

**THE EFFECT OF BEHAVIOURAL BIASES ON INDIVIDUAL INVESTMENT
DECISIONS AT THE NAIROBI SECURITIES EXCHANGE**

BY

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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This research project has been submitted for examination with our approval as the University Supervisor.

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DEDICATION

To my parents, Joel and Jane Kimani and my siblings who gave me and has continued to give me all the support, hope and encouragement to complete this program.

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LIST OF ABBREVIATIONS

CAPM	Capital Asset Pricing Model
EMH	Efficient Market Hypothesis
IPO	Initial Public Offer
MPT	Modern Portfolio Theory
NSE	Nairobi Securities Exchange

ABSTRACT

The general objective of the study was to establish the effect of behavioral biases on the individual investment decisions of individual investors who trade at the Nairobi Securities Exchange. Descriptive statistics and inferential statistics were used to analyze the data with the aid of SPSS. The researcher administered 385 semi-structured questionnaires to individual investors who traded at the Nairobi Securities Exchange and received 308 properly filled questionnaires giving response rate of 80% and a none response of 20%. The study concluded that there was a strong relationship ($R\text{-value} = 0.729$) between behavioral biases (herding bias, overconfidence bias, representativeness bias and mental accounting bias) and individual investment decisions of individual investors who trade at the Nairobi Securities Exchange. The Adjusted R Square value of 0.525 revealed that behavioral biases can explain 52.5% of the total variance in the individual investment decisions of individual investors who trade at the NSE. The study also concluded that herding bias and overconfidence bias have a negative and statistically significant effect on individual investment decision making while representative bias and mental accounting bias had a positive and statistically significant effect on individual investment decision making. This implied that increasing herding bias and overconfidence bias would reduce the quality of individual investment decision making while representative bias and mental accounting bias would improve the quality of individual investment decision making in a statistically significant manner. The study recommends that individual investors who trade at the Nairobi Securities Exchange should take time to analyze stock movements rationally since herding bias and overconfidence bias have a negative and statistically significant effect on their investment decision they make hence resulting to more losses. Some of the respondents were reluctant had fear of the information being used for other reasons hence hesitant to fill the questionnaires. However, the researcher assured the respondents that the information they provide would be treated with utmost confidentiality and would only be used to fulfill academic requirements. The respondents being investors trading at the Nairobi Securities Exchange had busy working schedules which made the data collection process tedious and slow. The researcher used drop-and-pick-later method to give the respondents ample time to fill the questionnaires. The scope of this study was limited to the effects of behavioural biases on individual investment decisions at the Nairobi Securities Exchange. This implies that the findings cannot be adequately applied to non-behavioural factors that influence the individual investment decisions making of individual investors who trade at the Nairobi Securities Exchange. In future, a similar study should be done focusing on non-behavioural factors and effects of behavioural biases on other areas of investment other than securities.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Shefrin (2007) indicates that behavioural finance is a fast growing field that deals with the aspects of psychology and their effect on the conduct of financial professionals. Own investments behaviors are affected by the decisions of buying of small items of securities of own relation. Regardless of the amount of how much information an investor has about a particular stock, carried out due diligence or analyzed about a certain stock prior to putting money in it, he always has the fear of loss in the future. Investor behavior is influenced by varying factors leading to their irrationality. An individual investor is defined as one who purchases usually a little quantity of securities for their own (Nofsinger & Richard, 2012). Behavioral finance acknowledges that individual investors apply their psychological knowledge in making investment decisions. Various rules of thumb are applied in such investment decision making processes (Sewell, 2005).

The current study was based various finance theories. Modern portfolio theory (MPT) which serves as basis for growth and evolution of standard finance models that explain the tradeoff between risk and return, correlation and diversification of investments in portfolio development. The theory assumes rational investors prefer lower risk investment opportunities to higher level risks for a given return. It is on this basis that the finance models such as Efficient Market Hypothesis (EMH) and Capital Asset Pricing Model (CAPM) are founded on the assumption of individual rationality and consistent beliefs. Ritter (2003) confirms that the Efficient Market Hypothesis assumes rationality in the market and the information in the market provides a fair future market forecasts. In contrast, behavioral finance theory argues that in some instances the market information does not reflect the fair value of such markets since there exist inefficiencies as it is evidenced by the anomalies that

exist in the market. Behavioral finance further argues that the traditional finance theory ignores how real people make decisions. Prospect theory as proposed by Kahneman and Tversky (1979) describes the state of mind affecting an individual's decision-making processes and description on how people frame and make a decision that involves risk and uncertainty.

It is notable that many people have become aware of the trading at the NSE and are participating in trading. In the past Kenya market has witnessed tremendous increase of investors participating in Initial Public Offerings which has led to oversubscription of shares. However since many investors have the tendency of following masses and are overconfident, they end up enduring the pain and losses . According to Merika (2008), many investors in Kenya do not consult investment professionals or finance experts yet they continue to invest large sums of money in stocks.

1.1.1 Behavioral Biases

According to Barber and Odeon (1999), behavioral finance tries to lessen the traditional assumptions of financial economics of expected utility maximization of investors by including the noticeable and systematic human deviation from rationality into conventional theories of financial markets. This financial discipline puts into practice the use of models and beliefs in which market participants are not thought of as rational due to either their preferences or mistaken beliefs. Behavioral finance is based on human behaviors referred to as biases.

Behavioral finance is viewed in terms of how emotional traits affect the way in which individuals or groups of individuals make investment decisions, carry out investment analysis and manage their asset portfolios (Brown & Reilly, 2002). Raines and Leathers (2011), argue that people assess risks of alternative investments by use of given rules of thumb or past

experiences referred to heuristics, which decreases the complication of tasks of assessing probabilities and predicting values to simpler judgmental operations. Heuristics involves use of one's experience to answer questions or to improve performance. Shleifer (2000) notes that by incorporating psychology to finance, researchers focus on providing better explanation of features of securities markets and investor behavior that appear irrational which include loss aversion, cognitive dissonance, mental accounting, representativeness, anchoring, overconfidence and herding behavior.

Cognitive dissonance can be thought of as the uncomfortable distress that results from holding conflicting thoughts in the mind simultaneously. Festinger (1957) asserts that, people prefer maintaining their status quo and preserve the current understanding of a phenomenon through either turning down information, explaining away the new information, avoiding new information or by convincing themselves that there is no conflict between the new information and their current understanding (Chandra, 2008). The key characteristic of cognitive dissonance portrays that individuals change their beliefs to reduce the discomfort. This bias is based on three presumptions namely; people are somehow sensitive to the inconsistencies between actions and beliefs and; acknowledgment of such variations would cause dissonance and individual would react in different way in resolving the inconsistencies.

According to Kahneman and Tversky (1974), representativeness is the level to which an event resembles its population or the similarity between such event and its population. Investors make decisions based on stereotypes where they assume that shares in a good and well-managed company would be a good investment. Investors tend to trade in good performing stocks while they avoid stocks that could have had performed poorly in the past even if there are changes and new information in the market. Also they form judgments based on patterns that are rather simply random in a data and not representative of the facts since

the patterns may not even exist in the market. This behavior by investors explain the reason for investor overreaction in the market.

Anchoring also known as conservatism occurs when an investor makes use of past price or recent observations as a reference point for future investment decisions. According to Shiller (1998), prices of today are usually dictated merely by the past prices and investors give more weight on recent experiences with assumption or belief that recent prices portray the right position of the securities. It manifests itself when investors persist in the belief that the company is above average and will not react to sufficiently bad news.

Psychology studies have found that people tend to have inflated views of owns' abilities. This has been identified as a behavioral bias with Ritter (2003), noting that overconfidence is evidenced in situation where there is little diversification brought about by the tendency of investors investing too much to the securities they are familiar with. For example people would invest more in a local known company than in a foreign company. The same case applies to employees who buy shares of the company they work for irrespective of the security performance or new information in the market. Barber and Odean (2001) find it difficult to select common stocks that would perform well than others in the market as the predictability is low and the feedback might be noisy and notes investors are overconfident while selecting stocks to invest in. Overconfidence can be because of self-attribution bias where an investor will view a positive outcome as due to his ability and skills and view a negative outcome or bad results as bad luck or misfortune.

1.1.2 Individual Investment Decisions

According to Bodie et al, (2008), investment can be defined as committing of current assets with expectations of future reward and outcome. The reward or return depends on internal factors and characteristics such as investment type, management quality, and the means of

financing the investment as well as external opportunities available (Griffith, 1990). Investors have to balance between the expected return and the acceptable level of risk involved when making investment decisions. Nevertheless, they experience difficulties when making such long term financial decisions due to financial illiteracy and self-regulation (Winchester et al. 2011). There is therefore need for investors to have knowledge from investment professionals and experts who study market dynamics.

