making decisions which further relates to why people sell or buy goods (Shefrin, 2007). They include: loss aversion, cognitive dissonance, mental accounting, representativeness, anchoring, overconfidence and herding behavior.

Further, retail investors depend on mass media before they make investment decisions, as the professional investors depend on essential and practical analysis and little on selected analysis. That's why market contributors are normally exposed to stable flow of information, varying from quantitative financial data to financial news from the media, and publicly exchanging ideas and suggestions (Andrikopoulos, 2006).

In Kenya, the only organized stock market is the Nairobi Stock Exchange (NSE). The NSE dates back to 1920s when it commenced as an informal way of dealing in shares. Now it is quite advanced with the creation of the capital market authority (CMA) and introduction of the central depository system. Investor behaviour at the NSE has been shown to be influenced by forces outside what would be expected of rational beings. Investors do not seem keen to study the market before staking their

money on particular stocks. They do not consult investment professionals or finance experts, yet they continue to invest large sums of money in stocks (Merika, 2008). This study was be guided by the following theories; Efficient Market Hypothesis, Prospect/Loss-Aversion-Theory and Herding Theory.

1.1.1 Cognitive Biases

A cognitive bias is an inclination towards or against something, which prejudices rational decision making. This means that people draw conclusions with regard to other people and circumstances under the influence of their own emotions about the particular stimulus, and thereby respond based on those emotions. This leads to distortion of perception and erroneous responses (Haselton, Nettle &Andrews, 2005).According to Razek (2011) overconfidence is an overestimation of the probabilities for a set of events. Its proponents argue that it stems from a comparison between a probability of an event occurring and the possibilities of all the other related events occurring; then one tends to apportion a bigger probability to the particular event compared to what is correct with regard to the rest of the related events.

Agrawal (2012) posits that overconfidence usually drives people to overrate their knowledge, underestimate risks and overrate their capacity to control events. It originates in people's bias during the evaluation of evidence. Scholars have often found evidence of the existence of overconfidence bias in financial decisions. Herding effect in the financial market is commonly defined as the propensity of investors to follow others' actions i.e. the tendency to invest money where everybody else is putting theirs. They tend to perceive themselves as part of a group and they therefore 'agree' on where to invest (Chandra, 2008).

This sometimes result in stock price deviation from the fundamental value of the securities; thereby impacting many good chances for investment. Financial professionals e.g. fund managers, or financial analysts on the other hand are usually evaluated through the subjective sporadic evaluation on a relative base and comparing them with their peers. In such a scenario, herding can influence the assessment of professional performance since the low-ability ones may copy the performance of their high-ability counterparts in an effort to build their own professional reputation (Andrikopoulos, 2006).

Excessive optimism is a bias responsible for the individuals' belief that negative events are unlikely to happen to them in comparison to others (Puri, 2007). It comes as a result of biases that include self-attribution and illusion of control. Individuals sometimes think that they can manage the results of situations that are not controlled. In a state where an investor attaches good results to its ability and bad results to misfortune is what is referred to as self-attribution. ZhaoyangGu, (2007) analyzed the study by Eastwood and Nutt (2005) and found that individuals are likely to react excessively to positive market information and under-react to negative information.

Excessive optimism happens when individuals overrate the occurrence of favorable results and underrating the occurrence of unfavorable results (Shefrin, 2007). For instance people undervalue the possibility of getting a divorce or even getting a bad illness they always focus on having good health and living more than other and having great and talented children (Shefrin, 2007). For financial intermediation, optimism is very important in that it can influence commercial, financial and accounting choices; it can lower security prices where there are short-sale limits that

can result to little or no responses in stock prices. Accounting information according to Lal and Chong, (2011) is the past performance of the company, price movements, the firm status, reputation of the firm and the accounting reports.

The greatest influence of an entrepreneur in settling to invest in stocks is that a retail investor evaluates the basic activities of the company as a pointer of interest. This is what is considered financial information. Financial information and the anticipated firm returns have an important influence on the decision to invest in shares (Merika, 2008 & Easley, 2010). Easley and O'Hara (2010) indicated that when creating a target to invest, people normally start with examining the firm's position of finance based on a few aims that include earning per share and returns on equity. Afterwards, their emotional thoughts of the evaluations come to affect and try to defend their decisions on investing in a given firm stock.

1.1.2 Investment Decisions

An investment decision refers to the choice to postpone consumption and defer it to a future date assuming that the future date will enable the individual to consume at a greater capacity. Faced with such a choice, an individual often prefers the option that seems to him most useful (Neuman & Morgensten, 2015).Investment decisions also refer to expecting returns at a future date from money committed to a recent course which can be done by the individual himself or a contracted professional (Bodie, Kane & Marcus, 2008). The returns however depend on the level of financing, the nature of the venture and the experience of the person managing the venture (Griffith, 2000).

The procedure of making decisions comprises the study of few aspects and following different procedures. This is the procedure of deciding on a specific option. It follows after a fair assessment of all the choices (Subramani & Venkatraman, 2003). Harper (2012), indicates that investment decisions are made from large models of finance. The models are comprised of investment risk and returns like Capital Assets Pricing Model. Making of decisions is the procedure where a person responds to the advantages and disadvantages that come through studying the options and making decisions on the particular goals and actions to be taken (Akintoye, 2006).

1.1.3 Cognitive Biases and Investment Decisions

Behavioral finance studies individuals' behavior, particularly investors and how they make mistakes in their financial decisions because of their emotions (Dimitrios, 2007). Making of decisions is the process of selecting the best option amongst a list of many options. This comes after a good assessment of all the choices (Abiola & Adetiloye, 2012). Agrawal (2012) argues that overconfidence affects the behavior of both the secondary and primary market traders. People will always tend to be biased and therefore overestimate their ability to forecast the market trends.

Akintoye (2006) argues that people remain overconfident in spite of failures as they can always forget their failures while remembering their successes at will and then emphasize future plans and disregard past failures. Overconfidence is usually manifested in a stock market through excessive trading. (Loungand Ha, 2011) argue that when a particular portfolio dominates others, there is no regard to the past disappointing performance of it in many actively managed funds. Subrahmanyam (2007), argues that overconfidence about private signals often leads to an

overreaction thereby occasioning phenomena like the book/market effect and long-run reversals.

Herding investors are usually driven by the masses' decisions of buying or selling stocks. This is however contrasted with the rational investors, who are mostly informed and therefore ignore following the masses. This in effect makes the market efficient. Herding shakes the market and makes it inefficient usually characterized by speculative bubbles. In general, herding investors are comparable to prehistoric men who were not knowledgeable in matters investment and therefore lived in groups and they used to support one another in times of need especially protection from attacks by wild animals (Caparrelli*et al*., 2014).

Excessive optimism, as illustrated by Robinson and Puri (2007) posits that many positive individuals do a lot of work, expecting to retire later, investing more in stocks and saving much, whereas the extreme optimists portray financial habits that are not regarded as sensible. When making a financial decision, excessive optimism results to ineffective consequences. Agrawal (2012) posits that optimism fails to take into account the factors that could influence the outcome of a venture e.g. skills and effort and instead ties such an outcome to hope. Ramnath *et al*. (2008) explain that over-optimism always overvalues the likelihood of the occurrence of desired outcomes while it downplays the likelihood unfavorable events. They further argue that investors' earnings forecast errors are usually more profound during buy recommendations and significantly cynical while advising on which stock to sell.

Mental accounting underscores the inclination to put events into mental compartments. The individual's behavior is then influenced by the differences between the compartments more than the events themselves. A case in example is a situation where investors fail to offload a stock that had previously performed very well and made a lot of gains when it is currently underperforming. When the market is bullish, people are fine with paper gains. When thereafter the market undergoes a correction thereby deflating the investor's net worth, they are more likely to offload such stocks even with a small profit margin. This is brought about by the mental compartments they had made during the gain period and thereby they keep waiting for the return of that past gainful period (Thaler, 2011).

