Impact of Behavioral Finance on Investment decisions – An Investigation in to how psychological factors affect Investment decisions among millennial Investors in Nigeria.

Atinuke Bogunjoko
Masters of Finance
National College of Ireland

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Abstract

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Standard Finance since the 1980's has had to contend with behavioral finance due to the absence of "reality" in the assumptions made about the financial market. The primary objective of this research is to investigate the impact of Behavioral Finance on millennial Investment decisions in Nigeria while the secondary objective is to know how correlated the behavioral factors is with the sociodemographic characteristics, focus is shifted to a particular generation who are called 'The Millennials'.

The research onion was used to serve as a guide to carry out appropriate strategies to solve the research problem. The researcher used the quantitative methods to answer the research problems. A survey was carried out using existing studies in the field of behavioral finance. The survey was distributed mainly to millennials investors as they are the purpose of this research via the WhatsApp platform to various social groups, the number of participants that were able to fill the survey was a 102. The use of Statistical Package for Social Sciences (SPSS) software was used to analyse the data collected using both the Descriptive and Inferential Statistics.

The study showed that Market impact such as overreaction to price changes and past trend of stocks had the highest impact on millennial investors while Heuristics, Framing (Prospect theory), Emotions, and Herding have moderate and low impacts on millennial investors. Another key finding was that less experience millennial investors (retail) are more likely to be influenced by the behavioral factors while the behavioral factors tend to have less impact on older investors (Institutional). this research paper, proves that behavioral factors have a significant impact on millennial investors decisions, it was also observed that overconfidence (a factor under heuristic) is an underlying factor that heightens the presence of other behavioral factors in millennial investors.

The study fills the intended gap by comparing and contrasting different behavioral factors that possibly impacts millennial investment decision in a developing country such as Nigeria. This research contributes to existing knowledge and bring insights to investors on psychological biases that could affect investment decision. It is also worthy to note that there are other factors which could also contribute to how investors make their decisions.

Keywords: Standard Finance, Behavioral Finance, Market Efficiency, Millennials, Investment decision making, Rational.

Submission of Thesis and Dissertation

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Chapter 1: Introduction

There have been various opinions on the standard and behavioral finance school of thought. (Baker and Nofsinger, 2010) explains that standard finance assumes that Investors are rational in their dealings and have adequate knowledge about the market at every point in time and season to make realistic Investment decisions (i.e., increasing their gains and having reducing risks to the most acceptable level). It is also assumed that all Investors is solely responsible for their actions in the financial markets and the consequences of their decisions would affect only the Investors (positively or negatively) and not the market. The market is found to be efficient. However, Riaz and Iqbal (2015) explains that Behavioral finance dismisses the traditional school of thought as the standard assumptions about the market and investors are greatly flawed and not realistic. Humans are not perfect and tend to easily make mistakes which can be mostly caused by certain behavioral or psychological biases. Simply put, Behavioral finance considers real life situations and how flawed the human condition can be when making important decisions especially when investing. Behavioral finance can be categorized in to four main themes which are Heuristics, Framing, emotions and market impact (Baker and Nofsinger, 2010).

This initial gap was identified by the first proponents of behavioral finance Debondt and Thaler (1985) who did a research on how the stock market overreact and findings showed evidence that investors overreact to information who deviate from the norm and also ignore predictive trends on the long run, other researchers such as Tversky and Kahneman (1974), Barber & Odean (2002) to mention a few also validated this findings by considering other behavioral biases which affects the investors in their decision making.

Tversky and Kahneman (1974) who were among the first proponents of the prospect theory explained that an investor being irrational was based on sentiments and their incapability to be able to fully grasp the information they have due to some perceptive difficulties as they hold on to a belief even when facts/truths are clearly evident. In another research, Kahneman and Tversky (1974) explained that framing also played an active part on how people viewed investment opportunities as they tend to focus on only one angle without considering other potential hitches when making decisions.

One specific bias that would be discussed is Overconfidence under heuristics. Jha (2016) defined Overconfidence as the will to boast or make prowess on one's self in making sound decisions towards investment. Barber & Odean (2002) clarified that such behavior only made things worse for the investors as it had a negative reaction on their returns on investment

Since Behavioral finance came to limelight several gaps have relatively been addressed. Due to observation and further findings, this paper intends to address the behavioral biases in a developing country - Nigeria whose environs are unpredictable and susceptible to threats, economy and political instability and have little or no education on what influences their investment decisions, focus is shifted to a particular generation, "The Millennials". Riaz and Iqbal (2015) who also researched on a developing country – Pakistan explained that these factors tend to influence the thinking patterns of investors. In the survey of Lusardi and Oggero (2017) carried out on "**Millennials and Financial Literacy: an economy-by-economy breakdown**" it found out that Millennials investors from Nigeria (Aged 15 – 34) were only about 24% financially literate talk less of being aware of what are the other factors that affect their decisions.

1.1 Who are the Millennials?

Raines (2002) defined Millennials as people who are born in the 1980's and 2000's who are the children of the baby boomers (Generation X). they are often called the "digital natives". Wesner and Miller (2008) had beliefs that the millennials spent their whole lives in the technology age and did not have to transition from one way of life to another which has affected their way of life. Kurz, Li, and Vine (2019) explained that the millennials are seen as the basis for an economy growth and also dictate the media and industry metrics. Baihaqqy (2020) explained that every generation has peculiar characteristics as a result of what was confronted during their lives; the researcher further said that every generation had a link with investment behaviors in investment decision making.

According to Statista (2021) published by Simona Varrella, Nigeria is ranked 18th in the whole world and 1st in Africa as their population is filled with more of youngsters than the aged. The youngsters (0 to 20 years) represent 53.9% while the millennials (23 – 40 years) represent 25.2% of its entire population. Lusardi and Oggero (2017) referred them as "instant gratification generation" (not usually wanting to put in the work) as they are usually overconfident, optimistic and clouded by unrealistic beliefs about their decision made in both career and private lives which likely ends up in tears while other generation tend to have reward for their decisions made (Twenge, Campbell, Hoffman & Lance 2010). According to Schawbel (2012) by 2025 millennials would populate the labour market i.e., for every four workers, three would be millennials and their behavior towards decision making would greatly influence the economy that other prior generations. As previously mentioned, the millennials are called digital natives, with the aid of just a smartphone or a technological aid the access to information is unlimited, they tend to multi task and have a wide range of options when making decisions while this in itself has its advantages, there has been an opposite reaction to this as critics explains that this way of life might be too stressful and hectic which at the long run could cause an emotional breakdown or anxiety and also lays waste to orthodox skills such as writing and reading (Alsop, 2008). According to Carr and Ly (2009) with the use of social media to access information which is in fact an addiction has reared some unknown phenomena such as the "**Fear of Missing Out"** which is known as **FOMO** – this phenomenon is due to the presence of so many alternatives to choose from with little or less involvement in it. Sashittal, Hodis and Sriramachandramurthy (2015) explains that this causes millennials to make hasty decisions without consideration for other important factors.

For this reason, this research intends to investigate the behavioral factors responsible for how investment decisions are made and it is important to note that the factors being examined are not limited to themes mentioned in this research as there are other factors that has been examined by other researchers in various regions of the world. The four themes that would be examined are Heuristics, Framing, emotions and market impact. The researcher also intends to look at the behavioral factor called Herding as this factor in other empirical studies as showed great influence towards investors decision. It is also important to state that as much as the demographic factors would be taken in to consideration such as the educational background, social status, nationality to mention a few, the results that would be gotten might or would be totally different from other countries.

This study would be organized in to seven chapters:

The second chapter covers the Literature Review. In this chapter, the researcher introduces some concepts of standard finance and goes further to highlights the themes and members of the behavioral factors that affects investment decision making and also gives an overview of existing studies of behavioral finance.

The third chapter covers the Research Problem. This chapter explains the aims and objectives of this thesis. This segment is directly linked with the literature review which appropriately sets out the objectives.

The fourth chapter covers the Research Methodology. This gives a detailed description on how the research problem would be addressed. The research onion developed by Saunders, Lewis and Thornill (2015) would be used as it gives and identifies approach suitable for the quantitative research. The research approach, philosophy, strategies, data collection would be explained in greater length in the chapter.

The fifth chapter covers the Results of the statistical analysis based on the research methodology chapter. In this chapter, the use of descriptive analysis helps to give a simple representation of the data collected while inferential statistics would be used to test the hypothesis between the dependent and dependent variables outlined in the third chapter with the aid of non-parametric tests such as spearman rank correlation and Exploratory Factor Analysis (EFA)

The sixth chapter covers the findings of the results amidst previous findings in behavioral finance and also aims to look at the limitations spotted by the researcher and suggestions for future research in this field of finance.

The seventh and final chapter gives conclusions and summary to the findings of this study.

Chapter 2: Literature Review

The Literature review would be mainly focused on behavioral finance and it factors but it is important to also understand what birth behavioral finance which is the "Standard Finance". Its assumptions are based on an investor being a rational being, the market is efficient and perfect and complete information are available to all investors. Some of the building blocks for this assumption is the Efficient Market Hypothesis (EMH) and Modern Portfolio Theory (MPT) which was founded by Eugene Fama and Harry Markowitz respectively. These sections discussed would briefly highlight the theories of traditional finance and limitations.

2.1. Modern Portfolio Theory and Efficient Market

Wamae (2013) explains that portfolio management theory (Harry Markowitz (1952)) is based on the market and not the individuals who tries to have optimal portfolio. The goal is to identify the suitable level of risk gotten from variance and correlation of the portfolio which would give the maximum expected return.

Birau (2012) explained that the whole essence of Efficient market hypothesis by (Fama 1970) the stock prices must mirror the available information be it in any of the forms (i.e., Weak form, semi strong form or strong form) and therefore made available to the investors. These two papers were held in high regards until certain processes were put to test which flunked the so-called assumptions, hence, the birth of Behavioral Finance. The three forms of market efficiency proposed by Fama;

- Weak form efficiency: this is when the current stock prices mirror the historical information of the share prices. This form makes it impossible to make abnormal or excessive gains and could be used to predict future trading.
- Semi-strong form efficiency: this is when the present stock prices mirror publicly accessible information. This publicly accessible information contains both past and present information to guard against excessive profit.
- Strong form efficiency: this is when the present stock prices mirrors both private and publicly accessible information. The private information gives investors special knowledge about the stock prices but does not allow for consistent excessive gains on the stocks.

According to Shiller (2003) many financial models took origin from the Efficient Market Hypothesis Theory such as Intertemporal Capital Asset Pricing Model by Roberts Merton (1973) this was to help investors to curb risks by identifying portfolios in the market to hedge against the risk, Asset prices in an exchange economy by Robert lucas (1978) which helps to forecast elements between the rational asset prices and consumption.

Anu (2019) explained that the portfolio theory might set the pace for optimal portfolio diversification but the assumptions behind this theory are unrealistic because investors decision making are based on preferences, experiences and beliefs. According to Shleifer & Summers (1990) the first step to optimal portfolio is an "Investment Strategy" using either the fundamental analysis which means using important factors such as the financial statements or industry attributes that affect the stock price or the technical analysis which involves the trends in past stocks, the use of information on stock prices (mainly historical) or just by personal Intuition, however, Shefrin & Statsman (2000) argued that investors whose preferences are based on this have tendency to choose very risky portfolios as they are eager to accommodate more risks which violates the assumption of the investor being risk averse. This was supported by Arvid Hoffmann, Hersh & Joost (2010) who conducted a survey on a sample of investors on their investment strategies and objectives, this study found out that investors who use fundamental analysis tend to be risk

seekers and overconfident than investors who choose technical analysis. While it seems that some researchers are for and against this theories Curtis (2004) seems to have a different opinion as the theories under traditional finance is as well needed as the factors under behavioral finance. The combination of rational and irrational approach towards investment strategy may just be the trick needed to solve most Investment decisions.

The purpose of this research is to address Behavioral Finance in a greater detail. For further study on the Modern Portfolio Theory and Efficient Market Hypothesis, the researcher recommends Fama Eugene and Harry Markowitz studies on the aforementioned alongside related studies such as the "Modern Portfolio Theory and Behavioral Finance" by Gregory Curtis.