Many researchers have pointed out that the existing market inefficiencies cannot be explained with entirety by traditional financial theories, including abnormal movements of security prices during the IPO, mergers, and neglected firm effect (Johnson et al. 2002). The anomalies in the market provide evidence that the principal assumptions of rational behavior under the efficient market hypothesis are to some extent incorrect, and there is need therefore explore other theories that explain investors' behaviour in making investment decisions, as studied in other social sciences (Shiller, 1998).

In making investment decisions and choices, potential investors use various finance analysis tools including return on investment, cash flow analysis and break even analysis. However, investors make some decisions that seem to diverge and contradict from such tradition models. Anil (2013) agrees with behavioural theory on the basis that investors are not rational in making trading and investing decisions in the market, contrary to their beliefs and thoughts. Sawady and Tescher (2008), points out that various factors such as perceptions, beliefs and attitude intercept investors thinking process and end up affecting the ultimate investment decisions. .

1.1.3 Behavioral Biases and Individual Investment Decisions

Nofsinger and Richard, (2002) notes that, individual investment's behavior focuses on the choices they make on purchases of small quantities of securities for their own account. Sharpe, (1964) in modern portfolio theory argues that a rational investor would use diversification to maximize their portfolios. The theory bases the argument on diversification of assets, use of optimal portfolios, the securities and capital market lines. Traditional financial models assume that investors are efficient and will behave in a rational and always expected to make the best decisions for their own investments.

Fama (1970) theory of Efficient Market Hypothesis (EMH) support the rationality of investors and argues that securities are valued at their fundamental value, quickly respond to fresh information and offer high prices when good news are received and opposite when bad news come to market. Under EMH security prices are presumed to reflect all available information and prices would react almost immediately to new information to reflect the new value of stocks cash flows.

Making investment decisions is challenging to many investors. Personal and demographic factors such as level of education, age, and income contribute to an investor's decision making process .Investment decisions can also be technically derived from models of finance. Effective investment returns in market requires an understanding of human nature and the financial skills and situational factors that take into account the environment and the market psychology. Thus heuristic biases and rules of thumb should be given importance in the process of decision-making (Li, 2004).

1.1.4 Individual Investors at Nairobi Securities Exchange

Nairobi Securities Exchange (NSE) is the only organized stock market in Kenya. The organization started trading shares in 1920s on basis of gentlemen agreement without any physical trading . From then it has been advancing with time with creation of the capital market authority (CMA) and introduction of the central depository system as the current advancements. The NSE has 65 publicly listed companies trading in securities (Appendix II). In an ordinary trading day, both corporate and individual investors flock the NSE intending to sell and or buy securities from different firms listed there. They do this through the accredited brokerage firms. Individual investors form about 70% of the total transactions in the NSE (NSE, 2017).

Investors get overexcited and overreact especially when there are new securities in the markets and various factors influence their decision-making processes. At NSE, security price moves more than the fundamental market expectations as experienced during the Safaricom IPO where there was over-subscription. This can be explained through herding concept where many investors in Safaricom shares bought the stock due to mass influence and as such many people did not depend on the information in the market as argued by traditional theories of finance. It is also evident that individual investors continue trading in secondary market by purchase and selling of securities (CMA, 2017).

Over a short period of time, the NSE has seen continuous increase of companies applying to be registered for trading. This has attracted many individuals who are interested in investing as it was evident in repeated over-subscriptions for shares. However many investors have made losses due to herd behavior and overconfidence as it evidenced in Safaricom and Eveready Initial Public Offers (Ndiege, 2012).The current study intends to establish whether indeed behavioral biases influences individual investors decisions at the NSE.

1.2 Research Problem

There have been tremendous rises in the number of individual investors trading in Nairobi Securities Exchange. Investors have reacted positively to previous listing of companies in NSE as demonstrated through over-subscriptions of shares overtime. However, the investors suffer losses in one way, or another due to following of masses when subscribing for shares as it was experienced during NSE, KenGen, Safaricom, Scan group and Eveready Initial Public Offers.

It is argued that standard finance models have failed to explain market anomalies experienced although the traditional finance theorists were reluctant to accept the view of the psychologists. Its arguable then that individuals behave in a rational manner and are strictly guided by traditional finance in making decisions. It is evident from literature that heuristics or rule of thumb also contributes to the investment decision making by investors. The studies which have been carried out in Kenyan market have not sufficiently evaluated the effects of behavioral biases on investment decisions and the extent to which these aspects affect the investment decision at the NSE.

Girish and Kantesha (2014) in their study on the factors that influence individual investor in making decisions in the Indian Capital with a sample of 36 individual investors, identified seven such behavioral factors including; anchoring, risk aversion, information heuristics, overconfidence, disposition effect, representativeness and gamblers' fallacy. The findings for the study were intended to help stakeholders in understanding how investors behave and in formulation of financial products to meet and address psychological needs of the investors.

Chandra (2008) in his survey also seek to explore the impact of behavioral factors and investors' psychology on their investment decisions making and examined the relationship between investors attitude towards risk and behavioral decision making process. The findings

analyzed from secondary data, showed that unlike conventional finance theories, individual investors often don't make rational decisions but are rather affected by behavioral factors such as greed and fear, cognitive dissonance, mental accounting and anchoring.

A study by Obamuyi (2013) carried out in Nigeria Capital Market exhibited the most influencing factors on investors investment decision include past performance of the firm's securities, expected stock split, capital increases or bonus, dividend policy, expected corporate earnings and get-rich-quickly mindset. The same study identified the least influencers of investment decisions among them religion, rumors, loyalty to the company's products or services, opinions of members of the family and expected losses in other investments.

Abdulahi (2013) in his study on the effects of behavioral biases on investment decisions of individuals in Kenya sampled 30 respondents and found out that some behavioral factors like representativeness bias, illusion of control, herding bias were significantly correlated to the decisions of individual investors while other biases like loss aversion, regret aversion and over-optimism were not significantly affecting the outcomes. He concludes that due to lack of a common ground by financial scholars, behavioral finance concept is still open for debate and more research is needed.

Kimani (2011), in a local study of factors that influence individual investors' choices at NSE identified the main behavioral biases that are evidenced in the market include market prospect, overconfidence, herding, and anchoring bias. However, it was not clear whether individual investment decisions on IPOs trading were affected by behavioral biases.

In another study carried out to identify factors that affect the individual investment decisions by Vincent and Ambrose (2014), concluded that the main factors that have an influence on individual investment decisions include firm's reputation, the status of the firm within the

industry, expected performance of the organization, past performance, firms stock price per share, feeling on the economy and expected dividend. Though the study didn't find out any behavioral bias it is evident that individual investors would react differently to above factors.

Ratemo (2012) examined the effects of behavioral biases in Kisumu based investors and his findings attest that those behavioral biases are an important part of how investors make decisions and conclude on their investment choices. He further notes that not all investment decisions are reached at through rationality as expected if conventional finance models are applied. However, his study did not provide a conclusive position on the extent to which behavioral biases affected the investment decisions. Also, his study concentrated on Kisumu County.

Ndiritu (2012) also studied the effects of behavioral biases and frame dependence on real estate prices in Nairobi County and concluded that frame dependence and behavioral bias play a role in influencing investment decisions of real estate investors. This confirms that behavioral biases are not only present in securities trading but also in real estate. Of the most influencing factors they found out that herding and shadow of the past were positively correlated to real estate prices while mental accounting, narrow framing and behavioral portfolios were less significant.

From the above studies, its conclusively correct that there exist these factors that affect the investments decisions of individual investors. The researches generalized the factors and don't describe the variables in detail and show the extent to which one factor has more influence on the investment decisions than the other. More so the researches that have been done in Kenya have focused on a smaller sample of population. This study intends to answer the question how do the behavioural factors affect decisions and to bridge the gap that exist

between the behavioural factors and the extent to which they affect investment decisions on a developing country with focus on individual investors in Nairobi.

1.3 Objective of the Study

The objective of the study is to establish the effects of behavioral biases on individual investment decisions at the Nairobi Securities Exchange.

1.4 Value of the Study

This study will contribute to the general body of knowledge in the growing area of behavioural finance and provides more insight and knowledge. This study's findings were used as a reference by scholars, students and researchers who might want to undertake studies in the same field. The study helped both researchers and scholars in identifying research gap in this field which prompted and guide them in executing further studies.

The study is aimed to form part of reference point for policy makers like CMA and NSE management to be able to help understand the behaviour of investors and reduce any negative effect it might have on the security markets. The findings would be of value to financial advisors in identifying the different types of behavioural biases and their possible impact on effects on investment decisions among investors.