1.1.4 Retail Investors at the Nairobi Securities Exchange

According to Jing Chen (2011) retail investors, also variously referred to as individual investors, are investors who buy stocks individually or as a group. At the NSE, security price move in excess of the fundamental market expectations. The most recent being the IPO where the Safaricom shares were oversubscribed by almost twice and some investors took loans to purchase the shares which resulted to losses as the share price did not increase as expected. This was a case of herding where the investors bought the shares because everybody did. This is also witnessed during the corporate earnings announcement where, when the performance of the company is good the share price goes up for a short period then they fall.

A study done by Chelangat (2011) showed that male investors are more overconfident compared to the female investors. They believe in the precision of their knowledge. Female investors are affected more by herding where they seek advice from friends and observe what others are doing. They are also prone to regret aversion bias. Other biases affected both the male and female investors alike, the differences in effect being negligible. The study also revealed that the age of investors matters in the way they make their investment decisions. The older investors who have experience at the NSE were more rational in making investment decisions and they displayed overconfidence bias as they believe they can predict the market correctly. Younger investors are prone to herding as the trend in the market seems to affect their decisions. They are also prone to other biases more than the older investors.

Investigations into the IPO market in Kenya by Fredrick (2012) showed that, on average, IPOs provided abnormal returns in the days following the opening of the

public trading. This was responsible for the oversubscription of the subsequent IPOs. Some of the IPOs aftermarket performance has however been dismal since. The analysis showed that investors anticipated abnormal returns as evidenced in previous IPOs like Ken Gen and rushed for IPOs like Safaricom which led to an oversubscription. Eveready on the other hand did not last long enough, leaving millions of investors with depreciated stocks. This suggests that investor decisions were potentially influenced by cognitive and emotional biases that led to their faulty investment decisions as explained by behavioral finance theorists.

1.2 Research Problem

Investors' emotions and psychology and how they influence investment decisions are what behavioral finance tries to investigate. Behavioral finance studies individuals' behavior, particularly investors and how they make mistakes in their financial decisions because of their emotions (Dimitrios, 2007). Making of decisions is the process of selecting the best option amongst a list of many options. This comes after a good assessment of all the choices (Abiola & Adetiloye, 2012). Investment decisions are made with the hope of gaining from the investment either in the short or long term.

According to Chen (2011) retail investors are those who buy stocks individually or as a group. Lu (2010) contends that retail investors are likely to come across more challenges in an attempt to come up with rational investment decisions compared to corporate investors. Mostly, corporate investors have access to important market information since they have more resources therefore they are better informed with regard to their goals of investing. Retail investors at the Nairobi Stock Exchange are

therefore susceptible to this challenge of lack of adequate information when compared to their corporate counterparts (Ndiege, 2012).

Chira, Adams and Thornton (2008) studied how biases, heuristics, and framing effects affected business students. The survey study included sixty-eight students at Jacksonville University in USA in November 2007. The findings established that when students were more objective in their decisions, they were less likely to be influenced by overconfidence and over-optimism in assessing stocks. Chandra (2008) investigated the effect of behavioral factors on investor's psychology among investors in the Indian Stock Exchange, India. The author discovered that as opposed to the classical finance theory, rational decision making is usually absent during investment. Such decisions are greatly affected by behavior like greed and fear, heuristics, mental accounting and anchoring.

Ombai (2010) studied the effect of behavioral finance at the Nairobi Securities Exchange during the global financial crisis. He found that the general dip in returns of stocks comprising the NSE 20 share index coupled with the decline in returns in the NSE 20 share index itself was a pointer to the existence of herding behavior. During investment at the Nairobi Stock Exchange, psychological biases have overtaken rational behavior on different occasions. Recent studies have observed the presence of fear, heuristics, mental accounting and anchoring as indicated by Werah (2006).

These studies however have not adequately addressed all the biases affecting NSE investors while making their investment decisions on which stocks to invest in. Again the available studies seem to have been done a more than five years ago, and given the dynamics at play in a stock market on any single trading day, it is important that there is a constant update of the available literature which this study intends to do. This study therefore intends to bridge this knowledge gap by

establishing the impact of overconfidence, herd behavior, excessive optimism and accounting information on the investment decisions among the retail investors at the NSE.

1.3 Objective of the Study

The objective of the study was to examine the effect of cognitive biases on investment decisions among the retail investors at the Nairobi Securities Exchange.

1.4 Value of the Study

This study will add value to the body of information in the sphere of finance. It would form a reference for future students and researchers keen on expanding their knowhow in behavioral finance. The study makes significant contributions to the area of behavioral finance through exploring the relationship between the various economic social, cultural, demographic and behavioural factors that influence the overall investment decisions. It may therefore form the basis for problems in future research.

This study would be helpful to the management of the listed firms in Kenya as it highlights the biases affecting the retail investors in the NSE in that they may use the findings to customize the information that they relay to existing and or potential investors with the aim of convincing them to invest in those companies' securities. It will also the financial institutions and brokerage firms to widen their clientele base by coming up with policies that will lead to an increase of individual participation in the securities market.

For policy makers; it would help them to formulate appropriate strategies that help to minimize the negative impact of the factors identified. This will help them to better advise the potential clients i.e. investors and investment managers can understand the contribution of psychological and emotional factors towards their investment decisions as well as forming a basis for self-evaluation by individuals in light of their previous decisions to gauge the extent of their biasness and make necessary adjustment.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter, literature is reviewed on the relevant theories and other determinants of retail investment decisions which include Investors Financial Literacy, Financial Capability and Education Level of the investors. The chapter ends with a summary of the literature review.

2.2 Theoretical Review

This section presents the theories that guided this study as introduced in the following sub-sections.

2.2.1 Efficient Market Hypothesis

Eugene Fama developed the efficient markets hypothesis (EMH) in 1970. It posits that self-interested traders with private information are motivated to acquire and act on their information in order to gain profits, which contributes to more and more efficient market prices. The EMH theory holds that an investor cannot outperform the market because the stock price is a reflection of all available information (Lavelle *et al*., 2012). It is therefore a hard to forecast the movement of the prices. In efficient markets, information disseminates randomly and hence the randomness in the occurrence of stock prices (Pugh *et al*., 2010).

Arrival of new information is what drives the price changes and an efficient market has prices adjusting fast to new information. This surmises the argument that the current stock price is a reflection of all available information at that time. EMH concludes that for a majority of investors, information viz-a-viz analysis payoff

would likely not outweigh transaction costs and only a few investors at equilibrium can profit and outperform the market.

Critics of the EMH have taken issue with EMH by pointing out to renowned value investors like Warren Buffet who have over time outperformed the market. Events such as stock markets crash and insider trading have also cast doubt on EMH (Klein, 2013). The EMH theory is relevant to this study given the fact that based on this theory stock market data cannot in the long run be manipulated as the market is deemed efficient and factors in all available information. This is unlike the use of financial statements, which can be manipulated by employees to boost performance of ESOPs hence, justify their higher share prices. For the purpose of this study, stock performance will be measured using stock returns of firms listed in the NSE, which is deemed to be a weak form of efficient market (Khisa, 2016).

2.2.2 Prospect/Loss-Aversion-Theory

It was initially illustrated in 1979 by Tversky and Kahneman. Globally, it was seen as a unique explanation of how individuals experiment with risk. It claims that individuals portray a diverse range of emotions to profits and losses. People get much stressed by potential losses than they get excited from the profits. Losses always look greater than the profits of the same size- when they go deep in the pocket the worth of the money completely changes (Tversky & Kahneman, 1979).

This theory as well gives the explanation as to why investors cling to losses more than they take risks to avoid the losses so as to recognize the profits. It is for this reason that the investors stick at a dangerous place, in the hope that the prices will get back up. This is the same with gamblers who always keep doubling their bets in the hope that they will get back what they already lost. The rationale here is that

when we anticipate a return for the risks we take, we are likely to give it much worth often times greater than the value we would actually want to pay for it (Tversky & Kahneman, 1979).

Individuals usually fail to react reasonably to recent data because they totally fail to pursue the ideal mathematical structure. This theory used cognitive psychological system to illustrate some of the recognized differences of economic decisions made from the neo-classical theory. This explains how individuals structure and rate a decision including doubts and afterwards they see their options in terms of possible losses and profits, which relate to a certain position, which at most times is the purchase price. This shows that their options are relatively biased (Barberis & Thaler, 2003). This theory is suitable for the study as it explains the influence of biases on investment.

