EFFECT OF FINANCIAL LITERACY ON BEHAVIORAL BIASES OF INDIVIDUAL STOCKS INVESTORS AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

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

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DEDICATION

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ABSTRACT

The objective of this research was to establish the effect of financial literacy on behavioral biases of individual investors at the Nairobi Securities Exchange. Research targeted population was all the individual investors at NSE whose number stood at 1,200,175 as at 31st July 2018.The study sample size was 100 individual investors who were picked randomly from individuals who visited the offices of the 24 registered stocks brokerage firms in Kenya from 3rd to 20th September,2018 . The research used first-hand information. This was gathered using questionnaires administered to the individual investors who visited the offices of the firms between 3rd and 20th September 2018. Descriptive and inferential statistics methods were used to analyze the study data. The researcher used simple regression analysis technique in establishing the type of the relationship that exist between the independent and dependent variables in the study it also considered the effect of control variables. The study found out that individual investors at the NSE lacked adequate levels of financial literacy and as a results suffered from behavioral biases. Further the study established the existence of a strong positive relationship between financial literacy and behavioral biases .The researcher determined the coefficient of variation (R) which indicates the magnitude of the relationship between the study main variables. The resultant coefficient value was 0.760 which approached +1 implying the two variables had a strong relationship. In testing how the dependent variable varied as results of changes in independent variables, the study results yielded R Square coefficient value of 0.578 meaning according to the study 57.8% variation on behavioral biases was explained by financial literacy. The findings also revealed that financial literacy is a significant factor for explaining behavioral biases with P-value<0.05. The study recommends that various institutions should organize financial literacy education programs aimed at equipping the existing and potential investors with necessary financial knowledge. The study also recommend incorporation of financial literacy in Kenyan education curriculum starting from lower levels of education to ensure all individuals in Kenya who goes through the entire education systems are equipped with financial literacy skills

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ABBREVIATIONS AND ACRONYMS

CMA	Capital Market Authority
EGF	Equity Group Foundation
FL	Financial Literacy
FSD	Financial Sector Deepening
IPO	Initial Public Offer
KCB	Kenya Commercial Bank
NSE	Nairobi Securities Exchange
SEM	Structure Equation Modeling
SPSS	Statistical Package for Social Scientists
OECD	Organization for Economic Co-operation and Development
VIF	Variation Inflation Factor

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

The economic growth of a country majorly rely on how developed its financial industry is. Development of financial industry comes due to various financial innovations whose results is wide variety of financial products, services and more so features that eases their access. Emergent of financial products and services call for individuals to have the necessary knowledge and skills for enabling them to effectively assess and manage their financial choices and cleverly chose those that yields best returns. Simply, individuals are required to be smart or have requisite financial knowledge and skills for them to be successful and effectively manage their financial resources. The knowledge, skills and understanding of financial matters is what is referred to as financial literacy which Worthington (2005) described as an individual's ability to make sound judgments and taking of effective decisions regarding how to use and manage money. Financial literacy simply means understanding of key financial concepts (Remund, 2010). FL helps an individuals to understand the risks and returns associated to their financial decisions. Financially literate individuals cannot be easily deceived when making financial transactions since their decision are always arrived after considering relevant information. Studies have also revealed that financial literacy significantly determines household's prosperity as well as economic wellbeing. It is also paramount in assets growth through optimal portfolio formation (Guisso &Japelli, 2008).Study by Alessie et al. (2008) established that financial literacy directly link to stocks market participation and concluded that individuals who lacked or had low level of financial literacy do not

participate or contribute in the stocks market and if they do their participation is below that of those who are financially literate. According to Lusardi and Tufano (2009) financial literacy significantly affects individual's financial behavior. The study concluded that those individuals lacking, or with inadequate levels of financial literacy experiences problem in debts management.

Although various studies agrees that financial literacy is paramount whenever a question arises on how to make better financial decisions, it is not only the factor, instead other factors among them behavioral biases also affect individual's behavior. Behavioral biases leads to irrationality whose results is making of investment errors. Proponents of traditional finance and economics have ignored or termed behavioral biases as irrelevant in financial decision making and argued that decisions are made after available relevant information has been critically gathered and analyzed. But on the other hand studies have shown that even individuals considered to be smart in matters finance suffers from behavioral biases. Additionally studies have also proven that some specific behavioral biases that affect individuals depends on their level of financial literacy (Josef & Vera, 2017).

This research was anchored into two major theories namely; Prospect theory and Heuristics theory. Prospect theory states that human beings emotionally stick to the impact of a loss than a gain. This simply means that when a gaining situation is presented to a rational investor, he/she becomes risk averse and when faced with a losing scenario he/she becomes risk seeker, which is contrary to the normal expected behavior. Heuristics

theories state that human beings uses rule of thumb or mental shortcuts that help them in reaching quick and easy decisions. Even though the shortcuts are seen to be helpful, instead they can easily results to making of erroneous decisions. The most commonly heuristics to individuals during uncertainty are; representativeness, availability, and anchoring.

Since its formation the Nairobi Securities Exchange has grown tremendously to become one of the most vibrant securities market in the region in terms of listing and volume of shares traded. It is regulated by the Capital Market Authority of Kenya (CMA) Quarterly Statistical Bulletin (2018). As at December 2017, the NSE had 61 firms listed .The investment in securities of these firms is made up of two categories of investors; institutional and individual investors. The NSE updates investors daily through share index of 20 selected companies. It also provides daily trading statistics from Monday to Friday which includes: number of shares traded per day, top gainers and top losers.

1.1.1 Financial Literacy

Financial literacy is defined differently by different people. This is demonstrated by the varied definitions used in different literatures. To some, FL is defined as a broad concept which involves how individuals understand finance and its effect on household decisions. To others, FL simply means focusing on financial management concepts like how to budget, save, invest and protect against risk through insurance (Worthington, 2006). This study adopted a definition by Organization for Economic Co-operation and Development (OECD), (2012) which settled on the definition that financial literacy is the knowhow of

basic financial matters such as; risk diversification, budgeting and also acquisition of skills, motivation, and beliefs useful in decision making which promote individual as well as society well-being.

Financial literacy plays important role in individual's life due to its significance in terms of personal finance and entrepreneurial success (Huston, 2012).According to studies by Christelis et al. (2010); Yoong (2011), and Van Rooij et al. (2011) FL increases individual's chances of participating in the financial markets as well as investments in stocks. Similarly, Lusardi and Mitchell (2007; 2011) stated that being financially literate enables an individual to plan for future through investing or saving. Guiso and Viviano (2015) emphasized that highly financially-literate investors' mostly trade according to principles of finance and they are easily able to detect whenever a conflict of interest arises between them and financial intermediaries or brokers. Studies conducted have also shown that lack of financial literacy negatively impacts individual's behavior for instance; financially illiterate individuals find it difficult to accumulate wealth (Lusardi & Mitchell, 2010; 2014).Study by Shena et al. (2016) suggested individuals who do not have necessary financial skills always get engaged in financial disputes.

Researches done globally have continually revealed that levels of financial literacy amongst individuals are far below what is required both in high, middle and low income economies (Atkinson et al., 2007).Similar studies in Kenya, have also indicated that financial literacy levels remains very low in spite of the rigorous effort by the

government and other stakeholders to raise literacy levels amongst the citizens (Mbarire & Ali, 2014).

Financial literacy can be measured using two approaches; individual's self-assessments and study objective measure. By self-assessment approach, individuals are required to assess themselves on how financially literate they are and also give details of how they feel when making choices relating to finance. An objective way of doing this uses study objectives to design a study questionnaire which test how individuals understand financial terms and matters along with their ability to apply mathematical skills in financial scenarios (Mbarire & Ali, 2014). This research used an objective way to measure the level of financial literacy of individual investors at the NSE. The study also applied the work of Knoll and Houts (2012) and Lusardi et al. (2014) in developing a point scale adjusted to fit the objectives of the study whose questions covered both basic and advanced financial concepts like; time value of money, interest rates, inflation, investment management, debt management, retirement savings, life insurance, annuities, capital markets, risk diversification, and financial calculation and designed a 5-point Likert scale with questions modified to fit the study objective.

1.1.2 Behavioral Biases

Kahneman and Tverskey (1979) brought forward the role of psychology in explaining financial behaviors exhibited by individuals during financial decision making. They argued that psychological factors affect behavior as a results of behavioral biases which they defined as that which makes human beings behave irrationally when making

decisions either to buy or sell securities or when choosing amongst different financial alternatives. These biases occur due to inability to reason or by acting under influence of feelings (Manuel & Mathew, 2017). It can also be defined as those possible mistakes people commit in their decision making process (Josef & Vera, 2016).