The findings of this study would assist investors and investment managers to understand the contribution of emotional biases toward investment decisions and form a self-evaluation basis for individuals who have already invested in securities and adjust accordingly. In practice, study will be of help to investors to understand the different psychological biases they can attribute themselves to and enable them to make credible investment decisions that are not affected largely by personal beliefs and emotions.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter provides an outline of the existing knowledge on behavioral finance and investment decisions. It includes the comparison between the traditional finance theories and the behavioral finance theories. The chapter concludes by looking at empirical studies and their literature review summations.

2.2 Theoretical Framework

Conventional finance is the body of knowledge that supports rationality and efficient markets which advocates that CAPM, EMH, modern portfolio theory and other rational financial theories are key ingredients on predicting and explaining certain financial events and decisions made by investors. However, new studies in both finance and economics supported by psychologists began to find market inconsistencies and behaviors that traditional finance theories could not explain. Though the standard theories could be used to explain certain perfect events, the markets are complex and not orderly portraying a gap in the traditional theories of finance. According to Samal (1995), investors have common needs for investments including wealth accumulation, tax efficiency, source of income, and life cover among others and their decisions are made based on these needs.

2.2.1 Efficient Market Hypothesis

An efficient market can be defined as a market where many rational investors come together and compete with a goal of profit maximization and prediction of future market values by using the available information in the market. Such information is assumed to be free and available to all participants at the same time. Developed by Eugene Fama (1970), EMH describe the role of capital markets to be that of ensuring efficient and effective allocation of title of the economy's capital stock. EMH is found on the basis that investors behave

rationally, intentionally maximizing returns and process all the available information efficiently, Shiller (1998). The hypothesis implies that it is not possible to outperform the market since any new information causes existing share prices to always adjust to incorporate and reflect all the relevant information hence maintaining the market efficiency at any given time (Fama, Fisher, Jensen and Roll, 1969).

The theory further argue that security prices reflect the fair value of such stocks on security exchanges, therefore investors would find it difficult to either purchase undervalued stocks or sell stocks for inflated prices. If stock were to be undervalued, all investors would shift counters, creating more demand. The forces of demand and supply will thus regularize the price to equilibrium. Fama, (1970) categorized market efficiency into three variants namely: weak form, semi-strong form and strong form of market efficiency. Weak form of efficiency assumes that prices on traded assets reflect all historical information. The semi-strong form of EMH asserts that securities prices reflect both past and present public information. The strong form implies that stock prices reflect both public and hidden insider information. It will follow consequently that the offering prices in an IPO is fair, otherwise if the security is underpriced, it will register an oversubscription and vice versa. However, it is difficult to get insider information of a given company as this would compromise the integrity of such person or firm exposing the private information to public.

The efficient market hypothesis has however been criticized by psychologists due to market anomalies such as firm, accounting, calendar and event anomalies that prove that markets are not always efficient. Haim and Thierry (2005) describe firm anomaly as such anomalies due to firm characteristics such as firm's size and neglected firm anomaly. This theory is relevant to the current study as it recognizes the role of investor rationality on individual investment

decisions. If markets were efficient, then behavioral biases would not affect individual investment decisions.

2.2.2 Modern Portfolio Theory

Modern portfolio theory (MPT) explains how investors who are hesitant to take risks can build portfolios to optimize returns based on a given level of risk hence finding a balance between maximizing returns and minimizing the related risks. Developed by Markowitz (1952), MPT model proposes that risk of a given portfolio can be measured by the variance of the rate of return. The theory suggests that investors need pay attention on the relationship between level of risk involved and return expected for such investment and diversification of the investments to benefit and make profit out of such investments. Investors therefore need to learn how they can effectively diversify for maximum returns.

MPT assumes that investors are inclined to optimize their return on investment for a certain level of risk beyond which they will not invest since many are risk averse. The theory argues that portfolio risk can be reduced if investors focus on the variability of expected returns and to achieve that, investors should pick assets that tend to have negative correlation. (Frank & Grant, 2001). In building a portfolio, investors make decisions relating to the asset allocation which are the choice among the broad asset classes and security selection decisions which is the choice of which securities to hold within each asset class (Bodie et al., 2008). Modern portfolio theory is relevant to this study as it assumes investors are rational and choose investments that are likely to minimize risk. If this theory was to apply, behavioral biases would not affect individual investment decision.

2.2.3 Capital Asset Pricing Model

Sharpe (1964) developed C.A.P.M as an extension of Markowitz's theory by introducing the concept of systematic and non-systematic risk. CAPM is characterized by various features such as; there is no transaction costs, no limits of borrowing under the risk free rate of interest information is free and random and available to investors at the same time such that no one has added advantage to new information in the market, investors aim is to maximize their economic utility, act rationally, are price takers but risk averse. The CAPM model is of the form: $R_a = R_f + \beta (R_m - R_f)$; R_a is the security's expected return; R_f is risk-free rate of interest; R_m is the expected market return; β is the beta coefficient which is the sensitivity of the expected asset returns to the expected market returns and $\beta(R_m - R_f)$ is the market premium.

CAPM basis its formulation on two types of risks. Systematic or non-diversifiable risk which is the risk of holding the market portfolio. The market movement affects each individual asset in the market and such assets may not be able to control what is happening in the market hence suffer from market risk. Non-systematic risk on the other hand is the risk that is unique to an individual asset which can be reduced through diversification. The investor can diversify the risk through increase of number of assets in his or her portfolio. Non-systematic represents the element of an asset's returns which is unassociated with general market moves (Pandey, 2008). This theory is relevant to the current study as it explains how individual investors make their investment decisions in order to maximize their returns.

2.2.4 Behavioral Theories

The fundamental assumption of traditional finance model is that investors process information rationally to make decisions and act according to predictions of expected utility theory. However, psychologists have challenged this assumption because of anomalies and

misbehaves that are experienced in the market. They maintain that individuals are emotional and experience mental and emotional biases and act in an irrational manner while under behavioural finance researchers argue that investors are seen to suffer from errors of judgement and errors of preference (Kahneman & Tversky, 1979). Over the past, psychologists have found that the standard features of finance theory are descriptively false. Raines and Leather (2011) argue that investors are not confident or sure in their own judgment and depend on conventional judgment in making decisions. The basic behavioural factors that tend to contradict conventional theories of finance are triggered through heuristics decision making process and prospect theory.

Heuristic driven biases are views inclined to a given rule of thumb or experiences that investors use in making decisions in multifaceted environments. Kahneman and Tversky (1979) while supporting these biases argues that irrespective of availability and objective evaluation of the relevant information, people would still use mental and emotional bases in forming their decisions. Various biases that result from heuristic illusions include Representativeness, anchoring, and overconfidence bias. Other forms of heuristic driven biases include aversion to ambiguity and innumeracy. Aversion to ambiguity means people tend to fear uncertain situations where they feel they don't have much information about possible outcomes. Investors manifest this bias when the trade securities of local companies more than the foreign ones and employees purchasing the securities from their employers instead of outside companies. This theory is relevant to the current study as it recognizes behavioral biases as factors that influence individual investment decisions.

2.2.5 Prospect Theory

Prospect theory as proposed by Kahneman and Tversky in 1979 describes the state of mind affecting an individual's decision-making processes and description on how people frame and

make a decision that involves risk and uncertainty. This theory demonstrates that investors value choices in terms of potential gain or loss and think in terms of expected utility relative to a reference point like current wealth or purchase price (Kahneman, 2001). People are less willing to gamble with profits than they are willing with losses. Kahneman and Tversky (1979) argue that those investors feel more pain from a loss than the pleasure from a gain of the similar amount hence the reason for an S-shaped utility curve.

Mental accounting as described by Thaler (1988) affects both personal financial decisions and the complex world of investment. Investors create new virtual accounts in their mind every time they buy new stocks and place each decision, action and outcome about the new stock to such an account. Once an outcome is assigned to a specific mental account it becomes hard to view that outcome in a different way. Investors don't pay much attention to the interactions between or among their assets which in turn adversely affects the overall investor's wealth (Chandra, 2008). This is in contrary to the conventional modern portfolio theory which advocates for asset diversification through portfolio. This theory is relevant to the current study as it recognizes investors are not rational and that their investment choices are influenced by behavioral biases.

2.3 Determinants of Individual Investment Decisions

Both behavioral and market factors affect individual investors choice. Behavioral factors include overconfidence, regret avoidance, loss aversion and herding behavior and other factors in the market include market factors, market efficiency and market information.