2.2.3 Herding Theory

Shiller (2002) propounded the herding behaviour theory. He argued that human beings have an inherent desire to belong to a group. This means that people will always want to be seen together with others. This is the whole idea of herd behavior. Moving with the herd, however, magnifies the psychological biases. Investors often spend very little time to analyze individual stocks in the market but focus on buying the stocks that are currently at the center of attention by other market players. Herding can be irrational when investors in stock markets sell their stocks to avoid losses when there is a large stock market decline because other investors are doing so hence they ignore all rational analysis and react in panic leading to market distortions.

According to Odean *et al*. (2007) herding behavior is adopted by people who think that they do not have adequate information and believe that the knowledge of other people can help them make investment decisions much faster and easily. Investors imitate the actions of others believing that other people have better information than they do. Shefrin and Statman (1985) argue that herding can lead to disposition effect where retail investors sell stocks which have appreciated in value while they tend to hold on to stocks that have lost value due to loss aversion.

2.3 Determinants of Investment Decisions by Retail Investors

Investment decisions are guided by several factors. Among the major influencers other than the biases include:

2.3.1 Investors Financial Literacy

Derrien, (2005) investigated whether higher levels of financial literacy lead to improved equity investment decisions. He specifically assessed how financial literacy influences the investors' behavior to choose actively managed stocks as opposed to passively managed companies in an event of an IPO issue of such a company. The study found that the more financial literate subjects chose funds whose expenses were lower.

In the present day rich and market-oriented atmosphere people are required to be in charge of their financial issues (Banerjee *et al*, 2015). People are required to be knowledgeable on what to do and how to invest their resources so as to maintain progress and realize returns. In a number of countries, pensions are tied to people's financial literacy. Experts and organizations in finance have lately communicated fears with regard to financial consciousness of consumers (OECD, 2005). The adjustments taking place in the financial markets and the challenges encountered by

the investors, underscore the necessity to measure the retail investors' knowledge on the ideas and terms concerning their ventures or credit concepts.

2.3.2 Financial Capability

In today's world, consumers' ability to deal with their finances greatly affects their quality of life. It is upon the consumers to actively get all the information and actively participate in all the activities that concern their finances as they are the recipients of the consequences resulting from any related decisions. The UK Financial Services Authority (FSA, 2005), indicates that financial ability comprises of a person's features which are an aggregate of several factors from both the micro and macro environments. The impact of environmental factors on an individual's ability is basic in light of the fact that each individual lives in a specific culture and has a place within different communities. The societal environment provides a context for the activities of the consumer while at the same time offering him/ her the platform for interacting with fellow actors in the community. This view therefore takes into account both the depth and breadth of financial capacity (Lusardi & Mitchell, 2006).

Financial skills and literacy are techniques that are displayed in the behaviour formed and shaped in regular and long-term financial management. Such abilities and skills are dependent upon on financial literacy and understanding and are impacted by attitudes towards the utilization of money i.e. spending and sparing (Cornelli, 2004). Consumers who engage in responsible financial behaviour are said to be considerate of the other members of that environment, when making their financial decisions. These may include family, relatives and friends (Mandell, 2006).

Such a consumers is alive to the fact that his decision affects other people in the community and may also carry potential future risks, either personal or social.

2.3.3 Education Level

Bernheim, (2008) emphasizes that most individuals do not have a basic financial knowledge and numeracy. A number of studies focusing on the American people indicate that Americans financial literacy is largely wanting. The NCEE occasionally conduct surveys among students and working adults to establish their financial knowledge. These results indicate very low levels of basic literacy among U.S population especially students in high school (Mandell, 2004). Merika (2008) analyzed data from Consumers covering knowledge on credit, savings, mortgages, and financial management. In this case, a questionnaire was administered to 1,000 respondents between the ages 18 to 98. The questionnaire was an open ended financial literacy quiz containing 28 items. Most respondents failed these questions, which was an indication of glaring lack of financial literacy across the whole population. In cases where smaller samples were taken from the same population, the findings were similar.

Nofsinger (2012) formulated a model of financial literacy for their study. The module measured knowledge on interest rates and inflation. The results from this survey indicated low levels of knowledge on these among older Americans, specifically those aged fifty years and above. It can be argued that financial education and planning for retirement planning involve decision making and that financial planning also affects planning for retirement. For instance individuals who are planning to retire are more likely to begin acquiring finance related knowledge.

2.4 Review of Empirical Studies

Chira, Adams and Thornton (2008) studied how biases, heuristics, and framing effects affected business students. The study was a survey that sampled 68 students Jacksonville University in USA during November 2007. A questionnaire was used to collect data among undergraduate and graduate students' with regard to their own perceptions of bias. The findings established that when students were more objective in their decisions, they were less likely to be influenced by overconfidence and over-optimism in assessing stocks. Students however did not indicate illusion of control bias or the familiarity bias.

Chandra (2008) explored the effect of investor's psychology on decision-making among investors in the Indian Stock Exchange, India. He examined the connection between investor's attitude towards risk and behavioral decision-making. He used secondary data. The author established that in contrast to the classical finance theory, retail investors rarely make sensible decisions in investment. Such decisions are largely affected by behavioral factors like greed, fear, cognitive dissonance and heuristics. These factors ought to be considered risk factors during investment.

Sairafi, Selleby and Stahl (2008) assessed the features of business students interested in investment. The study involved 700 business students from University of California in Los Angeles. The research held an abductive approach and used qualitative data. Data was collected through an Internet-based questionnaire. The findings indicated that herd behavior was most evident. This was a form of irrational behavior that could be explained by the learners' association with the learning process from where these study subjects were drawn.

Ismail, Maheran and Muhammed (2008) examined the relationship between retail investment decision making and rationality in the Malaysian capital market. The study sampled 500 retail investors in the Malaysian Stock Exchange. Descriptive research design was used. Data was collected using questionnaires and analyzed using Statistical Package for Social Sciences. The study established that frame of reference affected decision-making behavior of the investors.

Zhang, Bellamy and Kellogg, (2015) investigated the effect of behavioral biases on retail investors in Oslo, Norway. They wanted to find out whether the same kind of cognitive biases such as loss aversion and framing influenced investment. The study used descriptive research design to sample 300 investors in the Norwegian Stock Exchange. Questionnaires were used to collect data which was analyzed using the Statistical Package for Social Sciences. The study found that human judgments, including experts, are always biased and shows that conservatism bias is observed in experience investors.

Pompian (2016), conducted a survey on 290 top investment advisors from stock exchanges in 30 countries, to investigate the effects of cognitive biases. The study used the descriptive research design to sample 290 investors. The study used online questionnaires to collect data. He discovered that cognitive errors or biases shoot from original statistics, processing of information or errors of memory and therefore it might be due to defective analysis. Errors of cognitive do not come from emotion or other tendencies near some judgments, but slightly are from hidden mental processes of information or irrational tolerance in individuals' own attitudes. The writer states that this is as a result of cognitive errors resulting from bad reasoning,

level of education, advice and information which most times originate from these errors.

Abiola and Adetiloye (2012) studied Investor behavioural biases and the security market: in the Nigerian Securities Market. They examined the extent of behavioural biases among security market investors in Nigeria. They surveyed 300 randomly selected investors. They discovered that biases of anchoring, loss aversion, and framing were present in the stock market. They concluded that, awareness of behavioural biases is the crucial first step in reducing their adverse effect on decision making. They concluded that when information is readily available to investors, and that information is analysed in order to identify potential pitfalls, then there would be more rational decisions during investment.

Ombai (2010) studied the effect of behavioral finance at the NSE during the global financial crisis. He used a descriptive research design to investigate the effect of herd behavior, framing and anchoring. He used the behavioral finance for his study's framework and sampled 100 investors at the Nairobi Securities Exchange. The study used questionnaires to gather data. He found that the general dip in returns of stocks comprising the NSE 20 share index coupled with the decline in returns in the NSE 20 share index itself was a pointer to herding behavior.