2.2 Behavioral Finance

Statman (1995) explains that standard finance is an area of study built under the assumptions of Modigliani and Miller, portfolio theory of Harry Markowitz, efficient market hypothesis of Fama to mention a few, he further said that the study of behavioral finance emerged from these limitations of the standard finance. The question has always been if the market were efficient, why are there bubbles in the financial markets. Konstantinidis, Katarachia, Borovas and Voutsa (2012) explained that the first uproar and questions about the Efficient Market Hypothesis was the dotcom bubble also known as the "Information Technology Bubble" which consists of companies who used the internet for its growth and gained popularity by just adding the ".com" to their companies name in the 1990's, this obviously would catch the eyes of any investor and the stock of this internet related companies increased by 400%, this even led to investors quitting their jobs to trade full time in the market. In the early 2000's, capital used to fund the tech companies began to dry up as the internet related companies were not able to make profit as expected, that was the beginning of the burst which had severe outcome for Investors. To support this, Landberg (2003) explained that there are two traits that control an investors decision which is "fear and greed", in other words what motivates an investor is self-interest (to make money) and fear of making a loss. Shefrin (2002) explains that psychology encompasses all human motivation and also forms the root for common mistakes they display in reality. Fromlet (2001) explains that behavioral finance uses both psychology and finance to explains the rationale behind an investor behavior towards investment decision and also explains the market anomalies. There's a dismissal of the normative approach on how the investor ought to behave. Hooker (2017) explained that the millennial investor tends to trust his instincts and the trends of the market with little or no information about the market. Hence the introduction and explanations of the biases. Tarjanne (2020) explains that an investor wants to derive three interests from his investment which are utilitarian, expressive and emotional. Utilitarian interest which means he wants a gain from his investment, Expressive Interest which means his investments must hold some sort of value and status to other investors while emotional interest involves what feeling does the investor investments expose him to. There have been several researcher and psychologist who have contributed severely to understand the investor behavior and they are still significant and relevant across several case studies which also includes this researcher's study. This section would discuss the four themes under behavioral finance; Heuristics, Framing, emotions and market impact including the Herding bias. The themes stated above can be broken down in to sub factors which would help clearly understand the psychology of the investors mind.

Table 1. Themes Of Investors behavior

Themes	Behavioral Factors
Heuristics	Overconfidence Representativeness Gamblers Fallacy
Prospect Theory	Framing Loss aversion Mental Accounting
Emotions	Regret Aversion Optimism Bias Illusion of control
Market Impact	Overreaction to price changes Past trend of stocks
Herding	Herding

Source: Waweru et al (2008), Kahneman (2011) and Baker and Nofsinger (2010).

It is important to know that this table might be slightly different from other researches due to the factors that are examining and the sources gotten from.

2.2.1 Heuristics

Heuristics are simple alternatives and time saving methods that are used to easily make decisions especially when the expectations of the investor are blurry or without foresight (Baker and Nofsinger, 2010). Waweru, Munyoki and Uliana (2008) explained that heuristics are actually applicable in a sense but when not used appropriately could cause poor judgement in decision making. Kahneman (2011) argues that heuristics shifts people from reality to a place of oblivion where they are forgetful and there's nonexistent phenomena basically not tackling the root problem but by trials and error by which they come up with a "rule of thumb". Such processes could lead to erroneous decision making. There are three biases that will be discussed under this theme which are Overconfidence, Representativeness and Gamblers Fallacy. Loh (2016) explains that through the research work of Tversky and Kahneman (1974) these factors (not limited to this) were identified.

Overconfidence

The term confidence is when a person is sure of their ability and these traits portrayed brings about a form of assurance to their personality. It is also believed that it's a determining factor for success. Cheng (2007) explains that Overconfidence is one of the popular biases displayed by an investor when profiling his investments, they tend to display excessive self-assurance in their ability. Plous (1993) often regarded this bias as the most treacherous bias in the behavioral finance. Corzo, Prat and Vaquero (2014) explains that overconfidence does not "hold water" in what the investor does as they will buy and sell stocks without proper conviction and reason, they see this behavior as a combination of overconfidence and herding as he continues to invest in the same investment due to it past wins and does not take in to consideration the changes that needs to be made for future decision making. Therefore, he depends on his ability and instinct in others to operate. Herding would be fully discussed during the course of this chapter.

"***If fortune is on your side, be grateful, and do not ruin things with unjustified pride."***

Paragraph 95 – Joseph de la Vega (1668)

Shefrin (2000), Shiller (2000) and Thaler (2005) agrees that while trading should be limited, overconfidence leads to excessive trading. This bias tends to bring overreaction and under reaction to information making investors to under or overweight its assets (Kent, Hirschleifer and Subrahmanyan (1998)). Keil, Depledge, and Rai (2007) also argued that overconfidence can also develop the illusion of control bias that give the illusion over conversant features which could lead them to think they have control over their circumstances and what they are capable of doing. The illusion of control is another bias that would be discussed in detail in this chapter. Budiarto (2017) explained that overconfidence is trust in one's intuitive ability too much. Adielyani and Mawardi (2020) explained that over confidence along with the above studies have a positive impact on investment decisions because it considers the investment portfolio and beliefs which enables the investor to make the right decision but (Rahman and Gan, 2020) argues that this bias has a negative influence on investment decisions because it leads to returns diminishing underrating the mistakes that can occur when choosing an investment and the tendency to have an under diversified portfolio.

Representativeness

A good representativeness is how well the study of a sample can be accurately be inferred on its entire population (Jha, 2016). This was originally proposed by Amos Tversky and Daniel Kahneman in the 1900s. Jha (2016) further explained that the representativeness bias allows people to strongly emphasize or take more in to consideration recent information for decision making rather than prior information. Kirs, Pflughoeft & Kroeck (2001) also argued that investors who use this bias have the tendency to capitalize on a particular factor and ignoring every other piece of information that could aid better decision making. Islam (2012) explain that this bias mainly affects investors who make equity investments. Lakonishok, Josef, Andrei, and Robert (1992) who conducted a research on 769 investors who held an all-equity pension fund in their portfolio between 1985 to 1989 concluded that there was evidence that investors relied more on positive feedback on smaller stocks (from growing companies) rather than large stocks (from established and stable companies). In contrast to Lakonishok et al (1992) findings, Lauricella (2019) also examined a wide range of small and large stocks from 1999 to 2019 and concluded and argued that investors would rather invest in large stocks from mature companies rather than in small stocks and that the chances of a smaller stock outperforming a large stock is rare. These two studies above do not give a definitive head way for which stocks investors should invest in, thus a vivid example of representativeness. This bias could deter an investor from making wise decisions. Kahneman and Tversky (1974) explains that some biases like base rate, sample size neglect and conjunction stem directly from the representativeness bias. Base rate bias makes the investors make decisions based on irrelevant information, sample base rate is a bias that investors fail to properly examine the sample size to be used as the processes involved in generating the sample is not known, investors would tend to make decision or infer it as a general view from not so many strong facts while conjunction fallacy is a bias that refers to the disruption of the probability principles as a result of the representativeness bias. By neglecting these biases mentioned the representativeness bias is heightened.

Gamblers Fallacy

Gambler's fallacy is a bias that gives the conviction that the occurrence of an event (K) is independent by any other related event but it is likely to be affected by a totally different occurred event (L) but in actual sense event K has nothing to do with the occurrence of event (L) (Rakesh, 2013). he also explained that the Gamblers Fallacy was also known as the Monte – Carlo Fallacy or Maturity of Chances Fallacy. Jha (2016) explained this theory with an example of an Investor who made a capital gain from his portfolio and dabbles in to a high-risk investment with the illusion that he'd probably make more gains where as there are greater

chances of the investor making great losses from the investment. A lot of researchers past and recent have gone ahead to conduct experiments concerning gamblers fallacy. Jim Loy (1996) conducted an extensive research to better understand the concept of gamblers fallacy by giving a scenario to a group of people that a coin was tossed seven times which showed head and asked what's the probability of a head showing? The researcher confirmed that the 2 groups of people that answered the question had a gamblers fallacy bias as one group thought that since heads was tossed seven times the 8th toss would also be the head while the second group also considered that a tail would show after the 8th toss but the researcher said that the correct answer was meant to be that the likelihood that a head or tail would show remains the same and the occurrence of a head or tail showing are independent of each other. Masomi and Ghayekhloo (2010) also conducted a research on a group of investors in Tehran if they could accurately predict the outcome of a stock market, 78.5 % of the Investors were assertive of their ability to deduce the outcome of the stock market with their knowledge and understanding of the stock market, Gambler's fallacy was detected amongst the investors. Tversky and Kahneman (1972) explained that investors fall prey to gamblers fallacy due to representativeness which was earlier described above. Rakesh (2013) explains that the gamblers fallacy come in one form or the another and has an adverse effect on investors decision making or the outcomes. Based on the above empirical studies, this researcher thinks that overconfidence and illusion control are also determining factors for gamble's fallacy bias to be present

Three biases under heuristics have been discussed especially its importance on Investment decisions. It is safe to say that one bias could lead to so many other biases as seen in the above. It is important to state there are more than just three heuristic biases but for the purpose of this research it has been limited to three biases. Extensive research has also been done by other researchers in one way or the other either by extensively diving in to a particular bias or researching on a lot on heuristics biases backed up with experiments. For any further enquiry you could look at the researches of other researcher mentioned above.

2.2.2 Prospect Theory

Kengatharan and Kengatharan (2014) explains that the Expected Utility Theory and the Prospect theory are two styles to make decisions under uncertainty. The former is however different from the latter because it mainly comprises of logical and normative expectations when making decisions under risky circumstances, this theory could not understand while people were attracted to insurance at the same time attracted to gambling while the prospect theory tries to accommodate the investors school of thought or mental belief. Ritter (2003) explained the prospect theory is a theory of individuals making their choices under uncertainty. He further said that this theory mainly focuses on increase in wealth i.e., concerns about gains and losses rather than the levels of wealth (the expected utility theory). Mbaluka, Muthama and Kalunda (2012) explained that the prospect theory has contributed greatly in to the understanding of how investors behave in terms of making choices when it comes to wealth creation. Ritter (2003) also stated that that loss aversion and framing are two important biases commonly used by investors to make decision, for fear of loss gives a sense deep of sorrow rather the satisfying nature of making a gain also stated by Kahneman and Tversky (1979). Both biases would be explained below.

Framing

Kahneman (2011) explains that it is awfully rare to see people that are "**reality bound**". Framing is also another bias that leads to erroneous decision making. According to Fromlet (2001) Framing is one theme that dominates Behavioral finance, he explains that framing is made of short and conventional gags which acts as fillers for investor to respond to certain events in the market. Diacon and Hasseldine (2007) also

tested the bases on investors who rather frame their information in pictorial appearances rather than information based on the way it is. A test was carried out on individuals where past information was presented visually (Images) and this showed a great influence on their decisions. Wahla, Akhtar and Shah (2019) also studied the relation between the framing effect and the financial wellbeing and investment behavior of investors and results from his study showed that there is a negative correlation between framing and the financial well and behavior being as he cited researchers such as Kahneman and Tversky (1984) that this bias could have the investors making decisions that can adversely affect the wellbeing of the investor. Wahla *et al* (2019) explained that the reason why investors are frame dependent is because of their inability to fully comprehend additional information given, hence, the reliance on behavioral biases such as framing, that's why Ritter (2003) also said that investors would easily comprehend information that are brought to them in a positive manner rather than information portrayed in a negative manner or neutral manner. Gonzalez, Dana, Koshino and Just (2005) also supported these two researchers by explaining that investors can only expose their selves to a certain level of risk (risk acceptance) by how information is relayed to them which would inform their choices.