Behavioral biases prevent individuals from exercising rationality in their financial choices (Barber & ordean, 2001; Kahneman & Riepe, 1998). Onsomu (2014) found investors' to be irrational, and linked this irrationality to heuristics within themselves. Heuristics included; herd behavior which defines individual tendency to follow crowd in decision making, believing that it is not easy for a group to make mistakes. Representativeness bias makes individual to consider sample to fully represent the parent population and assumes that any positive performance is likely to be repeated in future (hot hand fallacy) or believing that today's bad performance will be reversed tomorrow (gambler's fallacy). Availability bias investors behavior of buying securities which are easily recallable (Kahneman & Tversky, 1974). Status quo bias makes investor's to prefer maintaining current portfolio composition (Samuelson & Zeckhauser, 1988). Confirmation bias is exhibited by individuals who look for information that confirm their predetermined options (Shefrin, 2007). Disposition bias makes people to predict reversal in stock prices, making them to sell performing stocks and keep with them the non-performing stocks. Individuals also suffer over-confidence bias which makes them overestimate their mental ability, performance, level of control, or probabilities of success (Moore & Healy, 2008).

Behavioral biases can be measured using a questionnaire whose questions are designed into a five point scale whereby individuals express their opinion from 1 to 5 on each of the questions. Representativeness bias is measured by asking the respondents questions about how they buy or sell their securities. Availability bias by asking them to name the securities they prefer to purchase or invest in. Anchoring bias is measured by asking the investors to indicate their point of reference when buying or selling securities. Overconfidence is measured by asking questions on whether individuals make decisions based on their mental abilities. Regret Aversion is measured by asking questions that seek to know how an individual felt when they experienced loss for the first time and what was their view about losses. Herd Effect is measured by asking individuals to name their source of advice during investment decision making process.

1.1.3 Financial Literacy and Behavioral Biases

Traditional finance proponents see behavioral biases as irrelevant. However past researches have revealed that even the best financially literate individuals suffers from biases (Josef & Vera, 2016).findings from previous studies have shown that individual investors suffer from behavioral biases depending on how financially literate they are, which influences their financial decision making process. A study by Benartzi and Thaler (2007) established a resultant effect between being financially illiterate and suffering from behavioral biases. The study found that individuals' investors suffered herd effect bias as a results of low financial literacy whereby they relied from family members and colleagues for financial advice.

According to Rooij et al. (2011) individuals' financial literacy determines their participation in securities market. Those who lack FL shy away from participating in securities market. Studies by Guiso and Japbelli (2008); Abreu and Mendes (2010) have shown that individuals lacking financial literacy have problem in portfolio formation because of status quo bias effect. According to Josef and Vera (2016); Mauna (2015), the more an individual's becomes financially literate, the higher the possibility of becoming overconfident. This is because individuals with higher financial literacy actively participate or they are highly interested in stocks market due to the belief that they are more skilled than anyone else and they can outperform the rest in the market. The same way financial literacy can be useful in mitigating behavioral bias, studies have also shown that adequate financial literacy significantly influences individual's behavior by reducing the effect of some common behavioral biases affecting individuals who lacks financial literacy such as herd effect or availability bias (Disney & Gathergood, 2013)

1.1.4 Individual Investors at the Nairobi Securities Exchange

Since its formation, Nairobi Securities Exchange has grown tremendously becoming the fastest growing stock exchange market in sub-Saharan Africa. NSE has 1,200,175 individual investors comprising of local and foreign investors whom 1,196,422 have invested in equities and 3,753 in bonds (CMA, 2018).Kenyan government through Financial Sector Deepening (FSD) program has continued to educate people towards enhancing their financial freedom which aims at making them financially literate and improve their capacity to make informed financial decisions in terms of borrowing, saving and investing. The central bank also has been working through financial

institutions to increase public financial education by ensuring all commercial banks keep them informed about banks product and services as well as charges for easy comparison when making decisions. Equity Bank through its Equity Group Foundation (EGF) in partnership with Master Card Foundation and Kenya Commercial Bank (KCB) in partnership with Visa International have deliberated in educating Kenyans on financial matters and in educating Kenyans by imparting skills which seeks to improve their financial literacy and give them opportunity to learn about effective financial management. Additionally, NSE also conducts public education program aimed at ensuring investors and other stakeholders' are able to make well informed decisions which involves public education as well as stakeholders training.

Securities performance at the NSE in the recent past have been in excess of expectations. Oversubscription has been witnessed severally during the issue of IPOs by various companies' a good example being the issue by Safaricom limited in the year 2008. Such oversubscription was attributed to herd effect bias whereby several individuals subscribed not because they had enough information about the company but because everybody around them was buying. Similar scenarios have also been reported whenever there is a major corporate earnings announcement. For instance, when a company's performance is good and its share price goes up shortly, then falls due to disposition bias effect whereby investors owning shares of such a company rush to sell them when the prices are up in the fear of the reverse effect (Shikuku, 2014).

1.2 Research Problem

Financial literacy significantly impact investor's financial decision. It boosts investor's confidence for sound financial management (Jariwala, 2015). It significantly influences investors' wealth accumulation, portfolio diversification and help in selecting of better investment opportunities, in other word financial literacy improves investors' overall financial decision making (Jappelli &Padula, 2014); (Dimmock et al.,2016). According to Mauna and Anis (2016), a financially illiterate individuals is less likely to invest in securities.

Standard economic and financial theories assume individuals to be rational beings who considers all available information when making an investment decision (Aduda et al. 2012), However studies have shown that even the financially literate individuals who understand the financial concepts, their behavior sometimes deviates from these concepts when making their financial decisions (Josef & Vera, 2016). These abnormality in individual's behavior has been linked to behavioral biases which according to Kahneman and Riepe (1998),refers to as systematic judgment errors whose results is a mistake in terms of investment choices.

Studies have identified existence of a positive relationship between financial literacy and behavioral biases. Additionally, they have also shown that a person's degree of FL determines what kind of behavioral bias they suffer from (Benartzi & Thaler, 2007) ;(Ate et al., 2016) ;(Abreu & Mendes, 2010). In other word a link exist between financial literacy and a specific behavioral biases affecting an individual. According to

Josef and Vera (2016); Mauna (2015), an increased individual financial literacy leads to increased possibility of becoming overconfident over one's ability. Although these studies agreed on existence of positive relationship between the two, a study by Sezer and Demir (2015), gave a contradictory conclusion by stating that being financially literate does not link to any of the behavioral biases.

According to Mwangi (2012) level of financial literacy amongst the individual investors' at the NSE was low. Various studies have also shown that individual investors at the Nairobi Securities Exchange suffers from behavioral biases. A study by Werah (2006) aimed at establishing the influence of different behavioral biases on individual activities at the NSE found that individual investors at the NSE behaved irrationally evident by their disregard on fundamental principles of security trading which researcher believed was due to; herding effect, regret aversion, overconfidence and anchoring biases. Mbaluka (2008) established that behavioral biases affected individual investment decision because they were unwilling to change their portfolio easily. This was attributed to status quo bias. Study by Kisaka (2015) revealed that individual's investors at the NSE suffered from; loss aversion, regret aversion and framing biases. Waruingi (2011) established that herd effect, mental accounting, overconfidence, gamble's fallacy; anchoring and availability bias influences how individual's makes investment decisions at the NSE.

Existing literature on how financial literacy influences behavioral biases relates to countries with developed securities markets and also whose individual investors have

distinct demographics compared to Kenyan populace. Despite the findings by such studies that financial literacy and behavioral biases significantly influences each other, such findings cannot be relied in defining behaviors of individual investors at the NSE. This calls for a study on how the two variables relates and their effects on individual investors at Nairobi Securities Exchange to give an insight which will conform or differ from the empirical literatures and more importantly establish findings relevant to the local set up.

The differences in the securities market setup, countries economic status, use of different individual demographics by existing studies, inexistence of studies which directly addresses how financial literacy relates to behavioral biases that affect individual investors at the NSE and also greater variation on how the two variables have been discussed by various scholars justifies the need for conducting this study. The study therefore sought to address the identified gaps and also give an answer to the question: What are the effect of financial literacy on behavioral biases of individual stocks investors at the Nairobi Securities Exchange?

1.3 Objectives of the Study

The objective of this study was to determine the effect of financial literacy on behavioral biases of individual stock investors at the Nairobi Securities Exchange.

1.4 Value of the Study

The study will play a part in academia by expanding the already available literatures on individual financial literacy and behavioral biases which is useful to researchers and scholars in discussions and also for further researches seeking to explore more about financial literacy and its effect on behavioral biases.

To the policy makers, the study will make them understand the role of financial literacy on individual's financial decisions making and the behavioral biases likely to affect such individual's making them to behave irrationally. This will enable them to come up with financial education awareness programs targeting individual investors at the NSE which will enhance their financial literacy useful for their active participation and stock exchange market development and economic growth in the long run.