2.3.1 Market Factors

Market factors are those factors that affect the operations of the market and have an influence on the investment trends. The changes in prices of securities, news in the market, lack of

attention to fundamentals of underlying stock may cause over or under reaction of the investors. Due to such reaction by investors the factors in turn influence the decision making in the stock market. The changes in prices affect the investors who are sensitive to increase or decrease in price and would have an impact on the investment choices. Waweru et al., (2008), identifies the factors of market that have impact on investors decision making including; change in prices, information in the market, past trends of stocks, investor preference, over-reaction to price changes, and basics of underlying stocks. Market factors are external factors that influence investors in different ways hence it would be wrong to ignore such factors.

Investors give attention to popular stocks in the market and that past trends of stocks are also explored to impact the decision-making behavior of the investors at a certain level by. In this concept, investors usually analyze the past trends of stocks by technical analysis methods before deciding an investment. Investors preference on securities also affect their investment decisions. If an investor is interested in insurance industries, they might overlook other securities from other industries even if they are performing better than the preferred industry (Raines &Leather, 2011).

2.3.2 Market Efficiency

Luu (2012) explained market efficiency and supported the EMH theory of market by noting that efficiency of the market assumes that market prices reflect fundamental market characteristic and that excess returns on the average are leveled out in the long run. This assumption has been challenged by behavioral finance as there are various market anomalies such as abnormal price movements during IPOS, mergers, and stock splits that cannot be explained using the efficiency market hypothesis. The anomalies propose that the conventional principles and assumptions of rational behavior under efficient market

hypothesis are not entirely correct and that there is need to study other models of human behavior in investment decisions (Shiller, 1998).

2.3.3 Market Information

Conventional finance theories argue that information is a key factor in the market and influences the type of decisions made by investors. The availability of new information in the market would make different investors react differently to the dynamics of the market. Investors are assumed to be rational and would react to such information which in turn would influence the way of investing. Such market information may include dividend policies of a firm, earning per share, market share of the company and overall company performance (Shiller, 2003).

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. According to Chong and Lai (2011) when making a venture decision, intelligent individuals tend to look for information on how other investors behave and perform. The time of releasing the information on the market had a great influence on how investors came up with their decisions (Hughes, 2008).

2.4. Empirical Review

This section provides details of previous international and local evidence on research carried on behavioral biases and investment decisions. Kengatharan (2014) carried out a study to examine the influence of behavioural factors on investment decision and performance in Colombo securities exchange. The study used questionnaire to collect cross sectional data adopted descriptive survey and co-relational design. Using descriptive statistics, exploratory

factor analysis and regression analysis the results showed that investment decisions are significantly affected by heuristic factors. On the other hand overconfidence had an inverse significant relationship with investment decisions while anchoring had a positive significant relationship.

In a study on analysis of behavioral finance theories in international equity markets by Wilson (2007), it was found out that behavioral biases have an impact on asset prices and there is significance difference between institutional and individual investors in terms of rationality where institutions seem to be more rational in their decisions while individual investors are heavily plagued by systematic biases in their investment behavior and seem to represent a source of noise trader risk in the markets.

In a study on behavioral factors that influence decision making and investment performance in Ho Chi Minh stock exchange based in Vietnam, Luong, (2011) identified five factors that have an impact on the investment decisions of individual investors. Among them included, herding, market, prospect, overconfidence, gamble's fallacy, and anchoring bias. Luong used questionnaires to collect the data and used SPSS software to carry out correlation analysis between behavioral biases and performance. Luong also found out that out of the five factors, only three affected the investment performance which include herding, prospect and heuristic biases.

Pompian (2016) conducted a survey on 290 top investment advisers from stock exchanges in 30 countries, to investigate the effects of cognitive biases. He discovered that cognitive errors or biases stem 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 either hidden mental processes for information or irrational tolerance in individuals own attitudes. The writer states that this

comes because cognitive errors result from bad reasoning, education, advice and better information can at most be gotten from them.

Locally, Werah (2006) in her study on the influence of behavioral biases on both individual and institutional investors' activities at the NSE submitted that the behavior of investors is to some level irrational because of anomalies such as herd behavior, overconfidence and herding. By use of questionnaires as primary data collection method, data analysis results pointed out that the investors at NSE are to some extent irrational and don't pay attention to fundamental estimations due to the behavioral biases such as anchoring, herding and regret aversion.

Nyamute and Maina (2010) conducted an empirical review leading to revision of the theories that explain the concept of behavioral finance. The findings of indicated that financial literacy may not always result in improved emergency 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.

Kimani (2011) in his study that sought to determine the impact levels of behavioral influences such as herding on the individual investor choices of securities at NSE in the equity market identified various behavioral factors that influence investment decisions. These factors included herding, mental accounting bias, overconfidence bias, gamblers fallacy and anchoring bias. The data for the study was collected from 100 individual investors by use of questionnaires.

Mwaka (2013) showed that demographic characteristics of investors determine the investors' decision-making behavior. His study noted that some investors made decisions rationally while the majority of them were affected emotionally and by behavioral biases. The biases

tested include herding, over confidence, anchoring and loss aversion. All these biases affected investors as they traded in shares though others were more prominent than others.

Ndiege (2015) in his study on the factors influencing investment decision in equity stocks at the Nairobi stock exchange among teachers in Kisumu Municipality to establish if investors preferred investing in real estate than investment stocks. By use of descriptive analysis of the data collected, the study concluded that majority of the investors preferred to invest in real estate as opposed to investment stocks in which only small proportion of 28 per cent of the respondents invested. Herd mentality was also found to play a role in investment decisions.

2.5 Conceptual Framework

The conceptual framework reflects diagrammatically the relationship between investment decisions and behavioral biases.

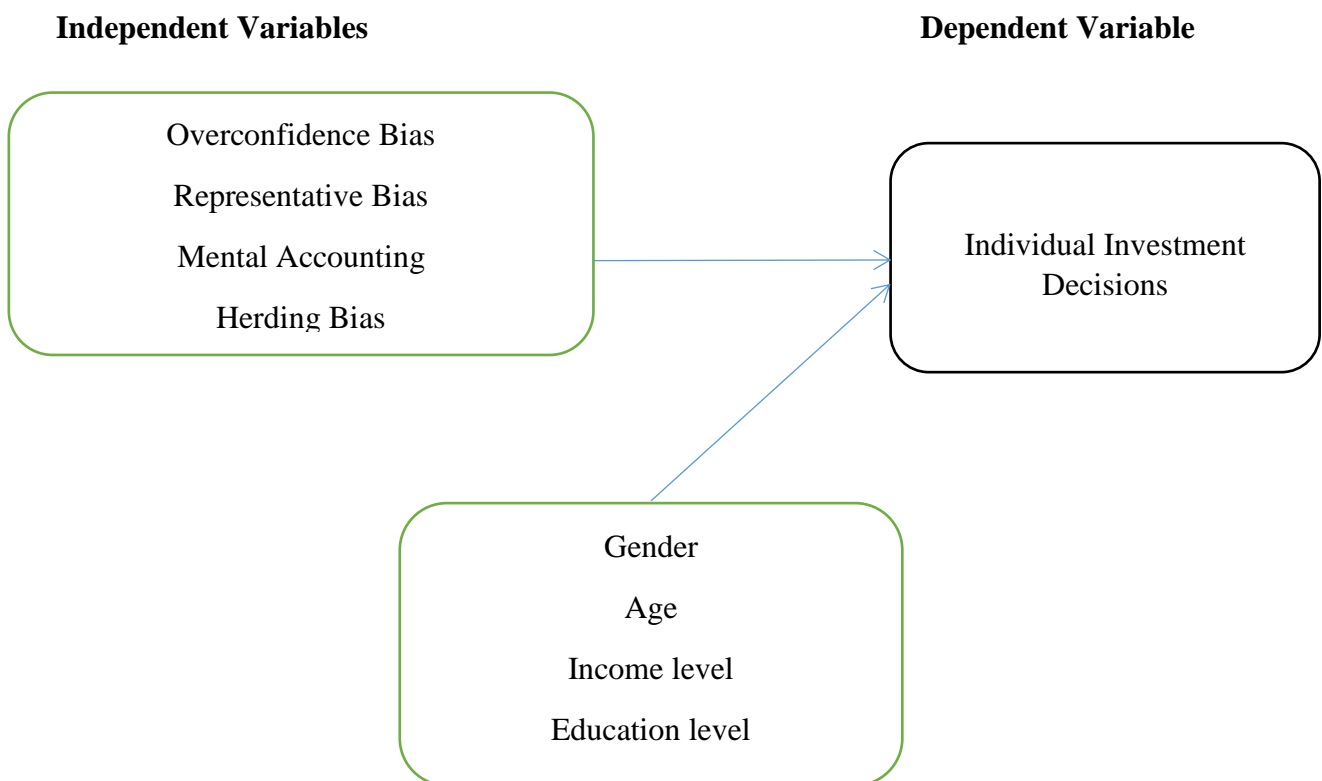


Figure 2.1: Conceptual Model

Source: Researcher 2018

2.6 Summary of Literature Review

The existing literature has reviewed the behavioral biases that have an effect on individual investor decisions. Such biases discussed include representativeness bias, cognitive dissonance, loss aversion, overconfidence, regret avoidance, and mental accounting biases show that investors are irrational when making investment decisions. This contradicts the assumptions of traditional theories which are concerned with the market factors. Empirical studies however don't provide a clear position on degree to which behavioral biases affect the investment decisions of individuals. Also, the local studies have concentrated more on herding as one of the biases affecting individuals although other biases have been confirmed by literature review to affect individual decisions on investment.