Loss aversion

According to Tversky and Kahneman (1979) in the sphere of money, people put twice as much worth on a loss rather than the same value of gain i.e., Investors are risk averse to gains and risk takers in losses. Mbakuala (2012) explains that loss averse investors incorporate the framing effects in their reaction to gains or losses made. Other researchers like Berkelaar, Kouwenberg and Post (2004), Gomes (2005), and Polkovnichenko (2005) explained that as a result of loss averse investors reacting to a loss made, they will not engage in equity stocks or apportion a significant amount of wealth to their investment portfolio. Barberis and Thaler (2003) argues that investors who monitor their investments on a daily basis are those who are loss averse and in that view be able to distribute more or less wealth to their investment. They term this particular type of investors as "myopic loss averse investors". Kasemsap (2015) says that the thought of having a loss is so unbearable that investors would do anything to breakeven. Khoshnood and Khoshnood (2011) investigated the capital market investors of Iran they found out that because of this bias inexperienced investor forget what the stock market lives by – "Buy when the prices are low and vice versa" but they are too caught in avoiding a loss. Sevil, Sen and Yalama (2007) also conducted a study on the investors of Istanbul with a choice of selling a stock that would profit or selling a stock that would yield a loss, 74% of the investors sampled want to sell their stocks that would yield profit.

Mental Accounting

Khoshnood and Khoshnood (2011) who cited Daniel Kahneman explained mental accounting is a state where people segregate funds in to different accounts with the intention of using it for different purposes which has a damaging consequence on their decisions especially their consumption and investment decisions. Ritter (2003) also supported this researcher by stating that people don't know when to combine and separate decision in reality, he further explained by giving an example about a household who would rather separate funds or budget for food and entertainment. In the funds separated for food they'd rather want to save more by buying less expensive food to eat at home but when in the restaurant they would not mind buying expensive food. Ritter (2003) explains that decisions like this should in principle not be separated. Shefrin and Thaler (1988) concludes that people separate and allocate their funds in to three main 'metal accounts' which are (i) Current income (ii) Current wealth (iii) Future income. He further explained that the highest inclination to consume dwells more from the current income and the smallest hales from the future income account and as such the consequences leads to separation of risks which is termed narrow framing. Meheran (2009) in their study could not tell the difference between a good stock and a good

company. People would only tell base on well-structured advertisement and their presence in the economy. It was also said that one of the setbacks is the lack of experience and knowledge of individuals.

2.2.3 Emotions

Fromlet explains that the human emotion is quite hard to comprehend as it's a mixture of self-conceit, fear, greed, regret, satisfaction which certainly exposes itself in investment decisions. Baker and Nofsinger (2010) explains that the market can be very intrusive and volatile and emotions can certainly spring out of place and make decisions not properly gone through the right channel or plans made. they also emphasized that emotions play a major part in the lives of human behavior, thinking process and growth. (Ahmad, 2019) explained that valuation of temperament and management of feelings can foster healthy Investment decisions. Riaz and Iqbal (2015) explained that optimism and self-control bias has brought more damage than good in terms of investment decisions. Funds spent on expenses (present gratification) rather than savings can lead to early retirements and little savings, also having trivial sentiments on investments such as being too optimistic hasn't done any good. Three biases under emotions the researcher would be looking at is Optimum Bias, Illusion of Control and Regret Aversion.

Optimism Bias

Lovallo and Kahneman (2003) defined optimism as the inclination of an investor to accept an inner view rather than accepting an outward view which is more in line with real world situations. The inner view is defined as the investor state of mind and the standards he/she places for what is acceptable or not. This in it sense displays optimism bias as decision would be based on feelings which is one sided and not reflecting rationality. Investors are being stimulated to face reality and take in to consideration outcome that would benefit the investor. Riaz and Iqbal (2015) explains Optimism bias as a bias that is peaked by an interest in something i.e., is when principles are in harmony with your interests. Shefrin (2007) explains that an overappraisal of a desired result when compared with a hostile result is usually linked to optimism. Iqbal (2015) also stressed the importance of optimism bias in investment decision making as it encompasses both micro and macroeconomic activities especially in high-risk decisions. He also included that the volatility of prices has a great link with the optimism bias. Yari (1987) who did a research on dual theory of choice under risk explains that optimism and pessimism Is in relation to probability. Probabilities either small or big brings about different attitudes displayed by individuals. Martin (2008) conducted a research on optimistic managers and their impact on a firm's performance and decision making defined an optimistic manager by supporting Shefrin definition of optimism. His results found out that there is a negative effect in optimistic managers forecasting that companies who continually generate earnings to the business as they tend to perform poorly in the future but tend to take different approaches in their decision for instance reducing cash and increasing debts. Wang, Sheng and yang (2013) argues that optimism bias bridges the gap between an investor and its manager, as the manager would invest in risky assets aligning his or her decision with that of its investor receiving a cheaper compensation for its investment strategy.

Illusion of Control

Shefrin (2007) defined illusion of control as the inclination of individuals to think that an event or outcome can be controlled by them whilst in truth, they have no influence or control over it. Qadri and Shabbir (2014) explained that a side effect of this bias is that it leads to overtrading which increases costs. Langer (1975) explained that the illusion of control is termed as 'inappropriate personal success' that is visibly higher than the expected outcome, which means this is a defined success within the boundaries of human comprehension. The likes of Qadri and Shabbir (2014), Tyszka (2004) linked the illusion of control bias

with over confidence. Chudzian, Podlińska and Ładno (2018) explains that there are five factors that influences the illusion of control bias which are choice, the sequence of results, knowledge of the problem, information and commitment and this factor exaggerates this control bias to a great extent. They simply explained that an investor can greatly be influenced by this bias when these factors come in to effect through a means that is familiar be it random or intentional it gives the investor an illusion of control that he is controlling the outcome whilst they are not. They also carried out a research and found out that illusion of control and financial decision are strongly correlated

Regret Aversion

Pompian (2011) explains regret aversion as a psychological phenomenon that is mostly reflected on investors. It is the ability of the investors to not indulge in any decision-making activity in other to avoid making any decision that would yield any kind of regrets in the future. He further explained that the bias should not only be associated with loss but also the responses of investors to a potential gain in a business. Investors who have experienced regrets tend to withdraw, be very conservative and try to heal before indulging in anything investing. Gazel (2015) explains that there are two assumptions that underlies this bias which is (i) there are two main sensations investors get off from; regret and rejoicing (ii) decisions made put in to considerations the sensations earlier mentioned. Talha (2015) explained that the main effects of this bias is that the investors tend to sell their winners quickly and hold on to their losses for an extended period of time resulting to reduced returns. Pompian (2011) further explains that investors who tend to avoid regret make sure two mistakes are not acted up on which is the ***error of omission*** and ***error of commission***. Error of omission means mistake done unknowingly while error of commission are mistakes done out of negligence. In essence, this bias is also responsible for mistakes made in Investment decisions. Baker and Nofsinger (2010) explains that this bias falls under the category of emotion as it's an expression of regret, disappointment, unhappiness etc. Loomes and Sugden (1982) came up with a model called the "Modified Utility Function" the assumptions under this function states that an individuals rejoice and regret is based on a choice less his utility and the awareness of what might have occurred or have occurred, they reckoned that if the end result of what might have occurred or occurred can give maximum satisfaction or grief then there would be no regret at all. This model is considered to be applied to a real-life scenario. Michenaud and Solnik (2008) used this model to hedge currencies to get ideal solution to choices made.

2.2.4 Market Impact

Barberis and Shleifer (2003) explained that the overreaction and underreaction of an investor is due to their styles of investing based on past events, seasons which ended in the price bubble and the herding behavior of investors as a result of same styles of investing used or prevailing in the market which causes fluctuations in the asset prices. Baker and Nofsinger (2010) noted that the investors who are arbitrageurs continually make the market well-organized but could also be responsible for the market anomalies. Waweru, Munyoki and Uliana (2008) in their study mentioned six market factors that would stimulate decision making in Investments which are Past trend of stock, over reaction to price changes, fundamentals to underlying stock, customer preference, market information, price changes. Only two out of six would be explained for this research. For further enquiry please refer to Waweru *et al* (2008).

Over reaction to price changes

Nader and Zahra (2018) consider overreaction and underreaction as expected glitches in a financial market as this is as a result of new information and it is usually associated with price return. Overreaction occurs

when the changes in the prices of stock is more exaggerated that than the information given. This of course counters the Efficient Market Hypothesis which states that all stock prices mirror the available information at the time be it in its strong, weak or moderate form. Daniel and Titman (2006) explained that stock prices react more to immaterial information such as rumors, no evidence-based information than tangible information such as important and relevant information.

Past trend of stocks

Andreassen, Paul and Stephen (1988) explain that when investors are shown historical prices and are expected to trade in a stock market, they tend to generalize this trend on a periodic basis. Kahneman and Tversky (1974) also explained that investors like to categorize price patterns to its specific trends leading to feedbacks.

2.2.5 Herding

Kengatharan and Kengatharan (2014) defined herding as the inclination of investors to follow the actions of other investors in the market. They further explained that experts are mostly worried about investors who lean on collective information rather private and investigated information. Some investors may prefer herding only if this bias is capable of extracting out valuable and dependable information and could also be used to evaluate performance of some financial institutions alongside their peers as low-level companies might want to imitate high growth companies. Shiller (2000) explains herding as investors who individually make decisions logically but when done collectively it's becomes illogical. Herding is quite common in the financial market as there is evidence in the dot com bubble and the crash of the stock market in 1987 – (Shiller (1990) & (2005)). Devenow and Welch (1996) in their study write that perhaps imitating and mirroring the actions of people is simply one of human elementary nature and this behavior particularly arises from stream of information that arises alongside the observance of past decisions of other investors to make rational decisions while ignoring their personal information gathered. Corzo, Prat and Vaquero (2014) cited Joseph de la Vega's Confusion de Confushiones gave a contrary opinion that herding helps investors from making wrong and common mistakes when investing their funds although this was written in 1688 and in consistence with what was happening at the time, Devenow and Welch (1996) researcher came out to counter Joseph de la Vega by writing that it rather leads to investors making erroneous mistakes like when the stocks are not reflecting the right information it helps the investors to look out for 'portholes' and critically evaluating their decisions. Both viewpoints of the researchers help us to realize that herding is stemmed out from non-reality prospects.

Hey and Morone (2004) tested this behavior by using the market as a "disciplining tool" which should help to curb the herding behavior through market forces that encourages the retainance of private information. It found out that the reason that this behavior manifests was due to false information and also in relation to stock market crashes and bubbles as mentioned previously. They also noted that herding could also arise when there's a perfectly well-defined market and that the market could also be misled by investors who also have private information. The likes of Drehmann, Oechssler, & Roider (2005), Cipriani and Guarino (2005) and Avery and Zemsky (1998) conducted an experiment on the investors who had access to private information on the assets and also historical trends to trade serially, it was found out that the herding behavior was absent, private information was used minimally rather they display opposing behavior by trading against the market. Duxbury (2015) explains that some of the experiments conducted are criticized as they are gotten from inexperienced participants like students. Alevy, Haigh and List (2007) conducted an experiment between professionals and inexperienced students and found out that the herding behavior

could be detected with the distinction of these two parties. It was stated that professionals depended on their information gathered privately while the inexperienced students were more on the loss aversion path.

2.2.6 Empirical studies carried out on Behavioral Finance

While there has been a detailed review on the different factors that affect investment decisions. This section seeks to review different studies at one point or the other how these factors have affected investment decisions especially in millennials. Ganesan (2012) who carried a research on the consumption, saving and spending habits of Millennials in Malaysia using the quantitative approach via questionnaires found out that investors regard investment as high risk and that mode of communication for investment purposes should be via social platforms. Karanam and Shenbagavalli (2019) also studied the investment patterns of millennials and found out that there are age preferences to investing and that all age types invest but the millennials are more inclined to other forms of investment particularly contemporary investment such as property, mutual funds. Income and profession are major determinants for Investing, the researcher in this study did not limit its investment purview to just the stock market. Waweru et al (2014) explains that behavioral factors are said to influence this type of investment rather than fundamental analysis

Coval and Shumway (2000) explains that in line with the prospect theory, investors who make gain or losses in the at midday are likely to take or avoid risk afterwards. Grinblatt and Han (2001) also supports this and terms it as a disposition effect as investors tend to sell off their stocks as soon as they make a profit from it.