The study will be useful to finance and investment managers. The findings will make them understand the relationship between the two variables, which is financial literacy and behavioral biases. This will enable them to better understand their client who are the individual investors and be able to design the type of investments or advise them on how to form an optimal portfolio that will give them good returns. They will also understand the type of biases investors is likely to suffer from and be able to come up with mitigating measures to counter the bias effect.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Existing literatures about financial literacy along with behavioral biases was reviewed in this part. Literature review was covered into two sections, the theoretical and empirical review. Theoretical literature included the review of theories anchoring the study and their applicability. The empirical review covered studies by other scholars about the variables in this study. It also led to identification of research gaps in those studies. The chapter also included a graphical presentation of how study variables related; financial literacy, behavioral biases and individual investor's demographics named the conceptual framework which acted as a guide for the study and finally a chapter summary.

2.2 Theoretical Review

This involved explaining the theories that anchored the study and their applicability. The research was anchored into two theories; the prospect theory and the heuristic theories.

2.2.1 Prospect Theory

The work which led to the development of this theory was a critique of expected utility theory which for long times had been used in explaining how decision were made under risk or uncertainty by Kahneman and Tversky (1979). This theory explains those conditions which influences individual decision making process such as; mental accounting, loss eversion and regret aversion (Waweru et al., 2018).Regret is that feeling which comes after making a mistake. The fear of regret makes investors to hold loosing

shares and instead sell the winners. Studies by Forgel and Berry (2006); Lehenkari and Perttunen (2004) have shown that regrets effects makes investor's to holds non performing stocks and sell performing ones. Individual's feel or faces mental penalty due to loss aversion coming from comparable size of loss or gain (Berberis & Huang, 2001).According to Barberis and Thaler (2003) individuals becomes distressed when losing compared to the satisfaction they get when they are gaining. Barberis and Huang (2001) similarly stated that loss which occurs after a gains pains more than usual. Also loss following another loss results to even more pain. Study by Lehenkari and Perttunen (2004) found that past returns whether positive or negative has a possibility of increasing the negative relationship between the selling trend and capital losses of investors, suggesting that investors are loss averse. Risk aversion is assumed to be kind of behavior that every investor should have, nevertheless, it has a significant effect which means it can lead to bad decision which in return affect investor's wealth (Odean, 1998). Barberis and Huang (2001) defined mental accounting as the individual's way of thinking and evaluating of the financial transactions before them. In other words, it is those set of mental processes individuals prefer using in dividing their portfolios into distinct and non-transferable separate mental accounts (Barberis & Thaler, 2003; Ritter, 2003).

Prospect theory explains how an individual can frame and value uncertain decision and make a decision while considering its possible outcome which either a gain or loss at the same time referring to a specific point in life such as initial prices of a given security. Faukner (2002) supported the theory by saying that individual who uses this theory, adopts consequentiality approach; which means that when faced by a decision, the

possibility is they will be worried about the likely outcomes of their alternative choice. Specifically this means that alternatives are evaluated based on how probable and desirables the outcomes will be. The theory further states that any decision an individual makes or is about to make is normally coded either as gain or loss. The theory has practical application in this study by considering the way individual investor subjectively structures alternatives outcome or transaction in their mind which affect their expected utility this is because the alternative they will chose depends on what code they have assigned to it which can either be a gain or a loss (Kahneman, 1979).

2.2.2 Heuristics Theory

The theory was forwarded by Kahnmen and Tversky (1979) who defined heuristics as the rules of thumb used by individuals to make decisions whenever faced by a complex or uncertain situation. They argued that it's hard for the decision-making to be purely rational where all significant information is taken into consideration in decision making, rather individuals sometimes takes mental shortcuts. Heuristics include; representativeness, anchoring and overconfidence. Representativeness is a heuristic which makes investors to sell bullish stocks and avoid non- performing. According to DeBondt and Thaler (1995), investor's judgments' sometimes follows patterns that are simply random data and not representative of the facts instead in the ideal situation, events are considered as typical or representative of a well-known class.

Anchoring bias occurs when people set price scale (anchor) by relying on past observations. This is when investors use things like initial prices as reference point

whereby any reaction to market changes is always related to such initial purchase price (Kahneman & Riepe, 1998). According to Shiller (1998), individual determine today's prices by considering the past prices trend. Anchoring bias makes an investor to presume that a particular stock will continue trading in a defined range or expecting company's returns will follow some historical trends which makes them to either overreact or under-reaction. Due to anchoring effect, individual's form opinion about a situation and remain adamant even if new information's that may be significant to make them change their earlier made opinion exist. Overconfidence bias is a heuristic which makes an individual overestimate his/her mental ability making someone believe that their informational capacity is superior and they can outperform everyone in the market. Overconfidence makes one to become over optimistic on his/her ability. Studies have linked overconfidence bias to excessive trading (Evans, 2006; Allen & Evans, 2005). Individual investors especially those with financial knowledge and also finance professionals mostly exhibit overconfident in areas they believe to have knowledge.

Heuristics theory is applicable in this study because the three heuristics are mostly common biases which have been seen to affect individuals who lack financial literacy. Simply from the revealed literature it is clear the three heuristics have direct relationship with financial literacy.

2.3 Determinants of Behavioral Biases

Human beings at some point in life behave irrationally due to effect of behavioral biases which influences the way they make decision. Behavioral biases affect individuals as

results of a certain factor or lack of certain knowledge or skills in their life such as financial knowledge or their demographic factors.

2.3.1 Financial literacy

Financial literacy is below the required level in both developed and developing countries. Even what is termed as basic financial literacy is less than what is desirable making it is a worldly concern (Ates et al., 2016; Lusardi & Mitchell, 2011).Investors financial behaviors are significantly affected by their levels of financial literacy. Financial literacy improves investor's ability in financial management. It makes someone to gain confidence over his ability when making financial decision this confidence sometimes makes someone become overoptimistic resulting to a bias towards decision making. They put too much trust on their own information simplified as overconfidence bias effect which leads to losses (Japelli & Padulla, 2014). Overconfident makes one to fall pray of engaging in excessive trading and also investing in risky securities. Financial illiterate individual's shy away from investing in areas they are not familiar with. Instead they prefer investing in local companies or companies known to them even if they are not good for investing in (Sigh, 2012). Lack of financial knowledge makes investors to anchor (Tracer, 2007). Herding effect comes as a result of being financially illiterate and as a results relying more on others for financial decision.

2.3.2 Demographics

Studies have identified individual's social and economic factors to be amongst the factors that contribute to the kind of behavioral biases that affect them .Researchers have shown

that aged investors mostly suffer from representativeness bias, studies have shown that gender influences the type of biases that affect individuals' .According to Onsomu et al. (2015) men suffers more from anchoring and overconfidence bias than women. Similar study by Mishra and Metilda (2015) showed that there gender results to overconfidence bias. This is because according to the study findings, men seemed to be more overconfident than women. Individual's level of education has been shown to significantly results to representativeness bias, overconfidence and anchoring bias (Hassan et al., 2014).

2.4 Empirical review

Jonsson et al. (2017) examined how financial literacy, risk attitude, and saving motives affected decrease of mutual funds investors due to disposition bias. The study precisely focused on those individual personalities and sought to explain the investor's tendency to dispose stocks in non-performing mutual funds. The study made use of secondary data from the survey which had been done on 1564 Swedish household in 2013.Researchers used descriptive techniques to analyze the data .The hypothesis was tested considering three different portfolio composition and performance .The findings were, different levels of financial literacy affect reduction of deposition effect. Precisely the study found that individuals knowledge about mutual funds together with the current market condition affect the reduction of the disposition bias.

Onsomu et al. (2017) study sought to determine how demographics influences behavioral biases of individual investors at the Nairobi Securities Exchange .The study used a cross

sectional research design which was done in the year 2015. Sample for the study was 279 individual investors at the NSE. Analysis was done by use of ANOVA. The study found that men suffer most from behavioral biases than women. In terms of specific bias, gender and anchoring bias had a positive correlation. The study also concluded that there was no sharp different amongst the demographics in this case; age, education and investment experience and behavioral biases.

Ate et al. (2016) did a study on Turkish stock market and concluded that financial literacy determined the type of behavioral biases affecting individual investors which in turns affect the individual behavior and the type of financial decisions they make. The survey covered 596 households' investors and measured their level of FL and also what type of behavioral biases mostly affected them. It also sought to establish how the two variables related. Data collection was by use of questionnaire. The study adopted descriptive statistics and simple regression model for data analysis. According to the study almost half of the respondents' investors lacked financial literacy and they relied on information from peers/friends or their parents to make financial decision. Additionally high numbers of household investors suffered from behavioral biases. Although some of the biases found were seen not to result from individual's level of financial literacy, the study finally concluded that financial literacy significantly affected other behavioral biases.