Nyamute and Maina (2010) examined the effect of financial literacy on personal financial management practices among the employees of finance and banking institutions. The study used descriptive design to assess the difference between financially literate and illiterate investors. Data was collected from a sample of 192 employees via a structured questionnaire. The findings indicated that financial literacy may not always result in improved financial management. They associated

this outcome to the fact that emergency expectation is a behavioral aspect associated with how different individuals handle risk in spite of their having an appropriate competence in investment.

Aduda, Odera and Omwenga (2012) conducted a study on the financial performance and behavior of retail investors in trade shares of firms listed in the Nairobi Stock Exchange. Their objective was to establish how retail investors usually make their decisions in investment. The study used descriptive research design and sampled 150 investors. They used questionnaires to gather data. The study discovered that friends' influence; where the investors got their advice from their colleagues and friends before coming to the decision to go for the stocks and acceptable ideas about the market and from the current ongoing in the share prices movements were the obvious indication of biases present in the NSE.

2.5 Conceptual Framework

The independent variables in the study were overconfidence, herding effect, excessive optimism and accounting information. Retail investment decisions was the dependent variable.

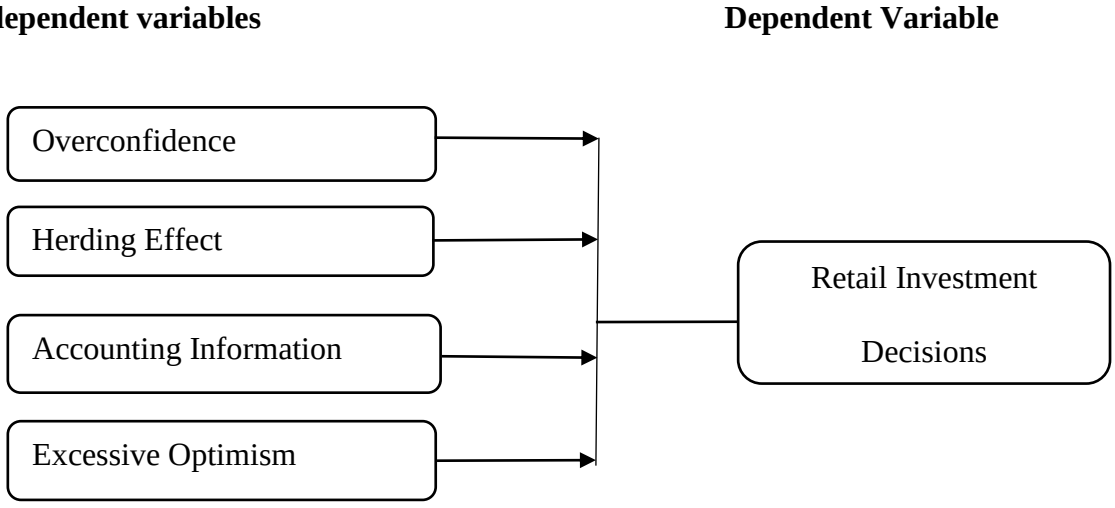


Figure 2.1 Conceptual Model

2.6 Summary of Literature Review

Zhang, Bellamy and Kellogg, (2015) argue that human judgments, including experts, are always biased and shows that conservatism bias is observed in experience investors. Pompian (2016) discovered that cognitive errors or biases shoot from original statistics, processing of information or errors of memory and therefore it might be due to defective analysis. Abiola and Adetiloye (2012) studied Investor behavioural biases and the security market: in the Nigerian Securities Market. They discovered that biases of anchoring, loss aversion, and framing were present in the stock market. They concluded that, awareness of behavioural biases is the crucial first step in reducing their adverse effect on decision making.

Nyamute and Maina (2010) indicated that financial literacy may not always result in improved financial management. They associated this outcome to the fact that emergency expectation is a behavioral aspect associated with how different individuals handle risk in spite of their having an appropriate degree of competence in investment. In summary, the study has argued that cognitive biases stem from prejudiced reasons. Nevertheless, this is not maintained by study proof. Instead, there are opposing studies which recommend that financial literate investors are not protected from the results of the common culture of investing seen in retail investors, and much of the factors automatically affect the thinking of the investors as well. It is not clear how retail investors are influenced by such cognitive biases as overconfidence, herding effect, excessive optimism and accounting information in their investment decisions. This study intends to fill this gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the method of research to be adopted in the study that is the research design, population, sample size, data collection, validity and reliability, data analysis, analytical model and test of significance, as discussed in the consequent sub-headings.

3.2 Research Design

The study employed a descriptive research design. The main aim of this design is to express the situation as it is. This kind of study tries to explain things such as characteristics, values, possible behavior, and attitudes.

3.3 Population and Sample size

Mugenda and Mugenda (2003) define a population as being objects or events having a common characteristic. The study involved surveying all the retail investors who trade at the Nairobi Securities Exchange. The NSE had 3.1Million investors as at December 2016 (CMA Bulletin, 2017).

The study sample size was determined using the Kothari (2004) formula as follows;

$$n = \frac{Z^2pqN}{e^2(N-1) + Z^2pq}$$

Where;

n = sample size for a finite population

N = size of population

p = population reliability (or frequency estimated for a sample of size n), where p is 0.5 which is taken for all population

q = 1-p = 0.5

e = margin of error considered as 10% for this study

Z = value for the selected alpha level (at 0.05 level of significance), Z is 1.96

Based on the above formula, the sample size for this study was;

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5 \times 3{,}100{,}000}{(0.1)^2\,(3{,}100{,}000-1) + [(1.96)^2 \times 0.5 \times 0.5]}$$

$$n = \frac{2977240}{31000.9505}$$

$$n = 96$$

Therefore the study sample size was 96 investors.

3.4 Sample Design

The study adopted a probability sampling technique to randomly select the 96 respondents from the 21 brokerage firms. A respondent was selected randomly from customers being served in a brokerage firm in a given day.

3.5 Data Collection

Semi-structured questionnaires were used for data collection. The respondents filled them. It consisted of 16 questions concerning the fundamental heuristics affecting investment decisions. The questionnaire had three sections.

Section A included general information of the respondents. Section B had questions on the investment decisions i.e. objectives of investment and proportion of income invested. Section C included 4 sub-sections; Sub-section (i) contained statements on overconfidence, Sub-section (ii) contained statements on herding effect, sub-section (iii) contained questions on excessive optimism while sub-section (iv) had

statements on accounting information. The questionnaires were distributed using the drop and pick later method. To ascertain that the questionnaires were valid and reliable, a pilot study was conducted on investors who did not take part in the study.

3.5.1 Validity and Reliability

Reliability is an assessment of the extent to which a research tool yields consistent outcomes or data after administering it several times. Reliability in a research is influenced by random error. Random error is the deviation from the true measurement caused by inaccurate coding, lack of clear directions to the respondents, interviewer's fatigue. Random error will always exist regardless of the procedure used in a study. Validity is the scale to which outcomes obtained the data analysis represents the circumstances under investigation. Validity addresses the accuracy of the data obtained in the study representing the variables of the study and that the data is a true reflection of the variables under study. Validity is largely determined by the presence or absence of systematic error or non-random error in data. Validity is a matter of degree as no data can have a perfect validity.

3.6 Data Analysis

The study involved both quantitative and qualitative data. It examined the collected data to make inferences; editing to eliminate restatements, erraticness and for grouping. After the data was checked for wholeness and readiness for analysis, it was thematically coded. The refined quantitative data was analyzed using descriptive statistics involving frequencies, percentages, mean and standard deviation.

3.6.1 Analytical Model

The Regression equation was modeled as follows;

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Study Variable	Proxy	Operational Definition	Measurement	Academic Source
Investment Decision	Y	choice to postpone consumption and defer it to a future date	Expected Returns	Razek (2011) Agrawal (2012)
Overconfidence	X_1	overestimation of the probabilities for a set of events	Ordinal Likert Scale (1-5)	Hirshleifer & Subrahmanyam (1998),
Herding effect	X_2	tendency of investors to follow others people's actions	Ordinal Likert Scale (1-5)	Caparrelli *et al*., (2014), Hsu and Shiu (2010)
Excessive Optimism	X_3	individuals' belief that negative events are unlikely to happen to them compared to others	Ordinal Likert Scale (1-5)	Robinson (2007), Shefrin, (2007)
Accounting Information	X_4	past performance of a company	Ordinal Likert Scale (1-5)	Thaler, (2011), Ramnath *et al*. (2008)

Table 3.1 Operationalization of Variables

3.6.2 Test of Significance

T-test was used to determine a possible relationship between the dependent variable and each independent variable in isolation.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND INTERPRETATION

4.1 Introduction

This study sought to examine the effect of cognitive biases on retail investment decisions at the Nairobi Securities Exchange. The findings of the analysis of the Effect of Cognitive Biases on retail Investment Decisions at the Nairobi Securities Exchange are presented in this chapter.