Seiler et al. (2010) who did their study on mental accounting and false reference point discovered that this bias is present among investors who rely much on a particular reference point particular a false view. The false reference point is particularly attributed to regret aversion. Gazel (2015) argues that people who display this bias are trapped with fear that the decision they make towards an investment will not be optimal. Babajide and Adetiloye (2012) examined the impact of behavioral biases on the Nigerian stock exchange and discovered that there was a negative correlation between overconfidence and the stock exchange, as the investors are fueled with overconfidence the market underperforms. There was also a negative relationship between the framing and the stock market as investors prefer to make decisions subjectively.

Loh (2016) who conducted a survey on the influence of behavioral and traditional finance on millennials in Malaysia concluded that factors such as heuristics, prospect, market factors and herding had greater influence while traditional finance only contributes to the last phase od the decision process by investors. Tarjanne (2020) also conducted a survey on the influence cognitive biases on millennial investors in Finland and concluded that representativeness, herding and overoptimism had a great impact on Finland millennial investors as this is due to the fact that millennials live for the moment, value work and life so much at the expense of a fat salary. Kimani (2011) also did a survey on the influences of behavioral factors on individual investors and choices and found out that overconfidence and gambler's fallacy had the highest impact on investors decision which implied that the investors are confident enough that their ability and knowledge would play a great deal to foresee the outcome of their portfolio investment.

Chapter 3: Research Problem and Hypothesis

The focus of this research paper is to investigate the impact of psychological biases on Millennial's investors and how it affects their decision making in holding a well-diversified portfolio (Investments) in Nigeria. For this reason, the relationship between these variables would be tested.

The hypothesis for this research on which this present paper is built on previous empirical studies and the gaps identified, the following will be tested.

Hypothesis 1

H0. The use of Heuristics has no significant Impact on the Millennials investment decisions in Nigeria.

H1. The use of Heuristics has a significant Impact on Millennials Investment decisions in Nigeria.

Sub-Objectives

Does overconfidence form an important standard to investment decisions?

Does the length or wealth of experience play a significant role when making decisions?

Hypothesis 2

H0. Framing has no significant impact on Millennials Investment decisions in Nigeria.

H1. Framing has a significant impact on Millennials Investment decision in Nigeria

Sub-Objectives

Are there similar parameters that affect millennials investment decision making?

To what extent are millennials investors "reality bound" when making investment decisions?

Hypothesis 3

H0. Emotions has no significant impact on Millennial's investment decision making.

H1. Emotions has a significant impact on Millennial's investment decision making.

Sub-Objectives

To what extent does the volatility of the market affect investment decision make.

To what extent do they critically examine the market before making decisions pertaining to the investment.

Hypothesis 4

H0. Market impact has no significant impact with Millennial's investment decision making.

H1. Market impact has a significant impact with Millennial's investment decision making.

Sub-Objectives

To what extent does the millennial investors react to the changes in the market?

To what extent does the investor have a hold on the market?

Hypothesis 5

H0. Herding impact has no significant impact with Millennial's investment decision making.

H1. Herding impact has a significant impact with Millennial's investment decision making.

Chapter 4: Research Methodology

Kothari (2004) defined research methodology as the strategies and processes put in place to solve a research problem in the concerned field. He further explained that research methods are different from research methodology has the latter infuses the need to know why these strategies are needed to solve the problem in the research. In order to select appropriate strategies for this research problem, the research onion developed by Mark Saunders, Philip Lewis and Adrian Thornhill (2015) would serve as a guide to answer the research questions mentioned above. Figure 1 represents the onion layer, each of these sections would be properly addressed.

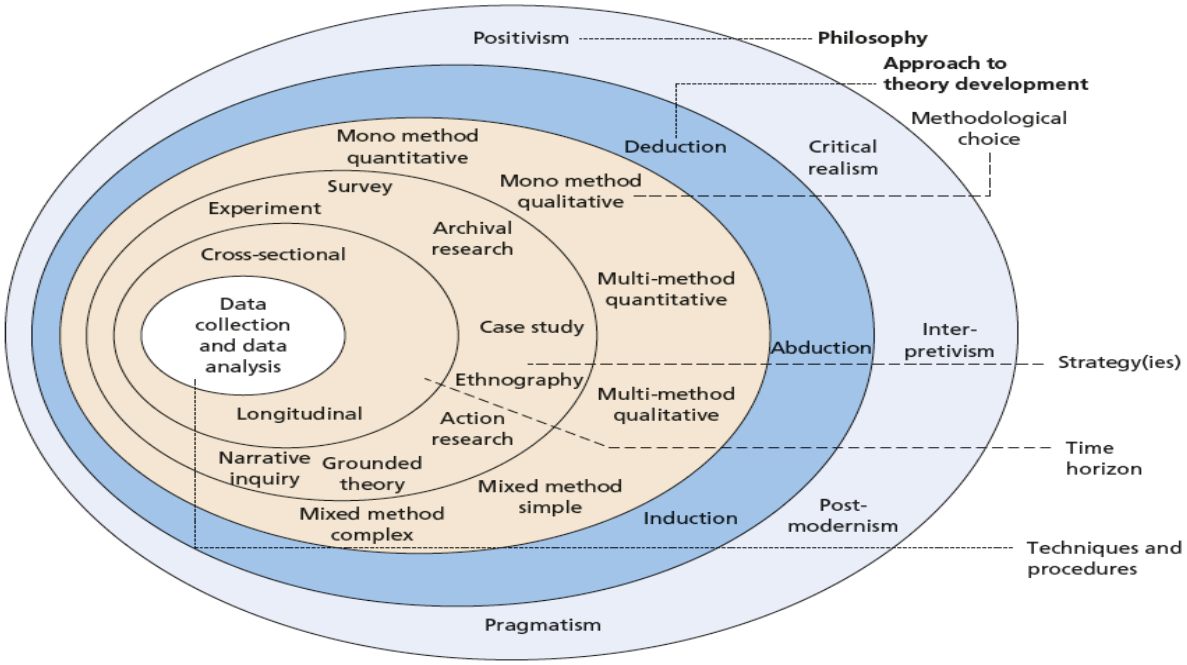

Figure 1. The research 'onion' (Saunders, Lewis and Thornhill, 2015)

4.1 Research Philosophy

Saunders et al (2007) explained that research philosophy refers to a set of beliefs and assumptions a researcher must adopts for knowledge development. Citing Burrell and Morgan (2016) explained that at every phase of the research assumptions would have to be made. The authors further explained that there are Three assumptions a researcher must consider: **Ontological assumption** which deals with realities within the confines of the research, **Epistemology assumption** which deals with satisfactory knowledge and how it can be conveyed to others, **Axiology assumption** deals with the responsibility of values and ethics in a research, to the extent of incorporating the researcher's value in the research being carried out be it in a neutral or otherwise manner. Heron (1996) explains that human values serve as a beacon for all actions carried out and in the place of research there is no exception. From the assumptions stated above the philosophy that would be adopted for this research is the Positivism Philosophy.

Saunders et al (2018) explains that the positivist philosophy under the ontological assumption's explains that there is only one reality and it's independent of any internal directions or perspectives, under the epistemology assumption it assumes that standard approach and processes are used to draw out outcomes by basis of relationships between two variables through observations and facts. The focus is to use pure "scientific empiricist method" without any form of personal bias intertwined, under the axiology assumptions positivism advocates for the researcher to be unbiased in the dealings and pursuit of the research.

4.2 Research Approach

The next layer of the research onion is the approaches used. Ragab and Arisha (2018) explains that there are two types of approaches: Deductive and Inductive approach. For the purpose of this research the deductive approach would be used. The authors explained that deductive approach follows a well-defined suitable structure that seeks to state the relationship between variables which is drawn out from a well of empirical studies. As regards the research on behavioral finance, there are a lot of resources to be used to develop a concise and clear position. Hypothesis were formulated based on the previous studies examined in the literature review section. Trochim and Donnelly (2008) refers to it as a "top-down approach". Figure 2 gives a breakdown of this approach.

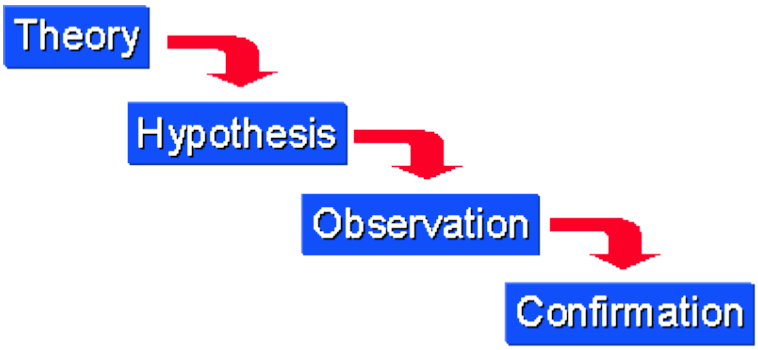

Figure 2: Deductive approach (Research Methods Knowledge Base, 2021)

Whilst the inductive approach begins by understanding the premise on which the research is built on via observation before formulating theories towards the research, it is also referred to as "bottom-up approach". This approach will not be adopted for this research.

4.3 Methodological choices

Methodological choices are the next layer in the research onion. Kothari (2004) defined research methods as the procedures and methods used when leading a research. It also forms part of the research methodology. Ragab and Arisha (2018) explains that when choosing the methods to use in the research it must be in tune with the assumptions, philosophy and approaches used. Research methods could be quantitative, qualitative or mixed in nature. For the purpose of this research, the quantitative methods would be most suited because this method is occasionally linked with positivism and deductive approach as explained by Bryman (2012) which the researcher is taking. Williams (2011) also explained that using the quantitative methods would help to analyze the relationship between variables that would yield a well-defined result. This will be done through the use of measurable data (i.e., numeric) with the application of statistical tools and models as explained by Creswell (2002).

Ragab and Arisha (2018) also stated that the "Quantitative methods include experiments, surveys, structured observations and structured interviews". Qualitative methods according to Williams (2011)

involves personal experiences rather than numerical analysis to have a better judgement and understanding of the phenomena through interpretation and surveying collected data. It is usually linked to the inductive and interpretivist approach (Guest, Namey, & Mitchell, 2012). Ragab and Arisha (2018) citing the pragmatist paradigm explains that the quantitative and qualitative methods should not be seen as opposites but as compliments, hence, the third approach the mix method. According to Azorín and Cameron (2010) it is a much better way of conducting a study as it helps to eliminate any weaknesses. For this research, the researcher would be adopting the qualitative methods as they would be appropriate compared to the others whilst the mixed methods might seem to be a better method for the research, due to time constraints the quantitative approach is a more suitable method. In view of existing studies such as Babajide and Adetiloye (2012), Waweru *et al*. (2008), Kengatharan and Kengatharan (2014) also conducted research using the quantitative methods. This is important in other to compare findings.

4.4 Research Strategy and Time Horizon

The research strategy is the next layer in the research onion. Lewis et al (2015) defined research strategy as a step-by-step analysis used to answer the research problem. For this research the survey has been chosen as the most suitable strategy for this research and the times that we are in. in other to keep to the social distancing rules as directed by the government because of COVID 19, the survey strategy is used. Lewis *et al* further explained that this type of strategy should be in line with the choices, approach and philosophy the researcher as proposed. Kothari (2004) explained that a section of the entire population (sample) would be examined and the finding would be implied on the entire population. In this research paper, the researcher seeks to know the impact of the behavioral biases have on millennial Investors towards their decision making and substantial number of partakers would be needed in order to infer the finding on the entire population of millennial investors, reason why the survey would be chosen as the most appropriate strategy, Lewis et al (2015) explained that the survey strategy would allow the researcher to carryout a quantitative approach and use statistical tools that would get results that can answer the research questions. It's also worthy to note that due to time constraint, this research would be cross-sectional.

4.5 Data Collection and Analysis

Data collection would be through primary data via survey. Kothari (2004) explained that Primary data collection could be gathered through experiments or survey (using questionnaires). Whilst using survey as a primary source of data collection, the research would also rely partly on existing data. Since part of this research is to contribute to existing knowledge and to intend to fill the gap in this research. The secondary data that would be used for this research would be the EBSCO Discovery Service which is a search engine provided on the National College of Ireland Library website which allows the researcher access to research records.