Previous studies carried out have revealed that both individuals and institutional investors decisions are influenced by heuristics, and cognitive influences in their decision making but not to the extent of showing all the factors and how they affect investment decisions. Local studies have also concentrated on a small sample of population and not detailed analysis of the variables. It is therefore evident that there are gaps in behavioral finance and this study intends to address such gaps. Furthermore, many studies have concentrated on the developed countries with less attention to developing country like Kenya. This study sought to study the behavior of investors and how such behaviors affect the decision-making process.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction.

The chapter describes the methodology that was used in the study. It forms an outline for identifying the relationships between the various behavioral biases and individual investment decisions. The chapter provides information on the target population of the study, sampling techniques, and data collection procedure analysis.

3.2 Research Design.

De Vaus, (2006) defines research design as a systematic approach used to conduct a study that involves integrating different components of the study in a logical way to ensure that the research problem is effectively addressed.

The study adopted the descriptive research design to identify the relationship between behavioral biases and individual investment decisions. De Vaus, (2006) denotes that descriptive design is intended to provide thorough information about subjects' characteristics within a field of study, thus, it helps in identifying relationships between variables.

3.3 Population.

This study involved surveying individual investors who trade at the NSE based Nairobi . According to CMA quarterly statistical bulletin (Q2-2018) there are about 1,597,269 individual investors trading in NSE as at June 2018.

3.4 Sample

Using the formula developed by Kothari (2004) and recommended by Mugenda (2003), the appropriate sample size for a population of 1,597,269 is 385 as determined by the formula below.

$$n = \frac{Z^2 pq}{d^2}$$

Where:

n = required sample size

Z = Z-Score at 95%

p = the proportion in the target population estimated to have characteristics being measured assumed to be 50%

q = 1 – p

d = Margin of error- 5%

$$n = \frac{(1.96)^2 (.50)(1-.50)}{(0.05)^2}$$

Hence n=384.16 rounded up to 385

This sample size was selected using purposive sampling from the investors based in Nairobi. This resulted to a total of 385 individual investors which were used as a representative sample of individual investors. Purpose sampling was used to help the researcher reach only those investors that were able to understand the questionnaire and also help in saving time and resources in data collection.

3.5 Data Collection

Data was collected by use of a questionnaire. The questionnaire was formatted to have questions formed based on five Likert scale to allow the respondents to express their opinion on the study variables.

The study adopted a drop-and-pick approach of giving the questionnaire to the sampled respondents. The approach is preferred to ensure more feedback in terms of returned

questionnaires and reduce the data collection time. The questionnaire was grouped to three sections with first section having the respondent's background information, the second section incorporated the behavioral factors influencing investment decisions and the last section included individual investment decisions.

3.6 Data Analysis

The study intends to employ descriptive analysis in coding, summarizing and analyzing the data. The responses were coded to various categories to be used for analysis using statistical package for social science (SPSS). The results were summarized by use of graphs, frequency diagrams, charts and percentages.

The study employed a multi-linear regression model to establish the relationship between behavioral biases and individual investment decisions.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \text{ where}$$

Y-is the dependent variable representing the individual investment decisions on either to buy, hold or sell securities. The scores were derived from Likert scale for each behavioral factor.

X₁ . Herding Bias

X₂ . Representative Bias

X₃ . Mental Accounting Bias

X₄ . Overconfidence Bias

$\beta_1 \dots \beta_4$ represent the coefficients that provide relationship and the strength between the dependent variable (Individual Investment decision) and independent variables (behavioral biases)

α - is a constant representing independent investment decision factors.

The variables were operationalized as below;

Table 3.1: Operationalization of Variables

	Variable of Study	Operationalization
X1	Herding Bias	Use of Five Likert scale from the questionnaire for Reference question 5 A. The variable was measured using ordinal scale of measurement.
X2	Representativeness Bias	Use of Five Likert scale from the questionnaire for Reference question 5 B. The variable was measured using ordinal scale of measurement.
X3	Mental Accounting Bias	Use of Five Likert scale from the questionnaire for Reference question 5 C. The variable was measured using ordinal scale of measurement.
X4	Overconfidence Bias	Use of Five Likert scale from the questionnaire for Reference question 5 D. The variable was measured using ordinal scale of measurement.
Y	Individual Investment Decision	Measured by the choice to defer consumption and postpone it to a future date; either through buying more shares, selling or holding shares. The variable was measured using ordinal measurement for the section C the questionnaire and Interval measurement on the last part (6b)

3.6.1 Diagnostic Tests

Linearity uses the mathematical equation $Y=bX$ where c is a constant to show the association between variable X and Y . The linearity test was obtained through F-statistic in ANOVA. Normality is a test for the assumption that the residual of the response variable are normally distributed around the mean. This was determined by Shapiro-walk test or Kolmogorov-Smirnov test (Khan, 2008).

Multicollinearity is said to occur when there is a nearly exact or exact linear correlation among two or more of the independent variables. This was tested by the determinant of the correlation matrices, which varies from zero to one. Orthogonal independent variable is an indication that the determinant is one while it is zero if there is absolute linear dependence between them and as it approaches to zero then the multi-collinearity becomes more intense.

Variance Inflation Factors (VIF) and tolerance levels were also carried out to show the degree of multi-collinearity (Burns & Burns, 2008).

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

The objective of the study was to establish the effects of behavioral biases on individual investment decisions at the Nairobi Securities Exchange. This chapter covers the results of data analysis and discussion of the findings of the implementation of methodology outlined in previous chapter.

4.2 Response Rate

A total of 385 semi-structured questionnaires were administered to individual investors who traded at the Nairobi Securities Exchange and the researcher managed to receive 308 properly filled questionnaires resulting to a response rate of 80% and a none response of 20%. The researcher considered this as an adequate representation of the target population since Edwards, Clarke and Kwan (2002) recommends at least a response rate of 80%.

Table 4.1: Response Rate

Response Rate	Frequency	Percentage
Properly Filled	308	80
None Response	77	20
Total	385	100

Source: Research Findings (2018).

4.3 Reliability and Multi-collinearity Tests

Reliability test and multi-collinearity test were done to check the internal consistency of the questionnaire and the whether any multi-collinearity existed between the dependent and independent variables.

4.3.1 Reliability Test

To test the internal consistency of questionnaire, reliability test was done with a Cronbach Alpha co-efficient ≥ 0.7 used as an indicator. Results are shown in Table 4.2.

Table 4.2: Reliability Statistics

Variable	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Herding Bias	0.737	0.722	3
Representativeness Bias	0.724	0.714	3
Mental Accounting Bias	0.711	0.713	3
Overconfidence Bias	0.757	0.706	4
Individual Investment Decision	0.789	0.706	2
Aggregate	0.744	0.792	15

Source: Research Findings (2018)

Reliability statistics results indicated that the questionnaire used was internally consistent in all the sections as evidenced by the Cronbach's Alpha co-efficient aggregate value of 0.744. Herding Bias (0.737), Representativeness Bias (0.724), Mental Accounting Bias (0.711), Overconfidence Bias (0.757) and Individual Investment Decision (0.798) recorded Cronbach's Alpha co-efficients greater than 7. The questionnaire was therefore reliable in measuring the variables.

4.2.2 Test of Multi-collinearity

The study further carried out multi-collinearity tests Tolerance and Variance Inflation Factor (VIF) statistics. VIF values greater than 3 would indicate that the variables being used have multi-collinearity issues. The results of the test are as shown in Table 4.3.

Table 4.3: Test of Multi-collinearity

Multi-collinearity Coefficients^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Herding Bias	.944	1.059
	Representativeness Bias	.985	1.015
	Mental Accounting Bias	.951	1.052
	Overconfidence Bias	.978	1.023
a. Dependent Variable: Individual Investment Decision			

Source: Research Findings (2018).