4.1.1 Validity and Reliability

In order to ensure the validity of the questionnaire, it was availed to peers who helped establish its content and construct validity to ensure that the items were adequately representative of the study subject.

Data was cleaned before coding in order to minimize errors. Reliability of the survey instrument was estimated using Cronbach's Alpha Coefficient which accepts a reliability of at least 0.70 at $\alpha = 0.05$ significance level of confidence. The questionnaire had a reliability of 0.717 and was thus reliable for data collection.

4.2 Response Rate

The study targeted 96 investors taken from the 21 brokerage firms operating in Kenya. Probability sampling technique was adopted to randomly select the 96 respondents. A respondent was selected from customers being served in a brokerage firm in a given day. Out of the 96 questionnaires distributed, only 66 were fully completed contributing to an aggregate response rate of 68.8% as illustrated on Table 4.3. This response rate was sufficient, representative and adequate for analysis and reporting (Mugenda & Mugenda 2003).

Table 4.2 Response Rate

Response	Frequency	Percentage
Responses received	66	68.8%
No responses	30	31.2%
Total	**96**	**100%**

Source: Researcher, 2017

4.3 Demographic Information

In order to increase dependability of the respondents' information, their background information i.e. age of the respondents, gender, highest level of education and the number of years they had been investors at the NSE were established.

4.3.1 Age of the respondents

The study aimed to establish the age of the respondents. The findings were as shown on Table 4.4.

Table 4.3: Age of the respondents

Age of respondents	Frequency	Percent
18-25 years	5	7.6%
26-30 years	9	13.6%
31-35 years	11	16.7%
36-40 years	18	27.3%
over 40 years	23	34.8%
Total	**66**	**100%**

Source: Research Findings

The study found that 34.8 % of the investors at the NSE were aged over 40 years, 27.3% were aged 36-40 years, 16.7% were aged 31-35, 13.6% were aged 26-30 years, while 7.6% were aged 18-25 years. This implied that all the investors at the NSE were aged above 18 years and were therefore suitable respondents for the study.

4.3.2 Gender of the Investors

The study sought to establish the investors' distribution by gender. The findings were as shown on Table 4.5

Table 4.4: **Gender of the Investors**

Gender	Frequency	Percentage
Male	65	68%
Female	31	32%

Total	**96**	**100%**

Source: Research Findings

The study established that majority (68%) of the investors were male while (32%) were female as illustrated in Figure 4.2 above. This implied that most of the investors in the NSE were male, thus there was no gender parity among the investors.

4.3.3 Level of education attained by the Investors

The study sought the highest level of education attained by investors and the findings are as shown on Table 4.6

Table 4.5 Level of education attained by the Investors

Level of education	Frequency	Percent
Graduate	44	46%
College Diploma	23	24%
Other	24	25%
High School	5	5%
Total	**66**	**100%**

Source: Research Findings

The study findings were that 46% of the investors were graduates, 25% had 'other' qualifications, 24% had college diploma and 5% had high school qualifications. This depicts that the investors were reasonably educated thus they were suitable respondents for the study.

4.4 Descriptive Statistics

The researcher used frequencies and percentages, mean and standard deviation in order to meaningfully describe the findings of the study as shown in the following sub-headings:

4.4.1 Investment Decisions

The study sought to find out the investment decisions that the investors made. This was made possible through finding out the volume of shares held, expected returns and duration of time the shares had been held.

4.4.1.1 Volume of Shares Held

The study sought to find out the volume of shares held by the retail investors. The various firms' shares were consolidated into main 5 categories as shown on Table 4.7.

Table 4.6 Volume of shares held

	Frequency	**Percent**
Banking	16	24%
Manufacturing and Allied	14	21%
Commercial and Services	6	9%
Investment	19	29%
Telecom and Technology	11	17%
Total	**66**	**100%**

Source: Research Findings

The findings indicated that 29% had shares in the investment sector, 24% of the investors had shares in the Banking sector, 21% had shares in the manufacturing and

Allied sector, 17% had shares in in the Telecom and Technology sector while 9% had shares in commercial and services sector. This was an indication that different investors at the NSE preferred investing in some sectors as opposed to others.

4.4.1.2 Expected Returns in Each Sector

The study sought to establish the returns the investors expected. The findings were aggregated as shown on Table 4.8

Table 4.7 Expected Returns

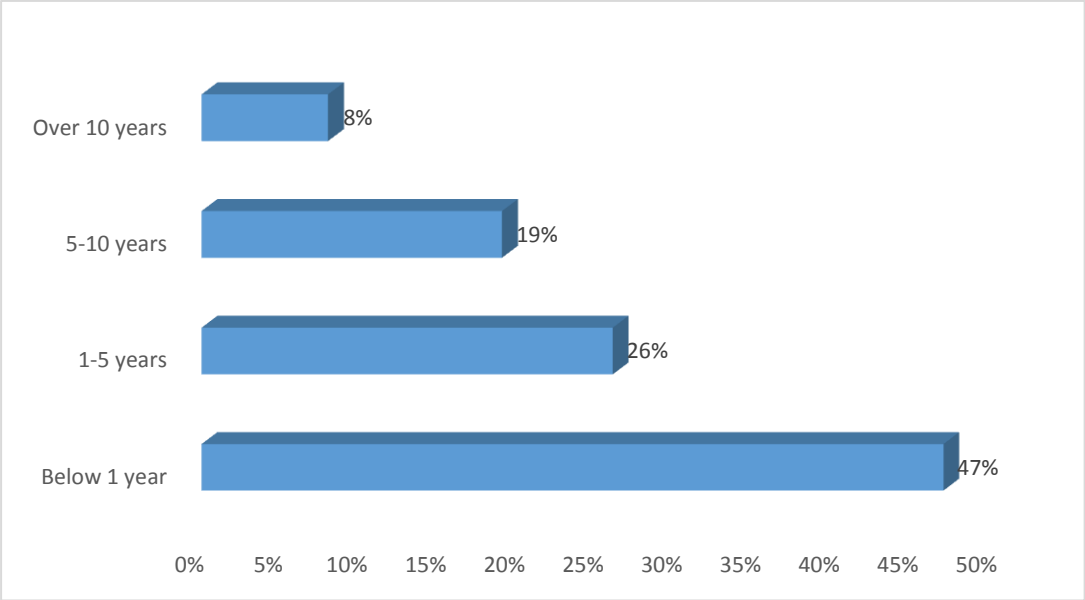
	Frequency	**Percentage**
1-10%	12	18%
11-30%	11	17%
31-50%	32	48%
Over 50%	11	17%
Total	**66**	**100%**

The study established that 48% of the investors expected 31-50% return from their investment, 18% expected 1-10% returns, 17% expected 11-30% returns while 17% expected over 50% returns from the stocks they invested in. This implied that a large number of investors expected 31-50% return on their stocks.

4.4.1.3 Duration of Time the Stocks Have Been Held

The study sought to establish the duration of time the investors had held their stocks. The findings were as shown on Figure 4.1.

Figure 4.2 Duration of time the stocks had been held



Source: Research Findings

The study established that 47% of the investors had held stocks for under over 1year, 26% for between 1-5 years 19% for 5-10 years while 8% had held stocks for over 10 years. This depicted that the investors were mainly short term investors.

4.4.2 Cognitive Biases

The study sought to find out the cognitive biases held by the retail investors in the NSE. The findings were as discussed in the following sub-sections.