Kubilay and Bayrakdaroglu (2016) did a study on the behavioral biases that influences investors' financial decision making process, investors financial risk forbearance and financial character. The study determined the existence of the relationship between

investors' character; behavioral biases and the degree of financial risk such investors were able or willing to tolerate. Data for the study was collected by use of questionnaires. The researcher's developed study hypothesis which was tested using of chi-square and regression. The findings were a significant correlation was present between investor traits and the types of bias likely affect them. Further the study concluded that personality traits also had an effect on the level of risk an individual investor was ready to tolerate or accept in any investment decision made.

Kimeu et al. (2016) studied to examine how psychological factors influenced individual's decisions on investment choices at the NSE. The study focused on determining how prospects, heuristics, herd effect and rationality factors affect individual's investment choices. The study targeted a population of all individual investors who had bought shares and bonds at NSE for the period up to the end of third quarter of the year 2015.The study randomly selected a sample of 80 respondents. The research used primary data. The data was obtained using closed ended questionnaires. Drop and pick technique was used in administering the questionnaire at offices of registered stock brokers. The researcher also used mail of the identified stocks investors to send the questionnaires. To analyze the data the researcher used both descriptive and inferential statistics. The findings were; investment decisions at Nairobi Securities Exchange were largely affected by behavioral factors.

Mauna and Amis (2016) did a study which was aimed at investigating what determines individual's financial literacy and what are its impacts on the investment choosing

behavior. The questionnaires were used to obtain data. These were given out to individual investors who visited the trading floor of the Tunisian Stocks Market; the research used a sample of 350 individual stocks investors. Data analysis was by use of Chi-Square tests and regression analysis models, the research found that individuals who lacked financial literacy rarely invested in the stocks market. They also concluded that investment in stock market in Tunisia was affected by demographics such as; age, education level and the individual income.

Onsomu (2014) study sought to establish the type of behavioral biases affecting individual investors at the NSE. The study also looked at establishing how behavioral biases correlate with individual's gender. By making use of questionnaires, the researcher aimed at collecting information from the individual investors at NSE. The study sampled 58 individual investors' of which 69% were male and 31% female. The study used descriptive statistics and Pearson Chi-Square test to analyze the data. The study concluded that individual investors at NSE suffered from behavioral biases such as; availability, representativeness, confirmation and disposition effect.

Shikuku (2013) did a research which investigated how behavioral biases affected individual investors' investment choices at Nairobi Securities Exchange. The study did a survey on all the individual investors' at the NSE which collected the primary data using questionnaires. Sixty three investors were selected across the twenty one licensed investments and brokerage firms which attained a 93.65% response rate. The study employed descriptive statistics and correlation analysis. It was established that factors

which determines individual investors' behavior at the NSE varies, for instance; herd effect, loss aversion, regret aversion, price variations, market information, past movements of stocks, overconfidence and anchoring all influenced the investors' behavior to a greater extent. Others like mental accounting had least significant effect on how individual investors' behave when making decision.

Bashir et al. (2013) did a study which was aimed at establishing how demographic factors and individual personality traits relate to behavioral biases that affected individual investors in Pakistan. Factors that were investigated by the study included; individual investor residency, age, gender, marital status, and education background. Individuals character such as; extraversion, frankness, meticulousness, neuroticism, and agreeableness were also considered. These were tested against psychological biases like; overconfidence, herding and disposition effect. The study used a sample size of 225 individual investors. Data was analyzed by use of Structure Equation Modeling (SEM). The study concluded that the relationship between the age, marital status, educational background and area of residence of investors and the behavioral biases was insignificant neither that of their risk taking attitude. Simply it meant that both individual behavioral biases and risk attitude were influenced by other factors but not the demographics.

Hon-Snir et al. (2012) did a research which sought to investigate how different individual investors in the Israel stocks market were affected by different behavioral biases. The study covered disposition bias, herd effect, availability bias, gambler's and hot hand fallacy in determining to what extent biases effected investors' decision on stocks market.

41 professional portfolio managers and 305 individual stocks investors were selected to form the study sample. The study concluded that experienced individual investors suffered least from behavioral biases. Similarly qualified portfolio managers suffered most from behavioral biases compared to non-qualified but veteran managers. The study also concluded that gender was a significant factor in studying behavioral biases because the study findings showed that female investors were less affected by biases as compared to their male counterparts.

2.5 Conceptual Framework

According to Mugenda and Mugenda (2003), this is an illustrative way to present the link between the study variables. The study highlighted behavioral biases as the variable that was dependent while the variable that was independent was financial literacy; control factors were the demographic characteristics. The study aim was to determine how the two variables; the independent and dependent variables related which was to be established by asking the respondents relevant question relating to the two variables of the study; the financial literacy and behavioral biases this study sought to investigate which were; overconfidence bias and herd effect bias affecting individual investors at the NSE. Individual investor's demographics which the researcher believed influenced how individuals made decision was also measured.

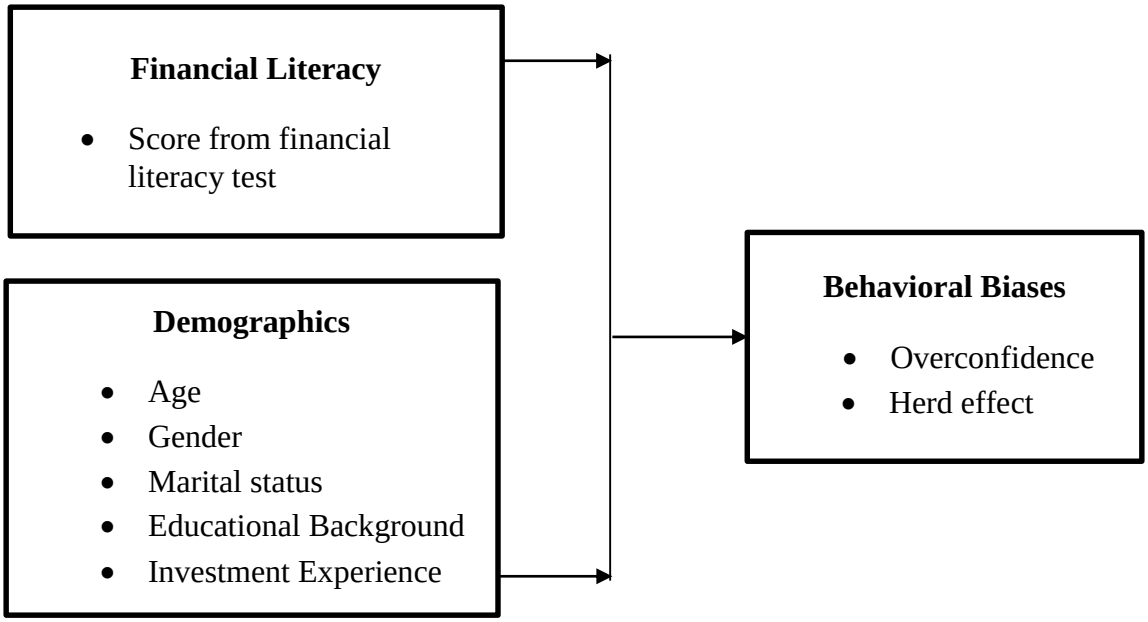

Figure 2.1: Conceptual Framework (Author, 2018)

2.6 Summary of Literature review and Research gap

Empirically studies have shown that individual's investors suffers from behavioral biases as a result of multiple factors among them their level of financial literacy. Empirical evidences have shown that financially literate person rarely makes mistakes in their financial decisions compared to those who are financially illiterate concluding the existence of relationship between financial literacy and individual behavior. Other studies have also linked financial literacy to specific bias. The varied findings from the reviewed literatures is what motivated the researcher to look into the identified gaps and determine how they could be bridged by applying the findings of this research which aimed at determining the effect of financial literacy on behavioral biases of the individual investors at the NSE.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the research design the researcher had to carry out the study with, along with the targeted population, sample size, data gathering, and analysis methods. It also address the issues of reliance and validity placed on the study. It also presents operationalization about the different variables and the test of significance.

3.2 Research Design

The study made use of descriptive research design. The methodology was adopted because of its usefulness in studies seeking to describe behaviors or characteristics of the population under study (Cooper & Schindler, 2011). The design fitted well in this study due to its suitability in bringing out information which is difficult to measure using observational methods. Further, the design was believed to be dependable and valid in terms of collecting and analyzing of data and also in generalization of the study findings.

3.3 Population of the Study

Mugenda and Mugenda (2009) described ‘population' as the entire group of people or objects with common observable characteristics the researcher is seeking to study and use the findings in generalizing the research objectives. The targeted population for the study were all the individual shareholders at the NSE .There were about 1,200,175 as at 31st July 2018 (CMA, 2018).