4.5.1 Sample Size and Survey Design

Saunders et al (2009) explained that it is not feasible for a researcher to collect data on the entire population because of time and funds constraint and that examining a smaller group that has the same characteristics of the entire population is more acceptable. Cohen, Monion and Morris (2018) explains that the least sample size for a survey should be 100. The number of millennials investors in Nigeria has not specifically been mentioned in any statistical website, hence we would base the sample size in cohen *et al* (2018). Kothari (2004) also categorized the sampling techniques in to two; Probability sampling and non-probabilistic sampling. For this research the non-probabilistic sampling would be adopted, to be more precise the convenience (Haphazard) techniques (i.e., selecting participant that would be conveniently available to be surveyed) would be used in accessing the participants that would take part in the survey. The survey would

be created through google forms. The Likert scale would be used for the questionnaires. Nemoto and Beglar (2014) explained that the Likert scale is the best technique in order to access an individual psychological buildup.

The questionnaire built for this research and their sources can be seen in the Appendix I. Before the participants started the survey, they were asked three questions in Section 1. (i). If they wanted to partake in this study (ii). Their Nationality (iii). And if they were investing. These questions were asked in other to filter the participants who did not meet the criteria. The researcher was particularly interested in the nationality as the restudy was based on millennial investors in Nigeria which 99% of the participants were from Nigeria. Section 2 asked questions on the sociodemographic characteristics of the respondent such age, marital status, gender, educational status, what type of Investor and years of experience while section 3 asked questions based on the behavioral themes being studied for this research. It is important to state that the researcher used validated questionnaires that has been used by other researchers. These questions helped identify the dependent and independent variables and their impact. The 5-point likert scale was used which ranged from 1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree.

4.5.2 Pilot Study

A pilot study was completed to identify any potential problems with the survey. De Vaus (2002) explained that in other to test how valid the questionnaires are it should be administered on a smaller set of participants before sharing to the actual participants. The researcher asked two millennial investors to fill the survey as well as feedback. The feedback gotten from them were that some of the questions were too ambiguous and time taken to fill the questionnaire was too long. This helped to strengthen the questionnaire and provide clarity on some of the questions addressing the biases. The researcher was able to come up with a few definitions such as describing who an institutional or retail investor is and descriptions that would aid forthcoming participants on how to answer. As to the time taken to fill the questionnaire, the researcher put up the maximum number of minutes to fill the questionnaire so that participant can decide as to whether to respond or not.

4.5.3 Data Analysis

Descriptive Statistics

Descriptive statistics would be used to give a better presentation and summary of the responses gotten by the participant. The use of tables and graphs would be used for the descriptive statistics.

Data Cleaning

Since Google forms was used for the survey, the number of responses were monitored and gotten, which the collected data was imported in to an excel file and was analyzed using the Statistical package for Social Sciences (SPSS) software by IBM. Firstly, the data was cleaned, any incomplete questionnaire was automatically erased as it was required for the participants to fully complete each section before submitting, so the burden was eased. As previous studies conducted survey like (Rahman and Gan; 2020, Riaz and Iqbal, 2015; Tarjanne 2020) they analyzed their data using the SPSS software and also to test the reliability of the questionnaires in other to attempt to know the relationship between the behavioral factors and investors decision, the Cronbach's alpha statistic was used. The researcher also intends to use Cronbach's alpha statistic to test the "internal consistency" of this survey. The dependent variable is Investment decisions while the independent variables are Heuristics, Framing, Emotions, Market Impact and Herding.

Inferential Statistics

This statistic is used to test hypothesis in other to get to a conclusion. In the next chapter the hypothesis set out by the researcher would be tested using the spearman rank order correlation and exploratory factor analysis using the SPSS software.

The spearman rank correlation would be used to help us to know the relationship between variables such as the relationship between the age, experience and education level and the behavioral factors. Cohen *et al* explains that this type of correlation can be used to know the relationship between two ordinal or continuous variable.

The Exploratory Factor Analysis (EFA) is a statistical tool commonly used in the evolution and attest to the truth of psychological theories (Marley, 2018). This analysis is meant to identify the factors in which the behavioral variables belong to, also to have an understanding of the relationship between the variables being measured and also to test its validity. The Kaiser – Meyer – Olkin (KMO) would be used to measure the "the sampling adequacy" of the data collected for the factor analysis as this would help the researcher to know if the intended study (variables) is properly being measured while the Bartlett's test for sphericity is used for comparisons between correlation matrix and to see if there is any prolix in the measured variables (Snedecor, George, Cochran and Williams (1989).

4.6 Ethical Considerations

The ethical considerations as regards this research would and has follow strictly the ethical guidelines provided by the National College of Ireland. All information gotten for the purpose of this research would be deemed confidential. Section 1 of the questionnaire helped to clarify any doubts concerning the anonymity of the participants and their responses.

Chapter 5: Results

This chapter presents the results from the statistical analysis. For easier dissection, this section would be divided in to three parts. The first part would consist of the reliability test, the second part is made up descriptive statistics which would contain graphs and tables for easier illustration of the results gotten from the responses while the third part is made up of the inferential statistics. Also, the hypothesis mentioned in the research problem would be tested and the impact and correlation of dependent and independent variables would be analyzed. The analysis would be divided in to two;

- Demographic analysis: the first part consists of the personal details of the respondents such as age, marital status, investor type, experience, qualifications and their findings in relation to the investment behavior. Personal details such as religion and ethnicity were not included as the purpose of this research is not coming from that perspective.
- Behavioral factors analysis: the second part consists of various questions that addresses the impact of the behavioral factors on the investor's decisions.

5.1 Reliability Test

The Cronbach's alpha is used to test how reliable or the internal consistency of the questionnaire (survey). According to Hulin, Netemeyer and Cudek (2001) an accepted rubric for Cronbach alpha is between 0.60 to 0.70, Cronbach alpha of 0.80 or more is termed as very good, however a Cronbach alpha of more than 0.90 or higher indicates redundancy as its not necessarily deemed as good. For the purpose of this research the acceptable Cronbach alpha is with 0.6 and more. In Table 1, the researcher was able to assess the reliability of the 27 questions asked to the participants through the of the SPSS software, the Cronbach alpha gotten is 0.642

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.642	.667	27

Table 2: Cronbach's Alpha assessing the reliability of demographic and behavioral factors

Another consideration towards the reliability of this survey taken is biases or threats that can affect reliability. Saunders, Lewis and Thornhill (2009) explain that respondents are prone to the "participant error and participant bias". Participant error occurs when the participant undertaking a survey is affected by an occurrence which may affect the respondents' answers to the survey prior and after the occurrence. It is sometimes called the late response bias (Armstrong and Overton, 2007) while the participant bias happens when the respondents try to respond to the survey in favor of the questionnaire i.e., hoping to respond in a way that the researcher would want then to respond (Saunder *et al*, 2009). In this research, when the survey was distributed, the first week there was a high response to the questionnaire after the first week there were slow responses. In other to verify whether the presence of participation error was present the researcher used the Wilcoxan test to test if the first 51 responses versus the last 51 responses were statistical different and the results in Table 3 with a significance level of more than 0.05 shows that there was no statistical difference in the responses below. For the prevention bias, feedbacks were gotten from a few participants who were very much interested in the questionnaire as they were very involved in investment strategy and it was obvious that some of the factors were just being recognized by the participants.

	Overconfidence		Representativeness		Gambler's Fallacy		Framing	Loss Aversion
Z	-2.889[b]	-.070[c]	-.221[c]	-1.268[b]	-1.518[b]	-1.383[c]	-.305[c]	-.008[b]
Asymp. Sig. (2-tailed)	0.004	0.944	0.825	0.205	0.129	0.167	0.760	0.994

	Mental Accounting		Regret Aversion	Illusion of Control	Optimism		Past trend of Stock	Overreaction
Z	-3.261[c]	-1.670[c]	-1.327[b]	-.327[b]	-1.468[b]	-1.221[b]	-2.544[c]	-.232[c]
Asymp. Sig. (2-tailed)	0.001	0.095	0.185	0.744	0.142	0.222	0.011	0.816

	Herding			
Z	-.009[c]	-1.760[b]	-1.690[c]	-.104[c]
Asymp. Sig. (2-tailed)	0.993	0.078	0.091	0.917

Table 3: Testing of late response bias

5.2. Descriptive Statistics

Demographic Characteristics

In this section, 102 participants completed this survey and the main platforms that were used to distribute the questionnaires was WhatsApp Platform as there were filled with millennials who were in social groups who invest. The survey was sent to 700 participants individually and in groups. Only 102 participants responded to the questionnaire. All sections of the questionnaire were specified as *required as the participants will not be able to move to the next section. Hence, all questionnaire was filled.

This research intends to analyze the impact of behavioral biases on millennial investors. Table 4 gives us a summary of the total number of individuals that filled the survey and specifically the age range.

		Frequency	Percent	Valid Percent
Gender	Male	73	71.6	71.6
	Female	29	28.4	28.4
Age	18 - 22	5	4.9	4.9
	23 - 30	68	66.7	66.7
	31 - 40	24	23.5	23.5
	41 - 50	3	2.9	2.9
	Over 50	2	2.0	2.0
Educational Level	Third Level Education	50	49.0	49.0
	Masters Level Education	48	47.1	47.1
	Phd. or Doctorate	4	3.9	3.9
Marital Status	Single	75	73.5	73.5
	Married	25	24.5	24.5
	Divorced	1	1.0	1.0

	Defacto	1	1.0	1.0
Investor Type	Retail/Individual	97	95.1	95.1
	Institutional/Professional	5	4.9	4.9
Experience	Less than a year	55	53.9	53.9
	1 year to 4 years	34	33.3	33.3
	5 years to 9 years	10	9.8	9.8
	10 years and above	3	2.9	2.9
Nationality	Nigerian	101	99.0	99.0
	Irish	1	1.0	1.0
	Total	102	100.0	100.0

Table 4: Demographic Characteristics

Gender

In the survey filled by the participants, there were more of men than women. The percentage of women is 28.4% which makes up to a quarter of the pie chart. The inequality in this distribution shows that men are more inclined to investing than women

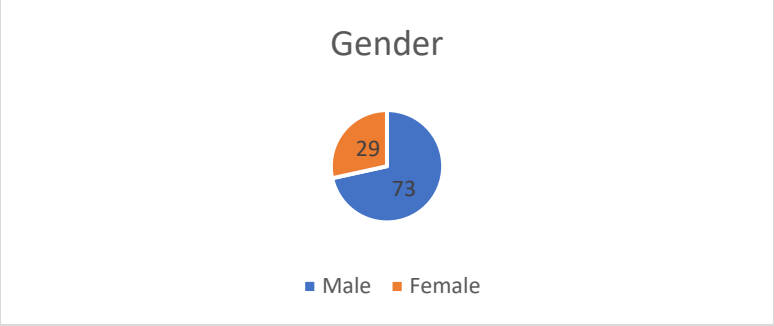

Figure 3: Demographic characteristics - Gender

Age

The age range that filled the survey most were 23 – 30 (66.7%) and 31 – 40 (23.5%) which are called the millennials. As this meets one of the essential requirements for this survey. Also, another reason would also be social platform that was used to share the survey also tilted towards the millennial generation.

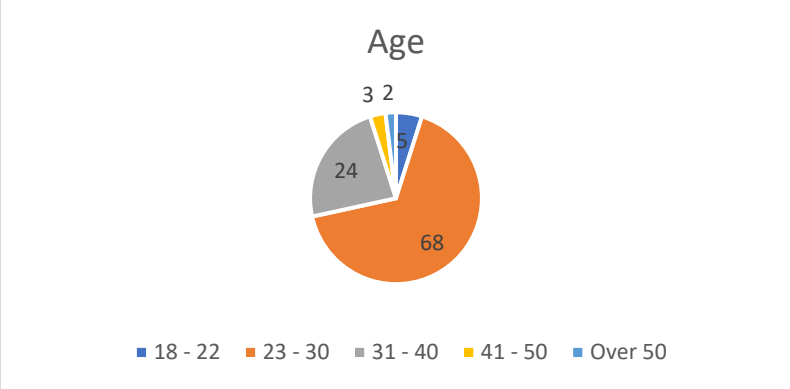

Figure 4: Demographic characteristics - Age

Educational Level

The next characteristics is the educational level. Out of 102 participants 49% were third level education, 47.1% were masters level education and 3.9% held a PhD. Or Doctorate degree as seen in Table 3. It is important to state that other educational qualification was stated in the questionnaire but just the three levels stated were chosen by the participants, this also indicates that they are fully aware the purpose of this survey.