4.4.2.1 Overconfidence

In order to find out whether there was influence of overconfidence bias among investors, they were required to indicate their level of agreement with certain statements. Their responses were rated on a five point Likert scale where: 1=Strongly Disagree 2=Somehow Disagree 3=Agree 4=Somehow Agree and 5=Strongly Agree. SPSS was used for generating the standard deviation and mean as illustrated on Table 4.10. A mean range of 1-3 would mean little influence while 3-5 would mean great influence.

Table 4.8 Opinion on influence of overconfidence Bias

Opinion on overconfidence bias	Mean	Std. Dev.
I make all the important share investment decisions myself	4.0000	1.22788
I am more knowledgeable in share investments compared to the ordinary investor	3.9091	1.23696
I believe that my skills and knowledge of the stock market can help me to outperform the market	3.8636	1.40205
I take the least time possible to analyze and rely on available market statistics	3.8939	1.34883
I feel I have the ability to manipulate the investments in my favour	3.7576	1.42570
I feel I am experienced enough to forecast the winning investments	3.6818	1.13895

Source: Research Findings

The study established that overconfidence bias had a significant influence on the retail investment decisions. The investors were in agreement that they made all the important share investment decisions themselves (Mean 4.0000), they were knowledgeable in share investments in comparison with ordinary investors (Mean 3.9091), they took the least time in analyzing the available market statistics (Mean 3.8939), they believed in their skills and knowledge of the stock market to outperform the market (Mean 3.8636).

They felt that they could manipulate investments to favour them (Mean 3.7576), they felt that they had the necessary experienced for forecasting the winning investments (Mean 3.6818). This implied that majority of the investors believed in their abilities in matters regarding investment which was an indication of overconfidence bias.

4.4.2.2 Herding Effect

In order to find out whether there was influence of herding effect bias among investors, they were required to indicate their level of agreement with certain statements. Their responses were rated on a five point Likert scale where: 1=Strongly Disagree 2=Somehow Disagree 3=Agree 4=Somehow Agree and 5=Strongly Agree. SPSS was used for generation of standard deviation and mean as illustrated on Table 4.11. A mean range of 1-3 would mean little influence while 3-5 would mean great influence.

Table 4.9 Opinion on influence of herding effect bias

Opinion on influence of herding effect bias	Mean	Std. Dev.
When I need to make decision to buy/sell stocks in a short time, following most investors' behaviors is fast and certain method	4.3182	.63631
Information from relatives, friends and colleagues has high reliability.	4.1061	.74687
I gather information about transactions of foreign investors	4.1212	.77490
I get recommendations of analysts, market researchers and stock brokers	4.1364	.78223
I always rush for the 'hottest' investment	4.1212	.81364
Investing in stocks where everyone else is investing is less risky	4.1515	.80846

Source: Research Findings

The study established that herding effect had a significant influence on retail investor decisions The investors were in agreement that when they needed to decide to buy/sell stocks in a short time, they followed the behaviors of most investors (Mean 4.3182), investing in stocks where everyone else is investing is less risky (Mean 4.1515), they get recommendations of analysts, market researchers and stock brokers (Mean 4.1364), they gathered information about transactions of foreign investors

(Mean 4.1212), they always rush for the 'hottest' investment (Mean 4.1212) and they relied on information from relatives, friends and colleagues (Mean 4.1061) respectively. This implied that majority of the investors attached a lot of importance to others' opinions regarding the market which was an indication of herding effect bias.

4.4.2.3 Excessive Optimism

In order to find out whether there was influence of Excessive Optimism bias among investors, they were required to indicate their level of agreement with certain statements. Their responses were rated on a five point Likert scale where: 1=Strongly Disagree 2=Somehow Disagree 3=Agree 4=Somehow Agree and 5=Strongly Agree. SPSS was used for generation of standard deviation and mean as illustrated on Table 4.12 below. A mean range of 1-3 would mean little influence while 3-5 would mean great influence.

Table 4.10 Opinion on influence of Excessive Optimism

Opinion on influence of excessive optimism	Mean	Std. Dev.
I use predictive skills to time and outperform the market	4.1970	.80803
I am optimistic on stock returns beyond market expectations	3.9394	.82048
I ignore the connection between different investment possibilities	4.0758	.80976
Most stocks are overvalued in comparison with their actual prices.	4.0909	.77910
There may be a generally rapid decline in the stock prices	4.2424	.74546
Eventually the stock prices will come down and that will be the best time to invest	4.3182	.63631

Source: Research Findings

The study established that Excessive optimism had a significant influence on retail investor decisions. The investors were in agreement to a great extent that eventually the stock prices will come down and that will be the best time to invest (Mean 4.3182), there may be a generally rapid decline in the stock prices (Mean 4.2424), they use predictive skills to time and outperform the market (Mean 4.1970), most stocks are overvalued in comparison with their actual prices (Mean 4.0909), they ignored the connection between different investment possibilities (Mean 4.0758) and they were optimistic on stock returns beyond market expectations (Mean 3.9394). This depicted that they depended on optimism and predictive skills when investing which were indicative of excessive optimism bias.

4.4.2.4 Accounting Information

In order to find out whether there was influence of Accounting Information bias among investors, they were required to indicate their level of agreement with certain statements. Their responses were rated on a five point Likert scale where: 1=Strongly Disagree 2=Somehow Disagree 3=Agree 4=Somehow Agree and 5=Strongly Agree. SPSS was used for generation of standard deviation and mean as illustrated on Table 4.13. A mean range of 1-3 would mean little influence while 3-5 would mean great influence.

Table 4.11 Opinion on influence of Accounting Information

Opinion on influence of accounting information	Mean	Std. Dev.
I tend to treat each element/account in my investment portfolio separately	4.1212	.81364
I am willing to sell a losing investment because the account shows a loss	4.2273	.73997
Market information is important for my personal investment in the NSE	4.1061	.80630
Information on my investment books of accounts is important for my investment decision	4.1515	.82727
There is a relationship between financial statements of firms and their share price in the stock market	4.4091	.72276

Source: Research Findings

The study established that accounting information had a significant influence on retail investor decisions. The investors were in agreement that there is a relationship between financial statements of firms and their share price in the stock market (Mean 4.4091), they were willing to sell a losing investment because the account shows a loss (Mean 4.2273), information on my investment books of accounts is important for my investment decision (Mean 4.1515), they tended to treat each element/account in my investment portfolio separately (Mean 4.1212) and market information was important for their personal investing in the NSE (Mean 4.1061).

This implied that the investors were keen on individual shares rather than the general portfolio and they would consider it as an entity based on the market information. These were all aspects of accounting information bias.

4.5 Inferential Statistics

In order to assess the relationship between the study variables, a regression analysis was conducted and the results were as follows:

4.5.1 Model Summary

Coefficient of determination (R square) explains the percentage of variation in the dependent variable that is influenced by the independent variables. The four independent variables studied (that is Overconfidence, Herding effect, Excessive optimism and Accounting information), explain 77.79% of variance in retail investment decisions as represented by the R^2. Thus other factors not part of this study contributed 22.21% of variance in the dependent variable.

Table 4.12 Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.882	0.7779	0.756	0.0221

a. Predictors: (Constant), overconfidence, herding effect, excessive optimism and accounting information

b. Dependent Variable: Retail investment decision

4.5.2 Analysis of Variance

Analysis of Variance (ANOVA) consists of calculations that provide information about levels of variability within a regression model and forms the basis for tests of significance.

Table 4.13 ANOVA (Analysis of Variance)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.768	4	3.192	7.32	.012[a]
	Residual	24.332	59	0.436		
	Total	37.1	63			

a. Predictors: (Constant), overconfidence, herding effect, excessive optimism and accounting information

b. Dependent Variable: Retail investment decision

Source: Research Findings

From the study findings in Table 4.8, the significance value is 0.012 which is less than 0.05, thus the model was statistically significant in predicting how overconfidence, herding effect, excessive optimism and accounting information influence the retail investment decisions in the Nairobi Securities exchange. An F-test measures the F-distribution. It is used when comparing statistical models that have been fitted to a data set, to identify the model that best fits the population from which the data were sampled. The F statistic in this study was significant (as it was =7.32) and this showed that the model had a good fit.