3.4 Sample Design

Sampling design involves sampling technique and the sample size. Study used a sample of 100 individuals randomly selected from the population of 1,200,175 individual investors at the NSE. The study used simple random sampling technique whereby amongst individual investors who visited the offices of the 24 registered stock brokers between 3rd and 20th September 2018, 100 were randomly picked to form a study sample. In sample selection the researcher assumed the population was highly homogeneous. To arrive at the sample of 100 individuals, the researcher adopted a formula by Kombo and Tromp (2009) which uses a covariance of 0.3. The formula was as shown; the study accepted a margin of error of 3%

$$\boldsymbol{n = \frac{NC^2}{C^2 + (N-1)e^2}}$$

Where;

n = the desired sample size

N =is the population size

e = is the level of precision assumed by the researcher

C=Covariance of the variables (0.3) or 30%

Substituted as below;

$$\boldsymbol{n = \frac{1{,}200{,}175 * 0.3^2}{0.3^2 + (1{,}200{,}175-1)0.03^2}} = \frac{108{,}015.75}{1080.2466} = 99.9975$$= rounded off to 100 respondents

3.5 Data Collection

Primary data was used for the study because the former gives applicable and recent information regarding the topic of study. The data was obtained using questionnaires.

Past research by Mwangi (2017) and Njuguna (2017) was used to adopt the research questionnaire with modifications aimed at addressing the study objectives. The questionnaire was structured into two parts: Part one addressed the individual profile of the respondents, simply the demographics. Part two included questions whose content covered the two variables of the study. The questions were developed into a five point scale with 1 indicating strongly disagree and 5 representing strongly agree. The researcher visited the registered stock brokers' offices between 3rd and 20th September 2018 and administered the questionnaires on 5 randomly selected individual investors who paid visits to the offices of the brokerage firms between this duration. The two week period was enough to attain the required sample size of 100 individual investors. On average 5 questionnaires were administered in each of the 24 stocks brokerage firms offering financial services as at 31st July 2018.

3.6 Reliability and Validity Tests

Reliability test was done to determine whether the designed questionnaire was consistency in terms of yielding similar results if administered severally (Crocker & Algne, 1986). Reliability tests was done to check the internal consistency of the questions against the test items and see whether the results could be replicated. Study questionnaire was examined for reliability by checking Cronbach's Alpha Coefficient of variables in the study. The rule of thumb is, if the obtained coefficient value is 0 there is no consistency and 1 means total consistency. In other word, the more the coefficient tend to approach 1 the more reliable the scale is. According to Nunnaly (1978); Nunnaly and

Berstein (1994); Bland and Altman (1997) a coefficient of 0.7 is considered reliable. This study considered coefficient of 0.7 to be reliable.

Validity of an instrument simply means its ability to measure the construct as purported (Manaf, 2012). It is concerned with the accuracy of the inferences. The researcher ensured construct validity by developing the study questionnaire based on other questionnaires used in prior studies and modifying it in line with the study objective. Validity of content was safeguarded through guidance from the university's supervisor who ensured during various presentations and cross checking of study work the theoretical dimensions of study was captured in the instrument as conceptualized.

The researcher did a pilot test of the questionnaire which was aimed at checking and improving its suitability for the proposed study. This was through administering it to 10 randomly selected individuals' investors at the offices of the registered stocks brokers with offices at Mombasa County. The process was also aimed at checking how understandable the study questionnaire was by the respondents. The aim was to check the possibility of any ambiguity prior to gathering the actual data for the study. Based on whatever feedback was obtained, the questionnaire was reviewed and corrected accordingly. After data collection, returned questionnaires were strictly cross checked to ensure completeness and consistency.

3.7 Data Analysis

The researcher checked all the returned questionnaires for completeness. Data from questionnaires were then cleaned, edited and coded for inputting in the SPSS. Data analysis was done by use of both descriptive and inferential statistics. Descriptive analysis comprised of frequencies and percentages. Inferential statistics involved use of regression and correlational analysis. The assumptions of regression were also tested to check whether they were met. This involved tests for normality, multicollinearity, and homoscedasticity. Normality test was done using Shapiro-Wilk test and Kolmogotov-Smirnov tests; multicollinearity test was done using Variance Inflation Factor while homoscedasticity was tested using Levene's test. Correlation of variables was also tested using the Coefficient of variation which tested the nature of relationship between variables. Coefficient of determination (R^2) simply named as R squared was used to explain the degree of variation of dependent variable as a result of changes in the independent variables. Finally the model for study was tested for significance by checking the P-Value whereby a value of less or equal to 0.05 ($P \leq 0.05$) indicated a significant model.

The study used simple linear regression analysis model in determining how the two main variables related; the financial literacy and the behavioral biases of individual stocks investors' at the NSE. The researcher expected a regression model as shown:

$$\mathbf{Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta 4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon}$$

Where: Y is the dependent variable and X_1 is the independent variable

X_2, X_3, X_4, X_5 and X_6 -denoting the control variables

β_1, β_2, β_3, β_4, β_5 and β_6 -coefficients of the predictor variables

α- Constant

ε - The error term

Y – Behavioral biases

X_1-Financial Literacy

X_2-Age, X_3-Gender, X_4-Marital Status, X_5-Education level, X_6-Investment experience

3.7.1 Operationalization of Variable

This section describes the operationalization of the research variables as shown in the conceptual framework model. Operationalization is whereby the researcher gives a definition to the study concept that can be observed and measured.

Table 3.1 Operationalization of Variables

Category	Study variable	Operational definition	Measurement
Independent Variable	Financial Literacy	Knowledge about financial market, instruments and financial concepts	Likert Scale 1-5
		Understanding of financial calculations and financial numeracy	Likert Scale 1-5
Dependent variables	Overconfidence Bias	How do individuals rate their mental ability of understanding	Likert Scale 1-5
	Herd Effect Bias	Testing whether investors follow others action	Likert Scale 1-5
Control Variables	Demographics	Age	Number of years
		Gender	Male or female
		Marital Status	Single or Married
		Level of Education	Primary, Secondary Diploma, Graduate, Postgraduate
		Investment experience	No of years participating in securities market

Source: Research findings 2018

Table 3.1 shows the operational definitions of the study variables as used by the researcher. Operationalization enables the researcher to measure the variables quantitatively. It defines the concept so as to make the theoretical concept clear and easy

to distinguish or measure and also understand it in terms of empirical observations (Zikmund, 2003).Table 3.1 presents the study variables and their operational definitions.

3.7.2 Tests of Significance

To determine the significance of the research, inferential statistics were used in determining the extent of the relationship. The significance of the correlations was measured by use of correlation coefficient (R) whose value ranges from -1 to +1. The coefficient measures the extent of relationship between the two sets of variables, whereby a higher coefficient approaching +1, implies a strong association between the variables under study. The coefficient also determines whether the two variables are positively or negatively correlated with the value above 0 value meaning the two are positively related while that below 0 indicating that the two are negatively correlated. Implying that whenever there is a positive change of the predictor variable, the dependent variable changes in the same direction but the change depends on the degree of correlation between the two and vice versa. The co-efficient of determination (R^2) measures that change by the dependent variable which occurs as a result of change by the independent variable. Simply interpreted as the higher the value of R^2 the more reliable the model was. The significance of the overall model was tested by use of F-test. The F-test indicates whether the R^2 will have just occurred by chance or not. For the model to be termed significant, The P-value of F-test should be >0.05 at 95% confidence interval.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND PRESENTATION

4.1 Introduction

This part involved a discussion around response rates and regression diagnostic tests. It also provided general information about the respondents which the researcher analysed through the use of descriptive statistics. The outcomes were presented in form of tables of frequencies and percentages. The chapter also presented the results of correlational analysis of the study variables and finally the development of the study model obtained from regression analysis.

4.2 Response Rate

The researcher used a sample 100 individual investors. Out of the 100 individuals only 76 accepted to answer the research questionnaire translating to a 76% rate of response from the selected sample of 100 individual investors at the NSE. The response rate of the study is termed adequate if it is 50%, good if it is 60% and excellent if it's above 70% (Mugenda & Mugenda, 2008). The obtained response rate of 76% was therefore excellent and appropriate for analysis.

4.3 Reliability and Validity tests

4.3.1 Reliability Tests

Data collected was tested for reliability to check the internal consistency of the research instrument. This was by determining the Cronbach's Alpha coefficient of the independent

variables which test how reliable the study questionnaire is. For this test to hold, the study assumed a threshold coefficient value of 0.7 as suggested by Nunnaly (1978).

Table 4.1 Reliability Test Statistics

Cronbach's Alpha	No of Items
.782	6

Source: Research findings 2018

Table 4.1 illustrates the test results of Cronbach's Alpha for the study whose Alpha coefficient was 0.782 which was above the 0.7 coefficient recommended by Nunnaly (1978) concluding that the research instruments was reliable.

4.3.2 Validity Tests

The researcher during various presentations and consultation before the university supervisor sought to improve the validity of the research instruments. The feedback was used to revise the questionnaire and modify it to achieve the desired degree of validity. The researcher also did a pilot study before the final data collection was done which pre-tested the questionnaire to ensure its relevance on the study objectives. Pilot study was done to help in determining whether the research questionnaire was appropriate for final data collection. The process helped in checking the possible ambiguities in the questionnaire and correcting them before the main study was done.