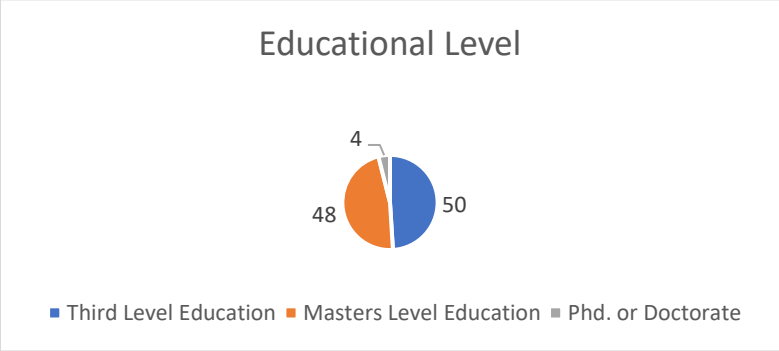

Figure 5: Demographic characteristics – Educational Level

Marital Status

In this variable, majority of the investors were single (73.5%) or married (24.5%) while the others were separated or defacto. Defacto means a couple living together but not married.

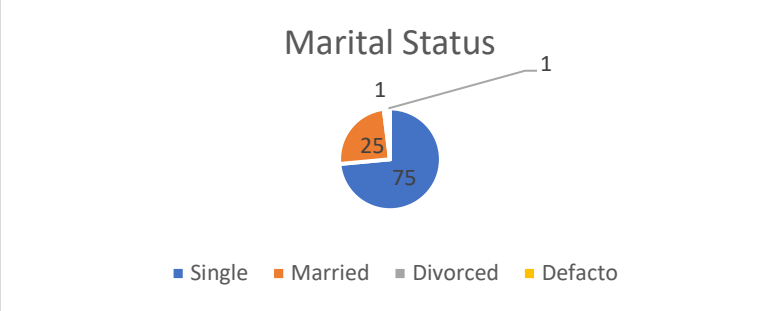

Figure 6: Demographic characteristics – Marital Status

Investor Type

In table 3, it shows that 95.1% of the participants were retail investors while the rest are institutional investors.

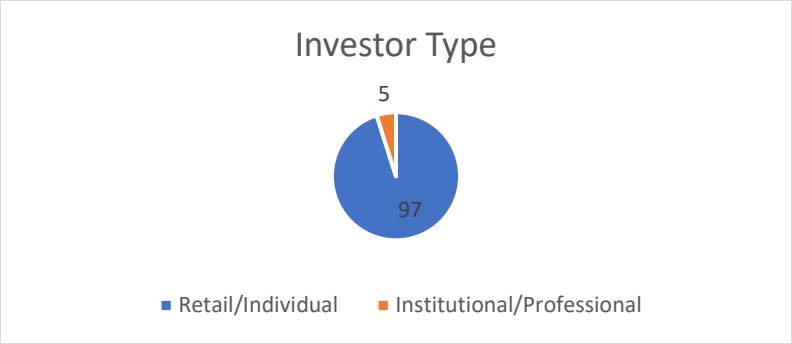

Figure 7: Demographic characteristics – Investor type

Experience

Majority of the participants had less than a year (53.9%) or 1 to 4 years (33.3%) experience in investing while about a few (9.8%) have 5 to 9 years of experience. While this pie chart gives us an overview of the experience. The age group of millennials that falls between 23-40 shows that 20 females and 32 males have investing experience of less than a year, 6 females and 28 males have an investing experience of 1 years to 4 years and 1 female and 6 males have 5years to 9 years. None of the millennials have an investing experience of 10 years and above while the older generation have more than 10 years' experience.

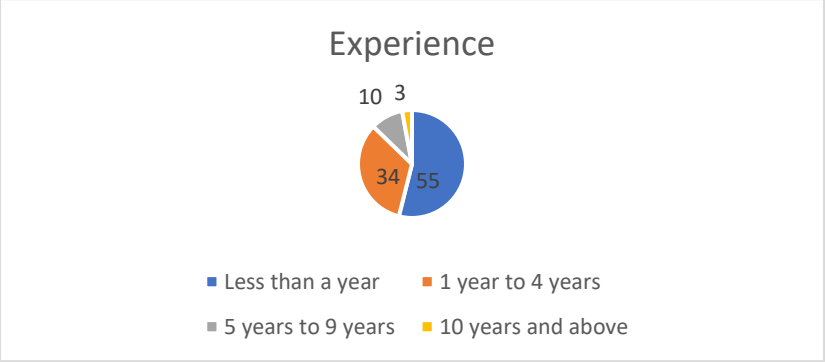

Figure 8: Demographic characteristics - Experience

Female	Less than a year	1 year to 4 years	5 years to 9 years
Married	2	5	1
Single	18	1	

Male	Less than a year	1 year to 4 years	5 years to 9 years
Married	3	9	2
Single	29	19	4
Defacto			1

Table 5: Millennials Investing experience

Nationality

As the researcher conducting this study outside Nigeria, it is important to note that the nationality is stated in the survey to guide the research. 99% of the participants are from Nigeria and only 1% is Irish. The millennials targeted are Nigerians.

5.2.1 Factor Analysis on Behavioral factors and their impact on millennials Investment decisions.

Exploratory factor analysis helps with the behavioral variables and put them in to factors. From the analysis done it showed that the behavioral factors should be grouped in to seven factors - Five factors (themes) which explored the impact of the biases on millennials investment decision while remaining 2 factors explored the relationship and influence of behavioral factors on experience and education at the Eigenvalue of 1.14, KMO of 0.623 at a significance of 0.000 as illustrated in Table 6, % of total variance explained is 66.25% (Please see Appendix II). These values tell us that the factor analysis for these variables is appropriate and suitable as its is more than 0.5

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.623
Bartlett's Test of Sphericity	Approx. Chi-Square	548.913
	df	190
	Sig.	0.000

Table 6: KMO and Bartlett's Test

5.2.2 Impact level of Behavioral Factors

Table 7 below gives the impact levels of the behavioral biases used in the survey. Below is a condition for the various levels of impact the behavioral factors have on millennial investors, also used by Kimani 2011; Tarjanne 2020 and Loh 2016.

- A mean value of 2 is considered to have very low impacts on millennials investing decisions
- A mean value within the range of 2 – 2.9 is considered to have low impact on investment decisions
- A mean value of 3 – 3.9 is considered to be moderate impact on investment decisions
- A mean of 4 – 4.9 is considered to have a high impact on investment decisions
- A mean of 5 – 5.9 is considered to have a very high impact on investment decisions

	Biases	Minimum	Maximum	Mean	Std. Deviation	Impact
Heuristics	Overconfidence	1.00	5.00	2.9608	1.12507	Low Impact
	Overconfidence	1.00	5.00	2.9412	1.05139	Low Impact
	Representativeness	1.00	5.00	3.4804	1.02184	Moderate Impact
	Representativeness	1.00	5.00	3.3235	1.11836	Moderate Impact
	Gambler's Fallacy	1.00	5.00	3.1569	1.03163	Moderate Impact
	Gambler's Fallacy	2.00	5.00	3.7843	0.91875	Moderate Impact
Prospect	Framing	2.00	5.00	3.7549	0.89483	Moderate Impact
	Loss Aversion	1.00	5.00	3.4118	1.11118	Moderate Impact
	Mental Accounting	1.00	5.00	3.9804	0.73093	Moderate Impact
	Mental Accounting	1.00	5.00	2.7745	1.02355	Low Impact
Emotions	Regret Aversion	1.00	5.00	3.4608	0.90839	Moderate Impact
	Illusion of Control	1.00	5.00	3.9020	0.75137	Moderate Impact
	Optimism	1.00	5.00	3.6863	0.83227	Moderate Impact

	Optimism	1.00	5.00	3.3922	0.91367	Moderate Impact
Market Impact	Past trend of stocks	1.00	5.00	3.8039	1.04398	Moderate Impact
	Overreaction	1.00	5.00	4.1373	0.67544	High Impact
Herding	Herding	1.00	5.00	3.6471	0.88605	Moderate Impact
	Herding	1.00	5.00	3.5490	0.88583	Moderate Impact
	Herding	1.00	5.00	3.3627	0.95222	Moderate Impact
	Herding	2.00	5.00	3.8627	0.79652	Moderate Impact

Table 7: levels of impact of the behavioral factors

From the above, it can be concluded that the market factors or impact has the highest impact on millennial investment decision making as Overreaction has a mean of 4.13 and the lowest standard deviation of 0.675 which explains that responses gotten from the participants is very close to the mean with the least variation which is an indicator of consistency followed by past trend of stocks which has a mean of 3.80. this shows that the millennial reacts quickly to new information and also include past trend of stocks even if it's in favor or not in their investment. Figure 9 gives us a pictorial illustration.

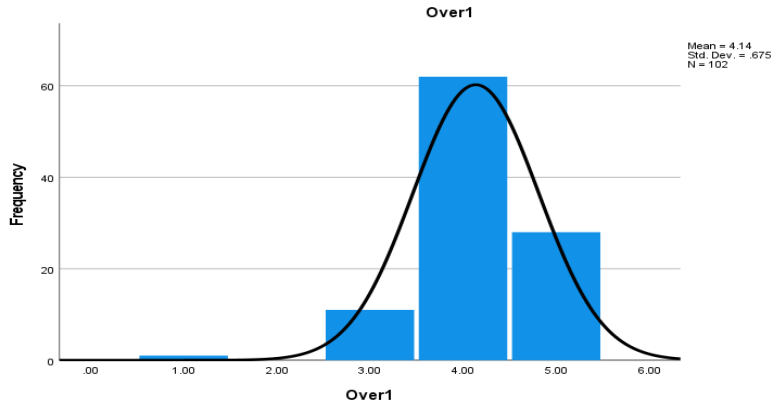

Figure 9: Histogram of the Overreaction bias

The next ranked impact on investment decisions is Emotions and Herding with impacts on Investment decision at moderate levels according to Table 7. Prospect and heuristics showed the least impact on investment decisions with a mixture of low and moderate levels. Emotions such as the illusion that they're in control of their investment (illusion of control) and greatly optimistic (optimism) about their investment shows that they have a moderate impact on millennial investors. Herding also has a moderate impact on millennials as the influence of an investor reaction, conversation with a friend or colleague could also change the course of their investment decisions while Heuristics and prospect theory relatively affects millennial investor decisions, the trust in one's self to make the right decision (overconfidence is low) while representativeness and gamblers fallacy has a moderate impact on investment decisions. Framing and loss aversion has a moderate impact on investment decision while mental accounting has a low impact on millennial investment decisions. From this overview, it is safe to say that the behavioral factors range mainly from moderate to high impact on millennial investors.

5.3 Inferential Statistics

This section seeks to show the relationship or correlation between the demographic characteristics and the behavioral factors. The demographic characteristics mainly analysed would be Age, Experience and Education. The spearman rank correlation via SPSS would be used for this Analysis.

Age

From Table 8, we can see that there is moderate relationship between overconfidence and optimism because their correlation +/-3 and +/-4 according to Akoglu (2018). As this is a positive correlation, this implies that overreaction and optimism are 2 biases that will greatly influence the millennial investors as they grow older. There is also a weak correlation between gambler's fallacy and millennials although weak but this proves significant as they can also be influenced by this bias as they age.

		Overconfidence	Representativeness	Gamblers Fallacy	Framing	Loss Aversion	Mental Accounting
Age	Correlation Coefficient	.362**	0.095	.257**	0.183	-.231*	.225*
	Sig.	0.000	0.344	0.009	0.065	0.019	0.023
		Regret Aversion	Illusion of control	Optimism	Past trend of stock	Overreaction	Herding
Age	Correlation Coefficient	-0.025	.198*	.407**	0.131	0.119	0.145
	Sig.	0.806	0.046	0.000	0.189	0.232	0.146

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 8: Correlation between age and behavioral factors

Experience

Table 9, tell us that there is a moderate relationship between heuristics (overconfidence and gambler's fallacy) and emotions (optimism and illusion of control). This implies that as experience continue to increase these biases will continue to influence their decision making. There is also a negative moderate relationship between experience and loss aversion, this implies that this bias will have less influence on the millennials investment decisions as they have more experience in investing. All other correlations have a weak correlation with experience.