Table 4.14: Coefficient of Correlation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.182	.826		7.484	0.0000
	Herding effect	0.742	.278	0.146	2.669	0. 0110
	Overconfidence	0.815	.289	0.126	2.820	0.0075
	Excessive optimism	0.567	.234	0.045	2.423	0. 0201
	Accounting information	0.476	.205	0.142	2.322	0.0255

Source: Research Findings

Therefore; substituting the regression model $Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Becomes: $Y = 6.182 + 0.742X_1 + 0.815X_2 + 0.567X_3 + 0.476X_4 + \varepsilon$

According to the equation, taking all factors (overconfidence, herding effect, excessive optimism and accounting information) constant at zero, retail investment decisions will be 4.478. The study also discovered a significant positive relationship between Herding effect bias and retail investment decision (β=0.742 and P value < 0.05); meaning that a unit increase in herding effect bias leads to an increase in retail investment decision by 0.742. The study also discovered a significant positive relationship between Overconfidence bias and retail investment decision (β=0.815 and P value < 0.05); meaning that a unit increase in overconfidence bias leads to an increase in retail investment decision by 0.815.

The study further discovered a significant positive relationship between Excessive optimism bias and retail investment decision (β=0.567 and P value < 0.05); meaning that a unit increase in Excessive optimism bias would lead to an increase in retail investment decision by 0.567.

Finally the study discovered a significant positive relationship between Accounting information bias and retail investment decision (β=0.476 and P value < 0.05); meaning that a unit increase in Accounting information bias would lead to an increase in retail investment decision by 0.476.

4.6 Discussion of Findings

From the regression table above, the most significant variable was overconfidence (β=0.815), followed by herding behaviour (β=0.742), then excessive optimism (β=0.567) while accounting information was the least significant variable (β=0.476).

The study endeavored to establish the effect of cognitive biases on retail investment decisions at the Nairobi Securities Exchange. This was assessed by use of primary data and its analysis based on the study variables.

The study discovered that overconfidence bias had the most significant influence on the retail investor decisions in that majority of the investors believed in their knowledge and experience in the stock market and their ability to manipulate the investments in their favour. This is supported by Agrawal (2012) who argues that overconfidence affects the behavior of both the secondary and primary market traders. People will always tend to be biased and therefore overestimate their ability to forecast the market trends. Overconfidence develops partly from the illusion of knowledge. The human mind is designed to obtain as much information as it can from any environment it finds itself in.

Further, Akintoye (2006) argues that people remain overconfident in spite of failures as they can always forget their failures while remembering their successes at will and then emphasize future plans and disregard past failures. Overconfidence is usually manifested in a stock market through excessive trading. (Loungand Ha, 2011) argue that when a particular portfolio dominates others, there is no regard to the past disappointing performance of it in many actively managed funds.

According to the study findings, herding effect had a significant influence on retail investment decisions in that that majority of the investors attached a lot of importance to relatives' and others investors' opinions regarding the market. This agrees with the argument by Caparrelli*et al*. (2014) who posit that herding investors are usually driven by the masses' decisions of buying or selling stocks. This is however contrasted with the rational investors, who are mostly informed and therefore ignore following the masses. This in effect makes the market efficient. Herding shakes the market and makes it inefficient usually characterized by speculative bubbles. In general, herding investors are comparable to prehistoric men who were not knowledgeable in matters investment and therefore lived in groups and they used to support one another in times of need especially protection from attacks by wild animals (Caparrelli*et al*., 2014).

The study findings revealed that excessive optimism had a significant influence on retail investment decisions in that investors were optimistic on stock returns beyond market expectations, they used predictive skills to time and outperform the market and they ignored the connection between different investment possibilities. These were indications of excessive optimism. This is in agreement with Shefrin (2007) who posits that excessive optimism happens when individuals overrate the

occurrence of favorable results and underrating the occurrence of unfavorable results. For instance people undervalue the possibility of getting a divorce or even getting a bad illness they always focus on having good health and living more than other and having having great and talented children (Shefrin, 2007). Also, ZhaoyangGu, (2007) supports this view and argues that individuals are likely to react excessively to the positive information and under react to the negative information.

The study findings revealed that accounting information had a significant influence on retail investment decisions in that the investors were willing to sell a losing investment because the account showed a loss, they tended to treat each element/account in their investment portfolio separately and market information was important for their personal investing in the NSE which were all measures of accounting information. The findings agree with Merika (2008) and Easley (2010) who posit that financial information and the anticipated firm returns do have an important influence on the decision to invest in shares.

Easley and O'Hara, (2010) indicated that when creating a target to invest, people normally start with examining the firm's position of finance based on a few aims that include earning per share and returns on equity. Afterwards, their emotional thoughts of the evaluations come to affect and try to defend their decisions on investing in a given firm stock.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Discussed in this chapter are the summary of the study, conclusion and the recommendations under the following sub- headings.

5.2 Summary

From the study, majority of the investors believed in their abilities and knowledge in matters regarding investment, they felt they were knowledgeable in share investments in comparison with ordinary investors and they took the least time in analyzing the available market statistics. These were all indicators of overconfidence bias. There was also a significant positive relationship between overconfidence and retail investment decisions at the NSE.

According to the study findings, investors gathered information about transactions of foreign investors and they always rushed for the 'hottest' investment, when they needed to decide to buy/sell stocks in a short time, they followed the behaviors of most investors, they also agreed that investing in stocks where everyone else is investing is less risky and they always got recommendations of analysts, market researchers and stock brokers. Therefore, they were influenced by the herding bias during investment. Herding also had a significant positive relationship on the retail investment decisions at the NSE.

The study found that most investors at the NSE were optimistic on stock returns beyond market expectations, they used predictive skills to time and outperform the market. They also believed that eventually the stock prices would come down and

that would be the best time to invest, also there may be a generally rapid decline in the stock prices. This were signs of excessive optimism. There was also a significant positive relationship between excessive optimism and retail investment decisions at the NSE.

According to the study findings, investors agreed that there was a relationship between financial statements of firms and their share price in the stock market, they were willing to sell a losing investment because the account showed a loss, they treated each account as a separate entity in their portfolio separately and market information was important for their personal investing in the NSE. Accounting information had a significant positive relationship on retail investment decisions at the NSE.

5.3 Conclusions

This study concludes that investor decisions are not rational but are influenced by behavioural biases. These biases are manifested in different forms. The factors that were most prevalent among retail investors manifested in the form of overconfidence where investors overestimated their skills and knowledge in making investment decisions. They also believed that they were knowledgeable in share investments in comparison with ordinary investors and they took the least time in analyzing the available market statistics.

Herding behaviour also affected investors as they were reportedly following the crowd. They purported to gather information about transactions of foreign investors and rushing for the ‘hottest’ investment. When they needed to decide to buy/sell stocks in a short time, they followed the behaviors of most investors, they also

agreed that investing in stocks where everyone else was investing was less risky and they always got recommendations of analysts, market researchers and stock brokers.

Similarly, retail investors were also affected by excessive optimism bias in that, to time and outperform the market, they used their predictive skills. They were optimistic on stock returns beyond market expectations. They also believed that eventually the stock prices would come down and that would be the best time to invest, also there may be a generally rapid decline in the stock prices.

Finally, investor decisions were also influenced by accounting information through treating each account in their investment portfolios separately and acquiring market information before investing in a particular stock. They also agreed that there was a relationship between financial statements of firms and their share price in the stock market, they were willing to sell a losing investment because the account showed a loss.

5.4 Recommendations for Policy and Practice

Since behavioural biases influence investor decisions, this study recommends that retail investors be provided with investment education to lessen the effects of these biases so that existing and potential investors make rational decisions when investing. This will minimize the errors in decisions while ensuring that such investors reap maximum benefits from their investments at the Nairobi Securities Exchange.

The study also recommends that retail investors seek for knowledge from their fund managers before they commit money in particular stocks. Fund managers are knowledgeable in the area of investing and their accumulated experience will no doubt be of value to investors, especially those without experience in matters of

investment. This will ensure that they put money in stocks that are likely to yield returns. This is because they will rely on trends and facts rather than optimism in the course of investment.