4.3.3 Regression Diagnostics Tests

4.3.3.1 Normality

Data is said to conform to normality if it is symmetrically distributed around the center of all scores (Field, 2009). The researcher used Shapiro-Wilk test to test for normality because according to Field (2009), a study whose sample falls between 3 and 2000 items, Shapiro-Wilk test is used and for that which sample exceeds 2000 items Kolmogorov-Smirnov test is recommended. For data to be said to have passed normality test, Shapiro-Wilk test and Kolmogorov-Smirnov test should be insignificant. Table 4.2 shows the coefficient of Shapiro -Wilk test value obtained was greater than 0.05 (P=0.955) and therefore insignificant (P>0.05) concluding the study data adhered to the rules of normality.

Table 4.2 Tests for Normality

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig**
Behavioral Biases	.159	76	.200	.955	76	.777

Source: Research findings 2018

The researcher also performed other tests of normality by determining the forms of distribution of the study data, this was by performing the Skewness and Kurtosis tests. The purpose was to determine the extent at which the two tests results were far from normality. Data is said to be normally distributed if its Skewness test results ranges between ±1.96 and its Kurtosis value is zero. The study findings obtained Skewness

coefficient value of 1.194, and Kurtosis value equal to 0 all falling within the above range implying that the data was positively skewed and normally distributed.

4.3.3.2 Homoscedasticity

Homoscedasticity refers to the extent at which the data value for the independent and dependent variable have equal variances (Hair et al., 2010). Data with unequal variances results to heteroscedasticity which violates the assumptions of regression of the existence of equal variances. The researcher tested homoscedasticity by use of Levene's test. The results of homoscedasticity test indicated that error differences of the independent variables was insignificant.

Table 4.3: Levene's Test of Equality of Error Variances

Levene's Statistic	df1	df2	Sig.
1.767	73	2	.430

Source: Research findings 2018

The rule of thumb for the homogeneity assumptions to hold is that the Levene's test statistic value should be insignificant (P<0.05). Table 4.3s shows that P> 0.05 (P=0.430) hence insignificant.

4.3.3.3 Multicollinearity Test

The test is done to determine the level of correlation amongst the predictor variables in the study. Basically any correlation should be between the dependent and the independent variables and not between the predictor variables themselves meaning correlation

amongst predictor variables should be as low as possible (Hair et al., 2010). The test is done by determining the variables Variance Inflation Factors (VIF) and variables tolerance values.

Table 4.4: Multicollinearity Test

Independent Variables	Tolerance	VIF
Financial Literacy	.568	1.759
Age	.581	1.720
Gender	.744	1.343
Marital Status	.763	1.310
Education	.421	2.376
Investment Experience	.623	1.606

Source: Research Findings 2018

Table 4.4, displays the results that were obtained by the researcher with test coefficients ranging between 0.421 and 0.763. According to Gujarati (2005), a high VIF values implies existence of multicollinearity problem and on the other hand a tolerance value of 0.1 or below indicates possibility of multicollinearity. According to the study findings, tolerance values were all above 0.1 threshold and also VIFs coefficients were far much below the set bench mark of 10 by O'Brien (2007) concluding there was no multicollinearity amongst the predictor variables.

4.3.3.4 Auto-correlation test

The researcher performed a Durbin-Watson test which is done to establish whether the residuals from regression are independent and not auto correlated. Its measure should ranges from 0 to 4 with a value of 2 suggesting no auto correlation, a value approaching 0

indicating positive correlation and that approaching 4 indicating negative correlation. Table 4.5 shows the study Durbin-Watson coefficient was 1.998 which was within the acceptable range of 0 to 4. Additionally the value approached 2 meaning there was no autocorrelation.

Table 4.5 Test for Auto Correlation-Durbin-Watson

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.760[a]	.578	.542	.46941	1.998

Source: Research findings 2018

4.4 Descriptive Statistics

This section explained the demographic information of the individual investors at the NSE which the researcher used as the control variables; the age, gender, marital status, level of education and investment experience of the respondents.

4.4.1 Age of the Respondents

The study required the respondents to indicate their age. The purpose was to check whether individual's age had significant influence on the way they responded to the questions on the study variables. The results were obtained as displayed in the Table 4.6 which indicated that 96.1% of those who responded aged between 18 and 55 years, 3.9 % above 55 years. The findings also showed that 67.2% of the individuals who responded to the study questionnaires, were aged between 26 -55 years, 3.9% were above 55 years and remaining 28.9% were below 26 years. These findings implied that majority of

respondents who visited the stock brokerage firms were within the working population age and more specifically youths.

Table 4.6: Age of the Respondents

Age Brackets (Years)	Frequency	Percentage
18-25	22	28.9
26-35	16	21.1
36-45	30	39.5
46-55	5	6.6
Above 55	3	3.9
Total	**76**	**100.0**

Source: Research findings 2018

4.4.2 The Respondents' Gender

The aim was to discover whether there was a gender variation amongst individual investors who visited the stocks brokerage firms' offices during the time the study was being conducted and also amongst those who agreed to fill the study questionnaire.

Table 4.7: The Respondents' Gender

Gender	Frequency	Percentage
Male	57	75.0
Female	19	25.0
Total	**76**	**100.0**

Source: Research findings 2018

The researcher test on gender gave results shown in the Table 4.7 which revealed that majority of those who visited the offices of the stocks brokerage firms were male implying that dominant gender at the Nairobi Securities Exchange were male.

4.4.3 Respondents' Marital Status

The researcher required the respondents to indicate their marital status. This was to determine whether it influenced the way they answered study questions on financial literacy and behavioral biases. It also sought to know the distribution of individual's investors at NSE in terms of their marital status.

Table 4.8: Respondents' Marital Status

Marital Status	Frequency	Percentage
Married	58	76.3
Single	18	23.7
Total	**76**	**100.0**

Source: Research findings 2018

The findings shown in Table 4.8 illustrated that 76.3% were married and 23.7% single. This meant that majority of the individual investors who visited the offices of stock brokerage firms during the study were married individuals.

4.4.4 Educational Background of the Respondents

The researcher wanted to establish respondent's educational background. Results as shown in Table 4.9, indicated that 35.5% were graduate, 21.1% had attained primary education, 13.2% secondary education, 19.7% diploma and 10.5% indicating that they had attained post graduate level. The study concluded that a large number of the respondents had attained at least some level of education believed was enough to understand the content of the study questionnaire and concepts pertaining to financial

literacy and behavioral biases affecting them while trading at the Nairobi Securities Exchange.

Table 4.9: Educational Background of the respondents

Level of Education	Frequency	Percentage
Primary	16	21.1
Secondary	10	13.2
Diploma	15	19.7
Undergraduate	27	35.5
Post graduate	8	10.5
Total	**76**	**100.0**

Source: Research findings 2018

4.4.5 Investment experience

The researcher enquired to know how experienced the respondents were in terms of investments and securities trading. As shown in Table 4.10, the researcher found that 93.4% were experienced with 61.8% being more experienced while 31.6% being moderately experienced. Additionally the findings indicated that 6.6% of the respondents had no experience

Table 4.10: Investment experience

Investment Experience	Frequency	Percent
More Experienced	47	61.8
Moderate	24	31.6
No Experience	5	6.6
Total	**76**	**100.0**

Source: Research Findings 2018

4.5 Correlation Analysis

The Pearson Product-Moment Correlation analysis was done to test if there was any relationship between the study variables and also to establish their direction of the relationship.

Table 4.11 Correlation Coefficients of Independent and Dependent Variables

		Behavioral Biases	Financial Literacy	Age	Gender	Marital Status	Education	Investment Experience
Behavioral Biases	Pearson Correlation	1	.746	.413	.082	.158	.481	.208
	Sig. (1-tailed)		.000	.000	.240	.087	.000	.036
	N	76	76	76	76	76	76	76
Financial Literacy	Pearson Correlation	.746	1	.508	.245	.310	.638	.379
	Sig. (1-tailed)	.000		.000	.017	.003	.000	.000
	N	76	76	76	76	76	76	76
Age	Pearson Correlation	.413	.508	1	.287	.303	.620	.412
	Sig. (1-tailed)	.000	.000		.006	.004	.000	.000
	N	76	76	76	76	76	76	76
Gender	Pearson Correlation	.082	.245	.287	1	.322	.362	.469
	Sig. (1-tailed)	.240	.017	.006		.002	.001	.000
	N	76	76	76	76	76	76	76
Marital Status	Pearson Correlation	.158	.310	.303	.322	1	.416	.400
	Sig. (1-tailed)	.087	.003	.004	.002		.000	.000
	N	76	76	76	76	76	76	76
Education Background	Pearson Correlation	.481	.638	.620	.362	.416	1	.494
	Sig. (1-tailed)	.000	.000	.000	.001	.000		.000
	N	76	76	76	76	76	76	76
Investment Experience	Pearson Correlation	.208	.379	.412	.469	.400	.494	1
	Sig. (1-tailed)	.036	.000	.000	.000	.000	.000	
	N	76	76	76	76	76	76	76

Source: Research findings, 2018

Table 4.11 presented the correlation coefficient matrix of the independent and dependent variables. The results for the correlation between behavioral biases and FL was high and statistically significant ($R=0.746$, $P<0.05$). Amongst the control variables, correlation between individuals' level of education and age was positive with coefficients $R=0.481$ and $R= 0.413$ respectively. The correlation coefficient between behavioral biases and investment experience and marital status was also positive but weak with a coefficient of 0.208 and 0.158 respectively indicating a weak correlation. Gender had a coefficient of 0.082 indicating lack of correlation since its value approached 0. Although all the independent variables showed a positive correlation with the behavioral biases , financial literacy, age and level of education indicated strong positive correlation, also in terms of significance they were all significant with P-value <0.05.