		Overconfidence	Representativeness	Gamblers Fallacy	Framing	Loss Aversion	Mental Accounting
Exp	Correlation Coefficient	.550**	0.080	.315**	0.151	-.431**	.265**
	Sig.	0.000	0.427	0.001	0.129	0.000	0.007
		Regret Aversion	Illusion of control	Optimism	Past trend of stock	Overreaction	Herding
	Exp Correlation Coefficient	0.119	.304**	.390**	.204*	0.160	0.090
	Sig.	0.232	0.002	0.000	0.040	0.108	0.368

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 9: Correlation between experience and behavioral factors

Education

Table 10, tell us that there is also a moderate relationship between overconfidence and gamblers fallacy with education. This implies that millennials with advanced education would be influenced by these factors, while other correlations show a weak relationship between education and other factors.

		Overconfidence	Representativeness	Gamblers Fallacy	Framing	Loss Aversion	Mental Accounting
Edu	Correlation Coefficient	.377**	0.072	.393**	0.081	-.254*	0.188
	Sig.	0.000	0.474	0.000	0.416	0.010	0.058
		Regret Aversion	Illusion of control	Optimism	Past trend of stock	Overreaction	Herding
	Edu Correlation Coefficient	-0.043	0.132	.217*	.199*	0.143	-0.004
	Sig.	0.671	0.187	0.028	0.045	0.152	0.968

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: Correlation between education and behavioral factors

From the above, this research rejects the null hypotheses 1,2,3 & 4 which states that:

- H0. The use of Heuristics has no significant Impact on the Millennials investment decisions in Nigeria.
- H0. Framing has no significant impact on Millennials Investment decisions in Nigeria.
- H0. Emotions has no significant impact on Millennial's investment decision making.
- H0. Market impact has no significant impact with Millennial's investment decision making.
- H0. Herding has no significant impact with Millennial's investment decision making.

Further findings will be discussed in the next chapter.

Chapter 6: Discussion

This chapter represents key findings gotten from this research analysis as per the research problem stated. The main goal of this research is to study the impact of the behavioral factors on millennial investment decisions while the secondary goal is to see the extent of the correlation between certain sociodemographic characteristics such as Age, Experience and Education.

6.1 The Impact Levels of Behavioral Factors on Millennials Investment decisions - Findings

This section is set to identify which of the behavioral factors mostly impacted millennials investment decisions using the hypothesis statement with their sub objectives.

H1. The use of Heuristics has a significant Impact on Millennials Investment decisions in Nigeria.

Sub-objectives

Does overconfidence form an important standard to investment decisions?

Overconfidence, representativeness and gambler's fallacy were the three factors examined under the heuristic dimension. From the analysis done, it showed that overconfidence had a low impact (2.95) on millennials investment decisions while representativeness (3.36) and gambler's fallacy (3.45) have a moderate impact on millennials investment decisions. This shows that investors think they can predict the outcome on their investment the information gathered as they believe goof performance on their stock will continue to persist. According to Tversky and Kahneman (1971) when representativeness is present investors tend to overvalue their ability to predict the outcomes of an investment hence ignoring other psychological factors such as gambler's fallacy. Based on their survey in 1972 it was found out that there is a link between representativeness and gambler's fallacy. Tarjanne (2020) explained that investors display all kind of biases consciously or unconsciously, such biases are usually associated with overconfidence or excessive optimism. Therefore, from our findings despite the fact that over confidence has a low impact on millennials investment decision, this research is in support of the previous studies mentioned. Hence, overconfidence is a very important standard to investment decisions as this particular bias should be used as the basis for the presence of other behavioral factors.

Does the length or wealth of experience play a significant role when making decisions?

Table 9 of Chapter 5 explains that the spear man rank correlation was used to analyze the correlation between experience and investment decisions. From the analysis it was shown that overconfidence (0.550) and gambler's fallacy (0.315) had very strong and moderate relationship with experience. In the survey it was shown that majority of the participants had an experience of less than a year to 1 to 4 years, this indicates that investors with less experience tend to be more influenced by these behavioral factors rather than those with much more experience. This can be seen in the case of Dispa (2020) who measured behavioral factors in the stock market, the researcher concluded that investors with higher experience of 5 years to 10 years and above tend to be less influenced by the behavioral factors. Table 11 gives an overview of the point made. The length of experience plays a significant role when making investment decisions.

			Retail/Individual	Institutional
Experience	Less than a year	Count	53	2
		%	96.36%	3.64%
	1 year to 4 years	Count	32	2
		%	94.12%	5.88%
	5 years to 9 years	Count	9	1
		%	90.00%	10.00%
	10 years and above	Count	3	0
		%	100.00%	0.00%
Total		Count	97	5
		%	95.10%	4.90%

Table 11: Length of Experience

H1. Framing has a significant impact on Millennials Investment decision in Nigeria

Framing, loss aversion and mental accounting were the three factors examined under the prospect theory dimension. It showed that framing (3.75) and loss aversion (3.41) had more impact on investment decisions than mental accounting (3.38) although they were all above the mean of 3 which shows moderate levels. Framing had the most impact, this Is evidence that the way in which an investor can fully comprehend an information depends on the manner in which the information is brought to them. This table shows that majority of the respondents agreed to this framing question. This also support previous existing studies in the literature section by Diacon and Hasseldine (2007), Gonzalez, Dana, Koshino and Just (2005), Ritter (2003) and Wahla, Akhtar and Shah (2019). These studies can be seen in the literature review, for further insight you can visit academical websites or the reference page. Table 12 give us the responses of the participants in relation to framing – majority of the responses were tilted towards agree and strongly agree.

		Count	%
Question: You prefer to make investment decisions using pictorial appearances rather than just a piece of information in words.	Strongly Agree	21	20.59%
	Agree	45	44.12%
	Neutral	26	25.49%
	Disagree	10	9.80%
	Strongly Disagree	0	0.00%
	Total	102	100.00%

Table 12: Responses from participant on framing

Sub-objectives

Are there similar parameters that affect millennials investment decision making?

Loss aversion and mental accounting are similar parameters under the prospect theory that have moderate and low impacts on millennials investment decision respectively. From the empirical studies of meheran

(2009) and mbakuala (2012), they concluded that the presence of framing boosts the presence of other biases. Mbakuala (2012) explains that in investors reaction to losses being made, framing effects are incorporated while Meheran (2009) explained that the state at which people separate their funds in to different account is as a result of narrow framing which could deter good investment decisions.

To what extent are millennials investors "reality bound" when making investment decisions?

The presence of framing, loss aversion and mental accounting gives us the extent to which investors are reality bound. From the above findings, we can see that these investors try to have a coping mechanism in which helps them make investment decisions. These are called fillers in which information can be fully comprehended. Polic (2009) explains that processes in decision making are some what complex and are treated from various viewing points. Gigerenzer (2008) stated that "bounded rationality is neither optimization, neither optimization under constraints or irrationality". Hence, for investors to make decisions realistically there must be a well thought out way or instruction within its constraint of grasp and awareness.

H1. Emotions has a significant impact on Millennial's investment decision making.

Regret aversion, illusion of control and optimism were the three factors examined under the emotion dimension. Regret aversion (3.46), illusion of control (3.90) and optimism (3.54) had a mean above 3.0 which shows that they had moderate impacts on millennials investment decision. The illusion that investors have control over the outcome of their investment and being excessively optimistic about their decision could lead to regret aversion as they end up selling their winners too quickly with the fear that the market price might fall ending up realizing their gains on time and retaining their loosing stock in hopes that the financial market might work in their favor by the market price increasing. An underlying bias from another dimension is overconfidence as it triggers the presence of the above factors mentioned. Riaz and Iqbal (2015) in their research saw that optimism had a significant impact on investment decisions while illusion of control had the opposite. This researcher begs to differs as both biases have a significant impact on investment decisions.

Sub-objectives

To what extent does the volatility of the market affect investment decision make.

Yahyazadehfar, Ghayekhloo, and Sadeghi (1985) explains that emotions have a very high impact in our everyday lives even in the sphere of investment decisions, he further says that as far as the market continue to be very volatile, emotions cannot be eluded and plays a very big role. The awareness of this emotional biases helps to lighten the burden (to an extent) of the investor. The fear of entering in to an investment and ending up regretting or rejoicing or the feeling of being optimistic about an investment and the illusion that there's total control on an investor investment winning would be as a result of the markets volatility. These findings is in support of Baker and Nofsinger 2010 and Riaz and Iqbal 2015 as per the literature review.

H1. Market impact has a significant impact with Millennial's investment decision making.

Past trend of stocks and overreaction were the two factors analyzed under the market factor dimension, with 3.80 and 4.13 have the most impact under the behavioral dimensions explored on investment decisions. This impact showed that investors are aware that one of the critical basics towards investment decisions is Information. While the millennials might not have a good understanding of the market or they are starting to understand the financial market, they understand that information and the trends – past and present about the market may drive the course of their investment decisions. DeBondt and Thaler (1995) explains that when the precept for behavioral finance is aligned, the investor may be able to react appropriately to the market. Since information is very important, official release of information by the financial market would

be more reliable than rumored or invalid information as this may have severe consequences on the investor's decision.

Sub-Objectives

To what extent does the millennial investors react to the changes in the market? / To what extent does the investor have a hold on the market?

Kimani (2011) and Loh (2016) explained that the high impact of market factors on investment decisions is directly linked to the sociodemographic characteristics of the respondents of the survey. More than 90% of the investors hold an undergraduate or master's degree and they are also retail investors but their lack of enough experience in the financial markets makes it difficult to appropriately react or somewhat have a hold on the market. But they have just enough education to considers these factors in their investment decisions. On the contrary, Dispa (2020) explained that institutional investors tend to have a better reaction to the market with the influence on fundamentals of underlying stock using good criterion and techniques to make their investment decision. While this factor was not measured, future studies would be needed for this assumption to be valid.

H1: Herding has a significant impact with Millennial's investment decision making

Herding was the last factor to be analyzed. This factor has a mean of 3.6, this shows that it has a moderate impact on investment decisions. There is evident that the millennial investors are affected by other investors investment decisions, the reaction of investors, their investment process and personal involvement with colleagues and friend could make them follow the same process adopted in investing. This is also aligned with the literature studies from chapter 2. Also, the fear of missing out (FOMO) is another thing that could like influence a millennials decision as explained by Tarjanne (2020). This study supports this.

6.2 Correlations between the behavioral factors and millennials investment decisions

Two main sociodemographic were used for this relationship: Experience and Education. Overconfidence, representativeness, illusion of control, optimism and past tend of stock has a positive relationship with investment decisions which was explained earlier, that with less experience these biases would have a significant impact on their investment decision while there is a negative correlation between experience and loss aversion this explains that millennial investor tend to be less impacted by loss aversion on their investment decisions. This means that investors tend not to be loss averse as they prefer to drop their losses and retain their wins. While overconfidence is seen to make investors make wrong decisions there might just be some good to it. Table 9 of chapter 5 shows us that overconfidence had the strongest correlation with experience, there must be a threshold to an acceptable level of confidence an investor should have when making decision. In times of uncertainty, that bias might just be needed to make decisions but must be in clever ways.

The correlation between education and the behavioral factors are pretty much the same, only that experience has a much higher correlation with the behavioral factors.

From the above, Tarjanne (2020) explains that millennials are narcissists, they like to go against the norm, and with excessive amount of information allows them to take decision quickly. Because of this traits present, it allows these behavioral factors to be excessively dominant when making their decisions. We can also see that these biases are intertwined and cannot be separated. Because of their self-love, overconfidence is seen to have a very high correlation of 0.550, this researcher feels it is the root of other underlying factors which adversely affects investment decisions.

6.3. Limitations of the study

This section gives the limitations of the study that was identified by the researcher.