The results above indicate that multi-collinearity tests recorded VIF values of less than 3. This implies that no multi-collinearity exists between the independent variables (Herding Bias, Representativeness Bias, Mental Accounting Bias and Overconfidence Bias) and the dependent variable (Individual Investment Decision). This implies that inflation, dividend policy, financial performance, capital adequacy, size of the firm and corporate governance can be used as determinants of commercial banks share returns.

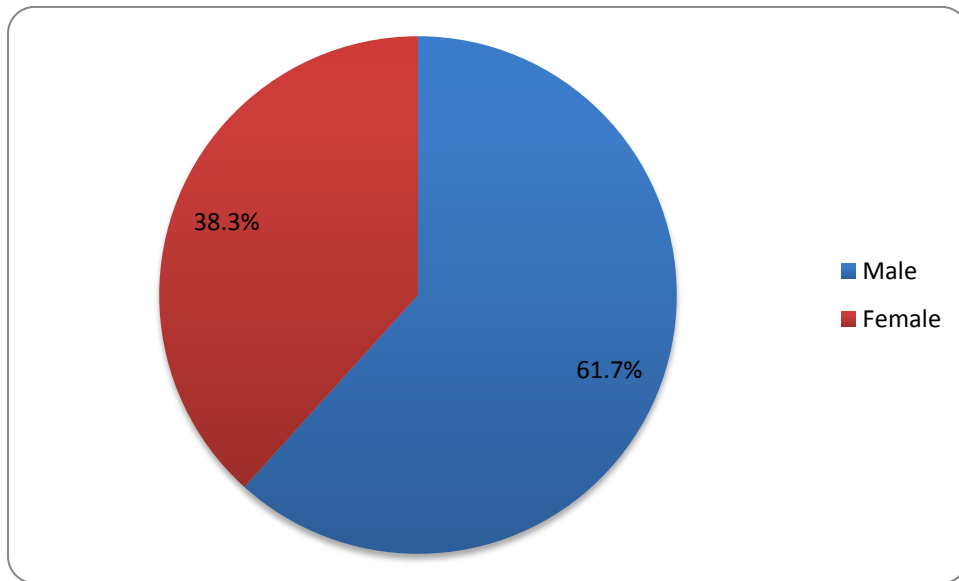
4.4 General Information

The section presents the general information of the respondents. The information discussed is in regard to gender of the respondent, age of the respondent, level of education and average monthly income. The results are discussed below.

4.4.1 Gender of the Respondent

The study sought to establish the gender of the individual investors who trade at the Nairobi Securities Exchange. The results of the study are as shown in Figure 4.1.

Figure 4.2: Gender of the Respondent



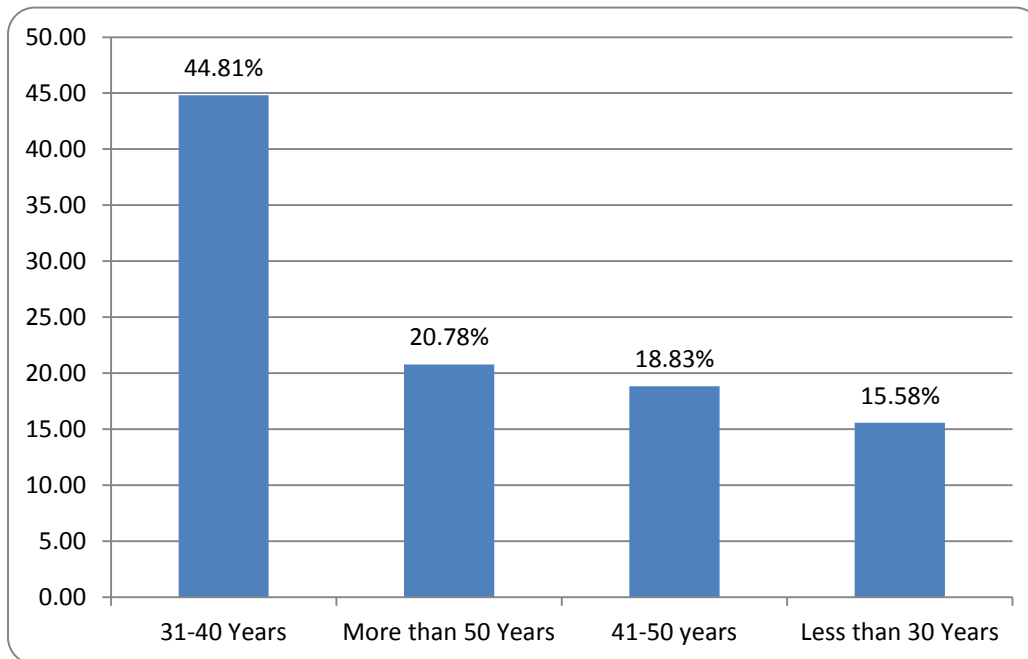
Source: Research Findings (2018)

It was established that majority (61.7%) of the individual investors who trade at the Nairobi Securities Exchange were male while 38.3% were female. This implies that while both gender participate at trading at the Nairobi Securities Exchange, the dominant gender is male. The results also indicate that the researcher was not gender biased when administering the questionnaires to the respondents.

4.4.2 Age of the Respondent

The respondents were requested to provide details about their age. The results are as shown in Figure 4.2.

Figure 4.2: Age of the Respondent



Source: Research Findings (2018).

The results revealed that most (44.81%) of the investors who trade at the Nairobi Securities Exchange were aged between 31-40 years followed by 20.78% of the investors who were more than 50 years old. Further, those in the 41-50 years age bracket represented 18.83%. Those who were less than 30 years old were the least at 15.58%. These results points to the fact that no single age bracket dominates trading at the Nairobi Securities Exchange. However, younger people were the least pointing to the need for training and induction of the younger generation to stock investing.

4.4.3 Education Level

The study further sought to establish the respondents' education level. The results are as tabulated in Table 4.4.

Table 4.4: Level of Education

Level of Education	Frequency	Percent
Degree Certificate	252	81.82
Postgraduate/PhD	30	9.74
Diploma	26	8.44
Total	308	100

Source: Research Findings (2018).

The established that majority (81.82%) of the investors who trade at the Nairobi Securities Exchange are degree certificate holders while 9.74% of the investors are Postgraduate/PhD certificate holders. The respondents who had a level of education represented 8.44% of the respondents. These findings reveal that the respondents had sufficient levels of education to understand the effects of behavioral biases on individual investment decisions at the Nairobi Securities Exchange.

4.4.4 Average Monthly Income

Finally, the study sought to establish the average monthly income of the investors who trade at the Nairobi Securities Exchange. Table 4.5 presents the summary of results.

Table 4.5: Average Monthly Income

Income Range	Frequency	Percent
Less than Kshs 10000	8	2.6
Kshs 10000-19999	47	15.3
Kshs. 20000-49999	83	26.9
Kshs 50000-99999	95	30.8
Kshs 100000-200000	62	20.1
More than 200000	13	4.2
Total	308	100.0

Source: Research Findings (2018)

It was established that most (30.8%) of the investors had an average monthly income of Ksh. 50,000-99,999 followed by 26.9% of the respondents who had an average monthly income of

Kshs. 20,000-49,999 and then those with an average monthly income of Kshs. 100,000-200,000. Those with an average income of more than Kshs. 200,000 represented 4.2%. Only a few investors (2.6%) reported to have an average monthly income of Less than Kshs. 10,000. These results indicate that the researcher sourced information from investors who have different types of average monthly income.

4.5 Behavioural Factors Influencing Investment Decisions

The study further sought to determine the extent to which various behavioural factors (herding bias, representativeness bias, mental accounting bias and overconfidence bias) influencing investment decisions. Below is the interpretation scale of the mean scores recorded.

1.00 - 1.49: No Extent;

1.50 - 2.49: Little Extent;

2.50 - 3.49: Moderate Extent;

3.50 - 4.49: Great Extent and

4.50 - 5.00: Very Great Extent.

The results are tabulated in Table 4.6.

Table 4.6: Behavioural Factors Influencing Investment Decisions

Herding Bias	Mean	Std. Deviation
The stock volume invested in by other investors affect my investment decisions	3.81	1.197
I invest in stocks where more investors are investing in.	3.72	0.826
I tend to react speedily to changes by other investors and follow market reaction	2.44	1.291
Mean	3.32	1.105
Representativeness Bias	Mean	Std. Deviation
I tend to invest more after a positive return	4.42	0.585
My history on investments influences my present decisions.	4.04	0.863
After a loss I become cautious and risk averse on investing	4.02	0.877
Mean	4.16	0.775

	Mean	Std. Deviation
Mental Accounting Bias		
I would reinvest money received as bonus in securities than I will be invest education fees	4.12	0.804
I don't consolidate my investments to assess the performance rather I look at each separately	3.78	1.221
I treat each investment independently	3.68	1.454
Mean	3.86	1.160
Overconfidence Bias		
I react to new information in the stock market	4.08	0.768
I can anticipate when the stock is performing well or poorly	3.66	1.328
I have the necessary skills and knowledge in stock market.	3.41	1.422
I can decide when to buy and sell shares due to my skills	3.33	1.235
Mean	3.62	1.188
Aggregate Mean	3.62	1.188

Source: Research Findings (2018).