4.6 Regression Analysis

The researcher used simple linear regression analysis to come up with the study model for showing the type of the relationship that existed between the independent and dependent variables in the study. The aim was done to determine if a significant relationship between the independent and the dependent variables of the study existed. The analysis of study findings generated a regression model whose coefficients were as shown in Table 4.12:

$$Y = 1.607 + 0.711X_1 + 0.049X_2 -0.142X_3 -0.101X_4+0.025X_5 -0.069X_6 + \varepsilon$$

Table 4.12 Regression Coefficients for Independent Variables on Behavioral Biases

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.607	.268		5.998	.000
	Financial Literacy	.711	.100	.741	7.145	.000
	Age	.049	.065	.077	.754	.453
	Gender	-.142	.144	-.090	-.988	.326
	Marital Status	-.101	.145	-.063	-.699	.487
	Education	.025	.063	.049	.404	.687
	Investment Experience	-.069	.111	-.062	-.624	.534

Source: Research findings 2018

The model revealed that holding both the independent and the control variables constant or at zero, individual investors at NSE will still suffer certain level of behavioral biases as indicated by the model value of 1.607 (constant). This meant that individual's investors at NSE were still affected by behavioral biases regardless of the effect of the predictor and control variables the researcher studied. The coefficient (β=0.711,P<0.05) representing financial literacy denoted that other variables held constant or at zero a change in financial literacy of the magnitude of 0.711 led to a unit change on behavioral biases of an individual investor. Additionally FL significantly affected the behavioral biases of individual investors. Other factors held constant, investor's age affect their behavioral biases but by a lower magnitude with the coefficient of (β=0.049) .The findings also showed that individual's level of education with other factors held constant or at zero, the change of their level of education of magnitude (β=0.025) will change their behavioral bias by a unit. The model revealed existence of a positive relationship between individual financial literacy, age and level of education with behavioral biases since all the three

variables had positive slope (β=0.711, β=0.049 and β=0.025) respectively meaning a positive change in either of the variables brings about positive change in individual's behavioral biases. Individual investor's Age, gender, marital status and investment experience showed a negative relationship with behavioral biases meaning their change affected behavioral biases but in an opposite direction. In summary the findings are, financial literacy had the highest influence on behavioral biases affecting individual investors at the NSE (β=0.711, P value<0.05) followed by age, and level of education (β=0.049) and (β=0.025).

Table 4.13: The Model Summary for Behavioral Bias

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.760[a]	.578	.542	.46941

Source: Research findings 2018

Table 4.13 shows a summary of the regression model. As shown in the model the coefficient of correlation was 0.760 indicating that there is a strong positive relationship between the financial literacy and behavioral biases. The implication is that the obtained model was reliable and could be applied in determining the relationship between financial literacy and behavioral biases affecting individual investors at the NSE. The above was enhanced by the R square coefficient (R^2) which explains how the dependent variable varies whenever there is a change in the independent variables. As shown in Table 4. 13, the model R squared (R^2) was 0.578. This meant that 57.8% of the variation in the behavioral biases according to the study could be explained by variation of the

independent variables covered. On the other hand 42.2% variance could only be explained by other independent variables which weren't studied.

4.7 Discussion of the Research Findings

The study found that FL was positively correlated to behavioral biases. Additionally it was also a statistically significant predictor of behavioral biases (β=0.746, $P<0.05$), meaning a change in level of individual's financial literacy led to a positive change in behavioral biases agreeing with the research by Ates et al. (2015) which found that FL had positive relationship with the behavioral biases. The study is also supported by the works of Bucher-Koenen and Ziegelmeyer (2011), who concluded that individuals with inadequate financial education and mental ability are more exposed to behavioral biases which lead to making of investment mistakes. On contrary the study by Sezer and Demir (2015) concluded that no correlation existed between investors' behavioral biases and their level of financial literacy.

The research test on demographics of individual investors to determine their effect on the behavioral biases showed that investors' age and level of education both were positively correlated with behavioral biases (β=0.481) and (β=0.413) respectively in terms of significant both were found to be insignificant with their $P>0.05$. This meant that the more educated an individual was the higher the chances of being affected by behavioral biases. In other word individuals who highly educated are more prone to behavioral biases than uneducated ones. Same to individual investors' age which was also found to be positively related to behavioral biases which implied that individual age affects their exposure to behavioral biases, meaning as someone advances in age his/her exposure to

behavioral biases increases. This is explainable by the fact that older people does a lot of consultation and also they are always very careful compared to young people. Age also results to some level of experience about some phenomenon which when faced with similar situation in life they recall or like to relate the current phenomena with what they know which can be due to behavioral biases.

The study found that individual investors gender, marital status and investment experience were have a negative relationship with behavioral biases meaning a change of any of the factors led to a change but in opposite direction of behavioral biases, in other word when any of the above factors changes either by increasing or decreasing individual investors biases change but in an opposite direction. They were also found to be insignificant with $P>0.05$. Investors' gender on the individual biases, the results indicated that gender had no effect on behavioral biases meaning males and females were affected similarly. Investors' marital status was also found to have a negative relationship with behavioral biases ($\beta=-0.101$, $P>0.05$) and because majority of the respondents were male, this implied that male investors were least affected by behavioral biases. It was also found that marital status was insignificant variable. Despite the findings showing majority of the respondents having adequate investment experience, it was found to be negatively related to behavioral biases ($\beta=-0.069$) and also insignificant (p-value > 0.05). Meaning the more experienced the investor the lower the effect of behavioral biases and vice versa. The above findings on individuals demographic agrees with a study by Bashir et al. (2013) which concluded that individuals age, gender, marital status didn't have any influence on behavioral biases affecting individual investors.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section summarizes the entire study. It also concludes the study by providing a discussion on general findings of the research, recommendations by the researcher, limitations faced by the researcher during the study and finally suggesting for further researches.

5.2 Summary of findings

The research used descriptive research design. Individual investors at the NSE were the target population for the study. To ensure that the sample chosen was substantially representing the population, the researcher used simple random sampling in selecting the respondents from the individual investors who visited the offices of registered stocks brokerage firms when the study was being done. Primary data was collected using questionnaires. Data analysis involved coding and inputting into Statistical Packages for Social Scientists (SPSS Version 20.0).

To establishing how the independent and dependent variables of the study related, the researcher used simple regression analysis. The results of the regression analysis was a study regression model which found that financial literacy had a positive relationship with behavioral biases. The findings revealed that individual investors were financially literate and most of those interviewed were knowledgeable in both basic and advanced finance concepts. The study analysis of individual investors' demographics gave a results

which showed that most of those who responded to the study were aged between 18-45 years and they were male. The study also found that most of the respondents were married individuals. In terms of education status the study established that on average respondents' had attained at least a post-secondary education and they had adequate investment experience. Individual investors' demographics showed variation on how they related with behavioral biases with age and level of education showing positive relationship while gender, marital status and investment experience of respondents showing negative relationship. In terms of variables significance financial literacy was found to be significance while all demographics were insignificant.

5.3 Conclusion of the Study

The researcher sought to establish how financial literacy affected behavioral biases of individual investors at the NSE. According to the results obtained from the study, the researcher concluded that financial literacy significantly affected behavioral biases of the individual investors at the NSE. Additionally the findings revealed that there was a solid link between the two variables. It was also concluded that levels of FL at the NSE were not adequate because the composite score of the questions testing on the understandability of the financial concepts by the respondents was neutral meaning the number of respondents who disagreed or agreed with the concepts the study was testing were equal, or the respondents weren't sure of the concepts and in that case they chose to be neutral.

According to this study findings, the researcher conclusion was that financial literacy was the most significant factor in determining the behavioral biases that affects investors at NSE, followed by investor's age and level of education on the other hand gender, marital status, and investment experience influence on the behavioral biases affecting was not significant. The study also revealed that most of the respondent (68%) were below 45 years suggesting that they were youthful and working which is a good indicator to the NSE since with an increasing number of youth participating in securities market, it is an indication of increased economic productivity .