For the purpose of this research, the number of participants that were able to fill the survey were 102, the researcher feels that in other to capture a more detailed analysis more, there should have been more participant. Due to time constraints as explained in chapter 4 – Research Methodology, it made it difficult to have more participants fill the survey.

In support of the above, the type of sampling used also contributed. Non-probability sampling was chosen using the haphazard (convenience technique) technique i.e., participants that would be conveniently available to fill the survey. Also, most of the participants were either single and married while just few participants were divorced or "defacto", this made it difficult to be representative, probably the use of other sampling techniques such as stratified sampling would have been more suitable for this research but as stated earlier the time constraints was very severe for this research. However, the main aim of this research is to allow Nigerian Millennial investors to be fully aware of the behavioral factors that impacts their investment decisions. Participation bias or error might be inherent as there is the possibility that participant is answering this in favor of the researcher

Another Limitation is that the key findings found out from the analysis cannot be inferred on other millennials in other parts of the world because of individual preferences and different approaches to life and investment.

6.4. Further Research

While the gap of investigating the impact of behavioral factors on millennial investment decisions in Nigeria has been filled. Investigating these factors or more on other developing countries such as Ghana, Niger, Angola, Mali etc. would help see the impact in a new light whether similar or different factors affect investors in developing countries. Also, exploring the distinction between developed and developing countries of what drives different investors (professional or individual) to invest differently is worth researching on. It would be interesting to know how these investors make their decisions because the way an economy is run is by the different decisions made by the population of that country.

Most researches on traditional finance and standard finance have been done separately. Different empirical studies have been built on this separate researches. Analyzing the impact levels of this opposite theories would be worth researching on.

Chapter 7: Conclusion

The sole objective of this research was to know the impact of behavioral factors on millennials investment decisions. This objective has been achieved with the impact levels seen and the correlation seen between the sociodemographic and the behavioral factors. The behavioral dimensions – Heuristics, Framing (Prospect theory), Emotions, Market impact and herding were seen to significantly have high and moderate impact on millennials investment decisions. It is safe to say that this gap has been filled particularly in a developing country such as Nigeria, proving that these behavioral factors exist in millennial investors.

The market factors had the greatest impact which shows that information is one important factor to be considered when investing as it can trigger how an investor can react (over or under) to price changes and also trail past trend of stocks in the financial markets (Nader and Zahra,2018). Herding was next which showed that Investors are also inclined to their colleagues, friends and can consider the opinions of their colleagues concerning a particular stock. It is important that investors should verify this information from appropriate sources such as official websites or official announcements. Also, the fear of Missing out (FOMO) fosters herding among millennials (Tarjanne, 2020). Framing was another factor that had a great impact on investors as investors are unable to comprehend information so the use of fillers to aid decision making. The researcher also supports the study of Diacon and Hasseldine (2007) that investors prefer to use pictorial images rather than information in words to make decision. This acts as a coping mechanism for the investor. Overconfidence, Gambler's Fallacy and representativeness (under heuristic) was also an important finding as investors think they can predict their wins and infer it on an upcoming investment due to the information gathered, hence they dabble in to high-risk investment. It was also observed that an underlying factor overconfidence despite having a low impact serves as a building block for this other factors. Illusion of control and Optimism are also linked. When an investor is overly optimistic about their investment portfolio, it gives them the illusion they are in control of their investment as they are not watchful that the financial market is a volatile place. Riaz and Iqbal (2015) explain that these factors doesn't do the investor any good

Also, the correlation between experience, education and behavioral factors allowed to see which of the individual behavioral factors had strong ties to the millennial's investors. Overconfidence, gambler's fallacy, optimism, illusion of control and past trend of stock stood out as it had the most impact. This explains that these same sets are rampant with millennial investors in Nigeria. Overconfidence was particularly seen as the number one underlying factor that boosts the presence of the other factors mentioned. As previously mentioned, millennials are narcissists, which fosters overconfidence to a very great level. the key findings showed that the less experience they have, these factors tend to have great impact on their investment decision. The fact they have attained a great level of educational status could also foster the presence of this factors too. While other studies such as Dispa (2020) explained that investors with more experience are not easily influenced by these behavioral biases. These behavioral factors mentioned can also bring awareness to the investor.

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APPENDIX I – Questionnaire

Appendix I contains the questionnaire that was shared to participants online. Also, a table is drawn to show the questions associated with each as well as the sources.

Section 1

Section 1 gives important information regarding this present study. Please carefully read it before completing the questionnaire.

Author of the questionnaire:

My name is Atinuke Bogunjoko and I am currently an MSc. Finance student at the National College of Ireland. This study is for the partial fulfilment of my thesis study.

Purpose of the study:

The purpose of this survey is to assess the impact of behavioural finance in Investment decision – An investigation in to how psychological factors affect investment decisions among millennial investors in Nigeria. The analysis of this questionnaire would be used solely for the completion of my thesis. All information gotten for this study would be gathered anonymously and deemed confidential and would not be traced back to the candidate filling this questionnaire.

The completion of this questionnaire is voluntary. If you want to withdraw from the study, please shut your browser window. Upon withdrawal, the questions you have already answered will not be recorded. However, should you decide to complete this questionnaire, all responses will be kept anonymous and confidential and will be stored in a secure, password-protected file.

This questionnaire would consist of 28 closed – ended questions and would take nothing more than 5 minutes to complete.

For any question, kindly contact me via e-mail: x19221584@student.ncirl.ie

Thank you in advance for completing this questionnaire.

Question 1. Do you agree to take part in this study?

- Yes
- No

Question 2. What's your Nationality?

- Nigerian
- others

Section 2

This research studies the behaviours of investors who invest in the stock market

Question 3. Do you invest in the stock market?

- Yes
- No

Section 3

In this section we are interested in you and your background to better inform our analysis of your investment decisions.

Question 4. What is your age group?

- 18 - 27
- 28 - 37
- 38 - 47
- 48 - 60
- Over 60

Question 5. What is your gender?

- Male
- Female
- Transgender
- Prefer not to respond
- Other (please specify)

Question 6. What is your marital status?

- Single (and never married)
- Living with a partner as if married
- Married
- Separated
- Divorced
- Widowed
- Other (please specify)

Question 7. What is your education level?

- Primary education
- Secondary education
- Third level education
- Masters level education
- PhD or doctorate
- Other (please specify)

Question 8. How long have you been investing in the stock market?

- Less than a year
- 1 year to 4 years
- 5 years to 9 years
- 10 years and above

Question 9. What type of investor are you?

A retail/individual investor is a person who trades securities for their own personal account rather than for an organization. An institutional investor is a person or organization who trades securities on behalf of other people (i.e: pension funds, mutual funds, money managers, etc...).

- Retail/Individual
- Institutional/professional

Section 4

The purpose of this section is to find out about how psychological factors impacts your investment decisions. Please indicate the extent to which you agree with the following (1 = Strongly disagree, 5 = Strongly agree)

Question 10. You believe that your skills and knowledge of the stock market can help you to outperform the market

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 11. You feel you are experienced enough to forecast the winning investments

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 12. You rely on past performance to buy stocks because you believe that the good performance will continue

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 13. You prefer to invest in large stocks from leading companies

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 14. You avoid investing in stocks that have recently risen in price over a series of subsequent trading sessions because you believe the trend is more likely to reverse.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 15. You believe that investing in high-risk investment gives you a greater chance of making a gain

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 16. You prefer to make investment decisions using pictorial appearances rather than just a piece of information in words.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 17. After a prior loss, you become more risk averse

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 18. You tend to treat each element of your investment portfolio separately

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 19. I ignore the connection between different investment possibilities

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 20. You avoid selling shares that have decreased in value and readily sell shares that have increased in value.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 21. You are very optimistic about the diversification of your investment portfolio.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 22. You believe your investment would promise high capital gain

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 23. You believe your eye for good investment gives you control on the outcomes

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 24. You do react quickly to new information in the market

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 25. You put the past trends of stocks under your consideration for your investment.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 26. Other investors' decisions of the stock volume have impact on your investment decisions

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 27. Other investors' decisions of buying and selling stocks have impact on your investment decisions

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 28. You usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Question 29. You would be inclined to follow investment advice or ideas received during a face-to-face conversation from a friend or colleague.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Themes of investment behaviours - Questions and sources

Themes	Psychological Factors	Question	Source
Heuristic	Overconfidence	10. You believe that your skills and knowledge of stock market can help you to outperform the market.	Ngoc (2014)
	Overconfidence	11. You feel you are experienced enough to forecast the winning investments.	Mumaraki and Nasieku (2016)
	Representativeness	12. You rely on past performance to buy stocks because you believe that the good performance will continue.	Aymeric Dispa (2020)
	Representativeness	13. You prefer to invest in large stocks from leading companies.	Author
	Gambler's fallacy	14. You avoid investing in stocks that have recently risen in price over a series of subsequent trading sessions because you believe the trend is more likely to reverse.	Aymeric Dispa (2020)
	Gambler's fallacy	15. You believe that investing in high-risk investment gives you a greater chance of making a gain.	Author
Prospect	Framing	16. You prefer to make investment decisions using pictorial appearances rather than just a piece of information in words.	Author
	Loss aversion	17. After a prior loss, you become more risk averse.	Ngoc (2014)
	Mental accounting	18. You tend to treat each element of your investment portfolio separately.	Ngoc (2014)
	Mental accounting	19. I ignore the connection between different investment possibilities	Kimani (2011)
Emotions	Regret Aversion	20. You avoid selling shares that have decreased in value and readily sell shares that have increased in value.	Ngoc (2014)
	Illusion of Control Bias	21. You believe your eye for good investment gives you control on the outcomes.	Author
	Optimistic Bias	22. You believe your investment would promise high capital gain.	Mahina, Muturi, and Memba,
	Optimistic Bias	23. You are very optimistic about the diversification of your investment portfolio	Author
Market Impact	Past trend of stock	24. You consider carefully the price changes of stocks that you intend to invest in	Ngoc (2014)
	Overreaction	25. You do react quickly to new information in the market.	Aymeric Dispa (2020)

Herding	Herding	26. Other investors' decisions of the stock volume have impact on your investment decisions.	Ngoc (2014)
		27. Other investors' decisions of buying and selling stocks have impact on your investment decisions.	Ngoc (2014)
		28. You usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market.	Ngoc (2014)
		29. You would be inclined to follow investment advice or ideas received during a face-to-face conversation from a friend or colleague.	Aymeric Dispa (2020)

APPENDIX II – Cronbach Alpha for Reliability Test

Table 13: Cronbach Alpha for behavioral factors displayed in millennial investors

	Cronbach's Alpha if Item Deleted
Overconfidence	0.639
Overconfidence	0.630
Representativeness	0.635
Representativeness	0.632
Gambler's Fallacy	0.672
Gambler's Fallacy	0.622
Framing	0.619
Loss Aversion	0.685
Mental Accounting	0.628
Mental Accounting	0.646
Regret Aversion	0.627
Illusion of Control	0.605
Optimism	0.611
Optimism	0.592
Past Trend of Stock	0.639
Overreaction	0.627
Herding	0.612
Herding	0.633
Herding	0.628
Herding	0.655

Appendix III – Factor Analysis

Table 14: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.493	17.463	17.463	3.493	17.463	17.463	3.060
2	2.491	12.455	29.918	2.491	12.455	29.918	2.058
3	2.036	10.178	40.096	2.036	10.178	40.096	1.982
4	1.443	7.217	47.313	1.443	7.217	47.313	2.043
5	1.402	7.008	54.320	1.402	7.008	54.320	1.744
6	1.237	6.183	60.503	1.237	6.183	60.503	1.677
7	**1.149**	**5.743**	**66.246**	**1.149**	**5.743**	**66.246**	**1.705**
8	0.933	4.667	70.913				
9	0.784	3.920	74.833				
10	0.766	3.829	78.662				
11	0.760	3.801	82.463				
12	0.596	2.982	85.445				
13	0.483	2.414	87.859				
14	0.471	2.356	90.215				
15	0.449	2.246	92.461				
16	0.394	1.969	94.430				
17	0.366	1.830	96.260				
18	0.292	1.462	97.721				
19	0.263	1.315	99.037				
20	0.193	0.963	100.000				