The study established that overall, behavioural factors influence investment decisions to a great extent as evidenced by the aggregate mean score of 3.62($SD= 1.188$). Representativeness Bias had the greatest impact on investment decisions as evidenced by a mean score of 4.16($SD= 0.663$). To a great extent, the respondents reported that they tend to invest more after a positive return; their history on investments influences their present decisions and that after a loss they become more cautious and risk averse on investing.

Mental Accounting Bias had the second greatest impact investment decisions with a mean score of 3.86 ($SD= 1.160$). It influenced investment decisions to a great extent. To a great extent, the respondents reported that they would reinvest money received as bonus in securities than invest it in education fees; they don't consolidate their investments to assess the performance rather than look at each separately and that they treat each investment independently.

Overconfidence Bias had the third greatest influence on investment decisions as evidenced by a mean score of ($M=3.62$, $SD= 1.188$) indicating that it influences investment decisions to a great extent. The respondents reported that they react to new information in the stock market; anticipate when the stock is performing well or poorly; have the necessary skills and knowledge in stock market and can decide when to buy and sell shares due to my skills.

4.5 Individual Investment Decision

The respondents were further requested to indicate the extent of their agreement in regard to various individual investment decisions. The mean scores recorded were interpreted using the following interpretation scale:

- 1.00 - 1.49: Highly Disagree
- 1.50 - 2.49: Somehow Disagree;
- 2.50 - 3.49: Agree Somehow;
- 3.50 - 4.49: Agree;
- 4.50 - 5.00: Highly Agree.

The results are tabulated in Table 4.7.

Table 4.7: Individual Investment Decision

Individual Investment Decision	Mean	Std. Deviation
I feel satisfied with investment decisions I have made previously including selling, buying and holding of securities.	4.14	0.729
I am more of a risk averse person for my investment decision outcome.	3.68	1.057
Aggregate Mean	3.91	0.893

Source: Research Findings (2018).

The aggregate mean score of 3.91 ($SD= 0.893$) indicated that the respondents agreed to a great extent on various individual investment decision. The most agreed upon statement was that the respondents feel satisfied with investment decisions they have made previously including selling, buying and holding of securities as indicated by a mean score of 4.14 ($SD= 0.729$). Further, the respondents agreed that they are more risk averse people for their investment decision outcome as evidenced by the mean score of 3.68 ($SD= 1.057$). The variation in the respondent's level of agreement is as indicated by the standard deviations.

4.6 Regression Analysis

Regression analysis was done to the effects of behavioral biases on individual investment decisions at the Nairobi Securities Exchange. The results are as discussed under the model summary, analysis of variance and regression co-efficients.

4.6.1 Model Summary

Individual investment decisions at the Nairobi Securities Exchange were regressed against behavioral biases. The model summary results are as tabulated in Table 4.8.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.729 ^a	.531	.525	.03971

a. Predictors: (Constant), Overconfidence Bias, Mental Accounting Bias, Representativeness Bias, Herding Bias

Source: Research Findings (2018)

The study found out that there was a strong relationship (R-value = 0.729) between behavioral biases and individual investment decisions of investors who trade at the Nairobi Securities Exchange. The Adjusted R Square value of 0.525 revealed that behavioral biases can explain 52.5% of the total variance in the individual investment decisions of individual investors who trade at the NSE.

4.6.2 Analysis of Variance (ANOVA)

Analysis of Variance (ANOVA) statistics were further computed for fitness of regression model test to the data collected. The findings of the study are as shown in Table 4.9.

Table 4.9: Analysis of Variance (ANOVA^a)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.200	4	5.050	5.501	.000 ^c
	Residual	278.236	303	0.918		
	Total	308.436	307			
a. Dependent Variable: Individual Investment Decision						
c. Predictors: (Constant), Overconfidence Bias, Mental Accounting Bias, Representativeness Bias, Herding Bias						

Source: Research Findings (2018).

The F-ratio of 5.501 and p-value of 0% indicated that the regression model used in study was fit for the data that was collected. The model was therefore suitable for predicting the effect of behavioral biases on individual investment decisions at the Nairobi Securities Exchange

4.6.3 Regression Coefficients

The regression co-efficients were computed at 95% confidence interval with a p-value 0.05 being used as the indicator of significance. Below table summarizes the results

Table 4.10: Regression Coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.320	.439		5.287	.000
	Herding Bias	-.152	.062	-.104	-2.452	.014
	Representativeness Bias	.299	.087	.159	3.437	.001
	Mental Accounting Bias	.195	.046	.141	4.239	.000
	Overconfidence Bias	-.175	.045	-.126	-3.889	.000
a. Dependent Variable: Individual Investment Decision						

Source: Research Findings (2018).

It was established that herding bias ($\beta = -0.152$) and overconfidence bias ($\beta = -0.175$) had a negative effect on the individual investment decision while representativeness bias ($\beta = 0.299$) and mental accounting bias ($\beta = 0.195$) were found to have a positive effect on the individual investment decision as evidenced by the beta values shown alongside. The effect of herding bias (t-value = -2.452, p-value = 0.014), overconfidence bias (t-value = -3.889, p-value = 0.000), representativeness bias (t-value = 3.437, p-value = 0.001) and mental accounting bias (t-value = 4.239, p-value = 0.000) was found out to be statistically significant as confirmed by the high t-values and p-values of less than 0.05.

The study generated the following analytical model:

$$Y = 2.320 - 0.152X_1 + 0.299X_2 + 0.195X_3 - 0.175X_4$$

Where,

Y – Individual Investment Decision (Dependent variable)

X₁ - Herding Bias

X₂- Representativeness Bias

X₃- Mental Accounting Bias

X₄- Overconfidence Bias

The above analytical equation shows that the Individual Investment Decision of individual investors trading at the NSE would be 2.320 in the absence of behavioural bias. . Increasing Herding Bias and Overconfidence Bias would reduce the quality of individual investment decision making while increasing Representativeness Bias and Mental Accounting Bias would improve the quality of individual investment decision making.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives briefing on the results and findings of the study. The chapter also draws the conclusions of the study, makes policy recommendations for further study in relation to the effects of behavioural biases on individual investment decisions at the Nairobi Securities Exchange.

5.2 Summary of the Study

The general objective of the study is to establish the effect of behavioral biases on the individual investment decisions of individual investors who trade at the Nairobi Securities Exchange. Descriptive statistics and inferential statistics were used to analyze the data with the aid of SPSS. The researcher administered 385 semi-structured questionnaires to individual investors who traded at the Nairobi Securities Exchange receive 308 properly filled questionnaires giving response rate of 80% and a none response of 20%.

The study established that there was a strong relationship ($R\text{-value} = 0.729$) between behavioral biases and individual investment decisions of investors who trade at the Nairobi Securities Exchange. The Adjusted R Square value of 0.525 revealed that behavioral biases can explain 52.5% of the total variance in the individual investment decisions of individual investors who trade at the NSE. Increasing herding bias and overconfidence bias were found to reduce the quality of individual investment decision making while representativeness bias and mental accounting bias were found to improve the quality of individual investment decision making in a statistically significant manner.

These findings supported existing empirical results. Luong, (2011) found out that the five factors that have an impact on the investment decisions of individual investors among others herding, market, prospect, overconfidence, gamble's fallacy, and anchoring bias. Werah (2006) found out that the behavior of investors is to some level irrational because of anomalies such as herd behavior, overconfidence and herding. Kimani (2011) established that the factors that impact individual investor choices of securities at NSE includes herding, mental accounting bias, overconfidence bias, gamblers fallacy and anchoring bias.

5.3 Conclusion of the Study

The study concluded that there was a strong relationship ($R\text{-value} = 0.729$) between behavioral biases (herding bias, overconfidence bias, representativeness bias and mental accounting bias) and individual investment decisions at the Nairobi Securities Exchange. The Adjusted R Square value of 0.525 revealed that behavioral biases can explain 52.5% of the total variance in the individual investment decisions of individual investors who trade at the NSE.