5.4 Recommendations of the Study

The findings of the study have revealed financial literacy to be a significant factor in determining behavioral biases affecting individual investors at NSE. Since behavioral biases have been confirmed by this study and other empirical studies to affect the behavior of individual investors at NSE, The study then recommends that NSE should come up with educational programs targeting existing and potential investors which will enhance their financial literacy making them able to make better investments decisions free from behavioral biases. This will improve the decisions investors make and reduce the suffering they undergo as a results of bad investment decisions made under influence of behavioral biases.

According to the study, the researcher recommends that the Kenyan government should look into how to address the financial literacy inadequacy levels in the entire populace and come up with policy that will ensure trainings on financial matters begins in all

schools starting from lower levels whereby students going through Kenyan education system starting from primary level will have a chance to study finance related subjects which will instill financial knowledge necessary for improving individual's financial behaviors and be able to save and invest wisely at a tender age, which will not only improve individual's mastery levels in wealth accumulation, but also foster economic growth in the long run.

Study findings have shown that there is gender parity on the individual investors whereby majority of the investors were found to be male. The study therefore recommend that NSE to conduct an awareness campaign targeting women and other marginalized groups in the society which will make them informed about securities market and the operations of NSE this will increase their number at the NSE hence increasing the overall number of individual stocks investors at the NSE which is lower compared to Kenyan population.

5.5 Limitations of the Study

The researcher identified some challenges encountered during data collection. These included some of the respondents unwilling to give background information which they considered confidential. It is a common behavior for the people to feel that revealing some information that shows inadequacies in understanding of a particular concepts can be embarrassing and in this regards individual investors might have answered some questions not because they understood them but for fear of being seen like they don't understand the concepts the research was testing. The researcher maintained that role of a researcher and let the individual fill the questionnaire alone.

Some respondents were uncomfortable in giving information about their age, level of education, and marital status, meaning the respondents who filled the study questionnaires may have been dishonest in their answers, to remove this doubt, the researcher ensured them of the confidentiality of their information being gathered and kept reminding them that the information was purely for academic purpose and not to be used for any other purpose which was also confirmed by the introduction letter the researcher had gotten from the university before the research was started.

The research was done only in Nairobi because it is where offices of the registered stock brokers are. The researcher opined that it would have been better for the respondents to be drawn from across the country which would have increased the representation of the individual investors in this study leading to much reliability and consistency of the data. This couldn't be achieved due to time and financial limitation. To overcome this the researcher ensured that probabilistic sampling was done to at least get a sample which was to a large extent not biased.

5.6 Suggestions for Further Studies

The study focus was on the individual investors in Kenya and how their financial literacy levels influenced behavioral biases affecting them but looking at the composition of investors at the NSE, it can also be grouped differently into other sub-groups of investors like local, foreign investors' and also organizational investors. The researcher therefore recommend that a study need to be done based on such groupings whose findings will be

used for comparing and establishing whether there is consistency in the results on the kind of the relationship that exist about financial literacy and behavioral biases amongst the respondents in those groups of investors.

The researcher studied FL and behavioral biases of individual investor at the NSE and aimed at establishing the type of relationship that existed between the two. The researcher has the opinion that similar studies should be conducted testing the effect financial literacy has on other aspects of investors life such as investment, saving and risk diversification which will enable the understanding of the critical role financial literacy has on individual investors life and how the same affect the economy of a country.

The study questionnaire section on financial literacy tested both basic and advanced financial concepts such as; time value of money, inflation, financial instruments among others. The researcher suggest that because financial literacy is a wide concept and cannot be covered in one questionnaire it is therefore good for other studies to be formulated covering other financial literacy concepts and also its effects on specific behavioral biases which weren't covered by this study to be able to generalize the results and say they define clearly the individual investors at the NSE.

The study recommend that in future, researchers should also look into other concepts of financial literacy other than focusing on knowledge on financial markets operation and computational skills and include them in measuring scale as an attempt to fully study all aspect of financial literacy in one measure and apply this complete measuring scale in

establishing how financial literacy and behavioral biases relate. furthermore, the researcher recommend that future studies to use an harmonized measure which will ensure that when comparing studies by different researcher, across countries, and done during different time and the same measure which can be applied with reliability is what has been used.

The study covered only Nairobi county where most of the individual investors at the NSE are based, in this regard the researcher suggest that a further study need to be done covering other areas in the country and if possible the entire population of individual investors in Kenya which will help give better understanding of how financial literacy affect behavioral biases of an individual at the NSE and apply it for policy making.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Please provide information on the following questions provided in this questionnaire and note that this information will only be used for academic purposes and the researcher will treat all the responses with utmost confidentiality.

PART A: BIO DATA

Instruction: tick in the spaces provided.

Variable	**Investor's Grouping**	Tic**k (√) Appropriately**
Age	18-25 years	
	26-35 years	
	36-45 years	
	46-55 years	
	Above 55 years	
2.Gender	Male	
	Female	
3.Marital Status	Married	
	Single	
4.Educational Background	Primary	
	Secondary	
	Collage	
	Graduate	
	Post Graduate	
5.Investment experience	More experienced	
	Moderate	
	No experience at all	

PART B: FINANCIAL LITERACY

The following statements represent financial literacy related questions. Please indicate your level of agreement to each of the following items as related to financial literacy using the scale of 1 – 5 where 1=Strongly disagree; 2= Disagree; 3=Neutral; 4= Agree and 5= Strongly agree	**To what extent?**				
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
	1	2	3	4	5
1. Before buying something I carefully consider whether it is affordable					
2. I don't care about tomorrow I leave only today and let the tomorrow sort itself					
3. I like spending money than saving it					
4. I always pay my bills on time					
5. I can risk some of my money in saving or making an investment					
6.I keep a close watch on my financial affairs					
7.I set myself long term financial goals and strive to achieve them					
8.Money is there to be spent					
9.If you buy stocks from firm B you own part of that firm					

10. If you buy bonds of firms B, you are liable for firm B's debts					
11.Considering a long period example 10 to 20 years bonds give higher returns than stocks					
12.When an investor spreads his money among different assets, the risk of losing it is high					
13.Normally, bonds displays the highest fluctuations over time as compared to savings accounts and stocks					
14.When interest rates falls bonds price falls					
15.Sh.1 Million last year is of different value from Sh.1million of today					
16.Mutua funds can invest in several assets , for example invest in both stocks and bonds					
17.Buying a company stock usually provides a safer returns that a stock mutual fund					
18.Insurance companies offer retirement products					
19.Stocks provide stable and predictable returns					
20.A stock market results in an increase in prices of stocks					

PART C: BEHAVIORAL BIASES

The following statements represent behavioral questions. Please indicate your level of agreement to each of the following items as related to financial literacy using the scale of 1 – 5 where 1=Strongly disagree; 2= Disagree; 3=Neutral; 4= Agree and 5= Strongly agree	**To what extent?**				
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
	1	2	3	4	5
1.Overconfidence Bias					
i). I am an experienced investor					
ii). I feel more confident in my own investment opinions over opinions of my colleagues or friends					
iv). I use my predictive skills to time the market and to make my portfolio performance higher than the market performance					
v). I believe that my skills and knowledge of stock market can help me to outperform the market.					
vi). I trade stocks excessively					
vii). I have the ability to choose the stocks which its performance will be better than the market performance					

2.Herding Effect Bias					
i). Other investors' decisions of choosing stock types have impact on my investment decisions.					
ii). Other investors' decisions of the stock volume have impact on my investment decisions.					
iii). I usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market.					
iv). Other investors' decisions of buying and selling stocks have impact on my investment decisions.					
v). I feel my friends/family have more knowledge about investing than I do					

Thank you for participating

APPENDIX II: LIST OF STOCK BROKERAGE FIRMS IN KENYA

1. ABC Capital Limited
2. African Alliance Kenya Securities Bank
3. Apex Africa Capital Limited
4. AIB Capital Limited
5. Barclays Financial Services Limited
6. Dyer & Blair Investment Bank Limited
7. Equity Investment Bank Limited
8. EFG Hermes Kenya Limited
9. Faida Investment Bank Limited
10. Francis Drummond & Company Limited
11. Genghis Capital Limited
12. Kestrel Capital (EA) Limited
13. Kingdom Securities Limited
14. NIC Securities Limited
15. Old Mutual Securities Limited
16. Renaissance Capital (Kenya) Limited
17. SBG Securities Limited
18. Securities Africa Kenya Limited
19. Standard Investment Bank Limited
20. Sterling Capital Limited
21. Suntra Investment Bank Limited
22. CBA Capital Limited
23. KCB Capital
24. Ngenye Kariuki & Co (Under Statutory management)