The NSE should also initiate investor education programs for potential and existing investors so they understand the happenings in the stock exchange which would guide proper investment. All that most investors in the NSE have is money. They have no clue of how the stock market operates while the traders are out to make money. These exposes the uninformed traders and they fall back to the biases to guide their decisions. Investor education would greatly help these investors.

Related to the above recommendation, the Capital Markets Authority as the regulator should track rogue brokers and or fund managers who may want to take advantage of uninformed investors by charging them a lot of money in exchange for market information. These brokers are out to make quick money from the ignorant investors and therefore CMA should always track the happenings at the NSE in order to root them out.

5.5 Limitations of the Study

The study used primary data (questionnaires) which can be general and vague. Such information may not specific enough to really help retailers make decisions on investment. The information and data may not be very accurate as this depended on the honesty of the respondents. Again the responses may have an element of subjectivity as there was no way of authenticating the information provided.

Findings from this study may not be conclusive as the study centered on only four determinants of retail investment decisions. The Nairobi Securities Exchange is a large market that may be influenced by many other external factors and not

necessarily those envisaged by this study. Like every other market the forces of demand and supply may also influence trading decisions over and above the biases.

Also, availability of data determined the variables of the study. Therefore there was no probability criterion employed to pick on those variables. Even with the chosen variables not all the targeted respondents provided the required information. This means that any attempt to generalize the study findings ought to be approached with a lot of caution.

5.6 Suggestions for further Research

Since this study focused on the retail investors based in Nairobi, similar studies may also need to be carried out outside the Nairobi Securities Exchange for purposes of generalization. Such a study may need to focus on the investors being served at the various branches of the stock brokerage firms spread all over the country. Results from such a study may be useful in finding out whether an urban setting could also be responsible for the biases identified in this study.

Again this study focused on the retail investors at the NSE. Similar studies may be conducted on the effect of cognitive biases on corporate investment decisions at the NSE. It would be interesting to find out whether the biases identified among retail investors could also affect the corporate investors. Again we may want to find out whether the corporate investors who are said to have better knowledge of the securities market are also influenced by biases.

Similar studies may be done at the NSE but employing a larger sample for comparison purposes. The sample size for this study was 96 investors. Other studies may need to find out whether having a larger sample size may fundamentally alter

the findings of the current study while employing secondary data or mixed approaches in data collection in order to minimize subjectivity of the study.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Section A: General Information

1) What is your age bracket?

18-25 years ( ) 26-30 years ( ) 31-35 years ( ) 36-40 years ( ) over 40 years ( )

2) Please state your gender

Male ( ) female ( )

3) What is your highest level of education?

Graduate ( ) College diploma ( ) High school ( ) Other ( )

4) For how many years have you been investing/trading shares on the NSE?

Below 5 years ( ) 5-10 years ( ) Over 10 years ( )

Section B: Investment Decisions

5) Please tick the investment sectors in which you hold stocks and indicate volume of shares held, expected return and duration.

Sector	**Tick**	**Volume of shares held**	**Expected Returns**	**Duration held**
Agricultural Sector				
Commercial and Services				
Banking				
Manufacturing and Allied				
Construction and Allied				
Energy and Petroleum				

Investment				
Growth Enterprise Market				
Telcom and Technology				
Insurance				

Section C: Cognitive Biases

Please evaluate the degree of your agreement with the following statements. Use a scale of 1-5 where 1= Strongly Disagree 2=Somehow Disagree 3=Agree 4=Somehow Agree and 5=Strongly Agree

Overconfidence	**1**	**2**	**3**	**4**	**5**
I make all the important share investment decisions myself.					
I am more knowledgeable in share investments compared to the ordinary investor					
I believe that my skills and knowledge of the stock market can help me to outperform the market					
I take the least time possible to analyze and rely on available market statistics					
I feel I have the ability enough to manipulate the investments in my favour					
I feel I am experienced enough to forecast the winning investments					

Herding Effect	**1**	**2**	**3**	**4**	**5**
When I need to make decision to buy/sell stocks in a short time, following most investors' behaviors is fast and certain method					
Information from relatives, friends and colleagues has high reliability.					
I gather information about transactions of foreign investors					
I get recommendations of analysts, market researchers and stock brokers					
I always rush for the 'hottest' investment					
Investing in stocks where everyone else is investing is less risky					

Accounting Information	**1**	**2**	**3**	**4**	**5**
I tend to treat each element/account in my investment portfolio separately					
I am willing to sell a losing investment because the account shows a loss					
Market information is important for my personal investment in the NSE					
Information on my investment books of accounts is					

important for my investment decision					
There is a relationship between financial statements of firms and their share price in the stock market					

Excessive Optimism	**1**	**2**	**3**	**4**	**5**
I use predictive skills to time and outperform the market					
I am optimistic on stock returns beyond market expectations					
I ignore the connection between different investment possibilities					
Most stocks are overvalued in comparison with their actual prices.					
There may be a generally rapid decline in the stock prices					
Eventually the stock prices will come down and that will be the best time to invest					

APPENDIX II: LIST OF REGISTERED BROKERAGE FIRMS IN KENYA

1. ABC Capital
2. African Alliance Kenya Investment Bank
3. Afrika Investment Bank
4. ApexAfrica Capital
5. CBA Capital
6. Discount Securities
7. Dyer & Blair Investment Bank
8. Equity Investment Bank
9. Faida Investment Bank
10. Francis Drummond & Company
11. Genghis Capital
12. Kestrel Capital
13. Kingdom Securities
14. Ngenye Kariuki& Co
15. NIC Securities
16. Old Mutual Securities
17. Renaissance Capital (Kenya)
18. SBG Securities
19. Standard Investment Bank
20. Sterling Capital
21. Suntra Investment Bank

Source :www.nse.co.ke

APPENDIX III: FIRMS LISTED IN THE NSE

1. Eaagads Ltd
2. Kapchorua Tea Co. Ltd
3. Kakuzi
4. Limuru Tea Co. Ltd
5. Rea Vipingo
6. Sasini Ltd
7. Williamson Tea Kenya Ltd
8. Car and General (K) Ltd
9. Sameer Africa Ltd
10. Marshalls (E.A.) Ltd
11. Barclays Bank Ltd
12. CFC Stanbic Holdings Ltd
13. I&M Holdings Ltd
14. Diamond Trust Bank
15. HF Group Ltd
16. KCB Group Ltd
17. National Bank of Kenya
18. NIC Bank Ltd
19. Standard Chartered Bank
20. Equity Group Holdings
21. The Co-operative Bank
22. Express Ltd
23. Kenya Airways Ltd
24. Nation Media Group
25. Standard Group Ltd
26. TPS (Serena) Ltd
27. Scangroup Ltd
28. Uchumi Supermarket Ltd
29. Hutchings Biemer Ltd
30. Longhorn Publishers Ltd
31. Atlas Devt' and Support
32. Deacons (East Africa) Plc
33. Nairobi Business Ventures
34. Athi River Mining
35. Bamburi Cement Ltd
36. Crown Berger Ltd
37. E.A.Cables Ltd
38. E.A. Portland Cement Ltd
39. NSE
40. B.O.C Kenya Ltd
41. British American Tobacco
42. Carbacid Investments Ltd
43. African Breweries Ltd
44. Mumias Sugar Co. Ltd
45. Unga Group Ltd
46. Eveready East Africa Ltd
47. Kenya Orchards Ltd
48. A.Baumann CO Ltd
49. Flame Tree Group
50. Safaricom Ltd
51. Stanlib Fahari I-REIT
52. KenolKobil Ltd
53. Total Kenya Ltd
54. KenGen Ltd
55. Kenya Power & Lighting
56. Umeme Ltd
57. Jubilee Holdings Ltd
58. Sanlam Kenya PLC
59. Kenya Re-Insurance
60. Liberty Kenya Holdings
61. Britam Holdings Ltd
62. CIC Insurance Group Ltd
63. Olympia Capital Holdings
64. Centum Investment Co Ltd
65. Trans-Century Ltd
66. Home Afrika Ltd
67. Kurwitu Ventures

EFFECT OF COGNITIVE BIASES ON INVESTMENT DECISIONS AMONG RETAIL INVESTORS AT THE NAIROBI SECURITIES EXCHANGE

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