The study also concluded that herding bias and overconfidence bias have a negative and statistically significant effect on individual investment decision making while representative bias and mental accounting bias had a negative and statistically significant effect on individual investment decision making. This implied that increasing herding bias and overconfidence bias would reduce the quality of individual investment decision making while representative bias and mental accounting bias would improve the quality of individual investment decision making in a statistically significant manner. The study concluded that representativeness bias is one of the most common biases affecting investment decisions making because people's judgments are based on stereotypes or recent and future security prices.

Since investors cannot avoid all the biases, there is need to reduce their effects. For this to happen it calls for investors to understand their cognitive biases, and resist the tendency of engaging in such behaviors through developing and following objective investment strategies and trading guidelines. There is also need for investors to have long-term investment goals and identify the extent of risk they can tolerate and come up with an optimal asset allocation strategy.

5.4 Recommendations of the Study

The recommendations are based on the behavioural biases of the study. On the overconfidence bias, there is need for investors to identify the biases and develop the strategies to overcome them and need proper allocation strategies to identify the risk and return when making their investment decisions. The study recommends that investment and financial consultants should conduct training for investors to help them identify the biases and hence develop strategies against excessive trading as a result of bias which lead to poor investment decision.

Representativeness is one of the most important principles affecting financial decisions because people's judgments are based on stereotypes. The study recommends that security's investors should avoid evaluating frequency or probability of events according to the times such events comes to their minds. This is because when too much weight is put on the easy-recalled information, rational behavior will be limited and rational investment decision making could be deviated.

The study also recommends the need for Nairobi Securities Exchange to step up its efforts in increasing the investors awareness of the market through training and education by holding accounting and financial seminars geared toward improving financial skills which will consequently improve investors evaluation skills prior to investing in securities. Policy makers should make it their responsibility to educate investors on the effects of cognitive biases.

The study recommends investors to seek professional advice from security brokers to advise them accordingly in-terms of performance of specific securities in which the investor would want to invest in since such investment brokers have information of the market. However such brokers should be guided by policies and regulations to avoid exploiting investors by misadvising them and taking advantage of their inexperience in the field.

5.5 Limitation of the Study

Some respondents were reluctant in filling the questionnaires fearing that the information provided would be used inappropriately. The researcher made an assurance to the respondents that the information they provide would be treated with utmost confidentiality and would only be used to fulfill academic requirements. The respondents being investors trading at the Nairobi Securities Exchange had busy working schedules which made the data collection process tedious and slow. The researcher used drop-and-pick-later method to give the respondents ample time to fill the questionnaires.

Due to the time limit and the finances the researcher could only carry out the research in Nairobi County. However the response of the respondents represented an acceptable sample size for data collection, analysis and conclusion of the study. The time constraint was a limitation of the study as the researcher had to balance between research undertakings and other commitments especially work related.

Further, the researcher had no direct control over the accuracy of the information provided by the respondents. This implies that the accuracy of the information provided was the responsibility of the respondents. The researcher dealt with the challenge requesting the respondents to provide accurate information and which would be treated confidentially.

5.6 Areas for Further Research

The scope of this study was limited to the effects of behavioural biases on individual investment decisions at the Nairobi Securities Exchange. This implies that the findings cannot be adequately applied to non-behavioural factors that influence the individual investment decisions making of individual investors who trade at the Nairobi Securities Exchange. In future, a similar study should be done focusing on non-behavioural factors. The study recommends more research on effects of behavioural biases on other sectors of economy other than securities such as real estate and property.

Further, behavioural biases (herding bias, overconfidence bias, representativeness bias and mental accounting bias) could only explaining 52.5% of the total variance in the individual investment decisions of individual investors who trade at the Nairobi Securities Exchange. The behavioural biases could not explain what influences the remaining 47.5% of the investment decisions. A future study can focus on what influences the remaining 47.5% of the investment decisions.

Further studies should be carried out on the effect of behavioral finance factors on investment decision of individual investors at the Nairobi Securities Exchange and should focus on other counties all over the country to compare the findings, and probably use a larger sample size for more precision. Since this study concentrated on only four biases (Overconfidence, representativeness, herding and mental accounting), further study need to be conducted on the other behavioural biases. The study also concentrated in individual investors only. A further study should be conducted on institutional investors at the Nairobi Securities Exchange.

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APPENDICES

Appendix I: Questionnaire

My name is Samuel Kimani, a student at the University of Nairobi writing my MBA research project on behavioral biases that affect individual investment decisions at the NSE. I kindly request you to take part of your time to complete this questionnaire to enable me to get the data needed for my research. I assure you that all the information provided was treated with strict confidentiality. In each question provide the response that best reflects your own experiences. Your cooperation will greatly contribute to the success of this study and application of the findings.

Section A: Background of the Respondent

1. Gender Male Female

2. Age: Less than 30 Years 31-40 Years 41-50 years More than 50 Years

3. Level of education Completed Primary Certificate Secondary Certificate Other College Education Diploma Degree Certificate Postgraduate/PhD

4. Please estimate your average monthly income (KSHS)
Less than 10,000 10,000 – 19,999 20,000-49,999 50,000-99,999 100,000-200,000 More than 200,000 .

Section B: Behavioral Factors Influencing Investment Decisions

5. Please tick according to the degree of your agreement with the following statements

Behavioral Factors Influencing Investment Decisions	Highly Disagree	Somehow Disagree	Agree	Somehow Agree	Highly Agree
A. Herding Factors					
I invest in stocks where more investors are investing in.					
The stock volume invested in by other investors affect my investment decisions					
I react quickly to changes by other investors and follow market reaction					
B. Representativeness Bias					
My history on investments influences my present decisions.					
I tend to invest more after a positive return					
After a loss I become cautious and risk averse on investing					

C. Mental Accounting					
I treat each investment independently					
I don't consolidate my investments to assess the performance rather I look at each separately					
I would reinvest money received as bonus in securities than I will be invest education fees					
D. Overconfidence					
I react to new information in the stock market					
I have the necessary skills and knowledge in stock market.					
I can decide when to buy and sell shares due to my skills					
I can anticipate when the stock is performing well or poorly					

Section C: Investment Decisions.

6. A. Please tick according to the degree of your agreement with the following statements.

	Highly Disagree	Somehow Disagree	Agree	Somehow Agree	Highly Agree
I am more of a risk averse person for my investment Decision outcome.					
I feel satisfied with investment decisions I have made previously including selling, buying and holding of Securities.					

Thank you for your time and information.

Appendix II: Publicly Listed Companies

1. Athi River Mining
2. Atlas Development and Support Services
3. B.O.C Kenya Ltd
4. Bamburi Cement Ltd
5. Barclays Bank Ltd
6. Britam Holdings Ltd
7. British American Tobacco Kenya Ltd
8. Car and General (K) Ltd
9. Carbacid Investments Ltd
10. Centum Investment Co Ltd
11. CIC Insurance Group Ltd
12. Co-operative Bank of Kenya Ltd
13. Crown Paints Kenya PLC
14. Deacons (East Africa) PLC
15. Diamond Trust Bank Kenya Ltd
16. E.A. Cables Ltd
17. E.A. Portland Cement Ltd
18. Eaagads Ltd
19. East African Breweries Ltd
20. Equity Group Holdings
21. Eveready East Africa Ltd
22. Express Ltd
23. Flame Tree Group Holdings Ltd
24. HF Group Ltd
25. Home Afrika Ltd
26. I&M Holdings Ltd
27. Jubilee Holdings Ltd
28. Kakuzi
29. Kapchorua Tea Co. Ltd
30. KCB Group Ltd
31. Kengen Ltd
32. KenolKobil Ltd

33. Kenya Airways Ltd
34. Kenya Orchards Ltd
35. Kenya Power & Lighting Co Ltd
36. Kenya Re-Insurance Corporation Ltd
37. Kurwitu Ventures
38. Liberty Kenya Holdings Ltd
39. Limuru Tea Co. Ltd
40. Longhorn Publishers Ltd
41. Mumias Sugar Co. Ltd
42. Nairobi Business Ventures Ltd
43. Nairobi Securities Exchange Ltd
44. Nation Media Group
45. National Bank of Kenya Ltd
46. New Gold Issuer (RP) Ltd
47. NIC Group PLC
48. Olympia Capital Holdings Ltd
49. Rea Vipingo Plantations Ltd
50. Safaricom PLC
51. Sameer Africa PLC
52. Sanlam Kenya PLC
53. Sasini Ltd
54. Scangroup Ltd
55. Stanbic Holdings Plc
56. Standard Chartered Bank Ltd
57. Standard Group Ltd
58. Stanlib Fahari I-REIT
59. Total Kenya PLC
60. TPS Eastern Africa (Serena) Ltd
61. Trans-Century Ltd
62. Uchumi Supermarket Ltd
63. Umeme Ltd
64. Unga Group Ltd
65. Williamson Tea Kenya Ltd