

## COGNITIVE AND EMOTIONAL BEHAVIOURAL FINANCE FACTORS AND INVESTORS' INVESTMENT DECISION MAKING: EVIDENCE FROM THE NIGERIAN CAPITAL MARKET

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### Abstract

*This study investigated cognitive and emotional behavioural finance biases and investors' investment decision making in the Nigerian capital market. The cognitive behavioural finance biases examined were overconfidence bias and self-attribution bias; while the emotional behavioural finance bias were illusion of control bias and regret bias. The study used the survey-descriptive research design while four-point scale likert-type questionnaire was employed as the research instrument to elicit responses from one hundred respondents selected using the simple random sampling method. The data was analyzed using the ordinary least squares (OLS) multiple regression method. Findings from the research showed a positive and significant effect of overconfidence bias, self-attribution bias, illusion of control bias and regret bias on the investors' investment decision making in the Nigerian bourse. Illusion of control demonstrated little effect on investment decision making compared to other biases examined. The study concluded that both cognitive and emotional behavioural finance biases are key drivers of investors' investment decision making in the Nigerian stock market. The study therefore recommends that investors should frequently form a proper pattern of judging and observing the behaviour of others while decisions are being made.*

**Keywords: Overconfidence bias, Self-attribution bias, Illusion of Control bias, Regret bias, Investors' Decision Making.**

### 1.0 Introduction

All over the world, investment decision making is done in millions every minute by investors (Kimeu, 2016). Investors for many years depends on modern financial theories and models such as capital structure (Modigliani & Miller, 1958); capital asset pricing model (Sharpe, 1964; Lintner, 1965, and Mossin, 1966); efficient market hypothesis (Fama, 1970); options pricing model (Black & Scholes, 1973) and expert opinions in making investment

decisions to maximize returns either in the short term or long term. These financial theories and models assist investors to be rational (preferring lower risk and higher gains) in the financial market. By rational, it means that investors are self- interested, fully informed and they make all the decisions regarding risk and gain from a proposed investment in order maximize their wealth in the financial market (Manazi, Noreen, Asif & Aziz 2016). This is what plays out in the traditional finance. But over time, it has come to be real that rather than investors being rational, they are irrational, they act on the basis of emotion, psychology, thinking and experience to undertake an investment in the financial market.

Financial market is often very volatile and highly uncertain. The unpredictability and uncertainty in the market can cause high fluctuation in the investments. This is one of the reasons that most of the time, investors do not receive the desired outcomes because of variability in investment returns (Yüksel & Temizel, 2020; Evbayiro-Osagie & Chikuka, 2021). The obvious reason behind this swing is the fallibility of financial measuring models, standards and theories (Zahera & Bansal, 2018). Investors rely on several financial models to create rationality in their investment decisions making in the stock market. However, those financial models often are unable to provide the certainty (rationality) of correct decision making that leads to profit maximization for investors in the stock market. Also, those theories and models of finance do cause participants in the market to frequently hold the notion that stock prices should fully reflect all available information. Since the key purpose of investors is to maximize their profits amidst uncertainty, rationality stands to lose its potency in the market.

This then gives rise to the notion of non -rationality of economic agents (investors) in the field of behavioural finance. Behavioral finance depends on the psychological decision of the investors. This is so because human beings are sometime biased both intentionally and unintentionally in their routine life decisions. Psychology is an art which study the human behaviour, nature and attitude and how human deviates from rational decision (Bashir, Javed, Ali, Meer & Naseem, 2013). Thus, the tenet of behavioural finance is that rather than depending on financial theories and models to drive investors' rationality, investment decision making is largely driven by psychology, emotion and biases in the market. It is in consonance with this view that Fischer and Gerhardt (2007) identify some cognitive, emotional and psychological factors such as fear; love; greed; optimism; herd instinct; the tendency to focus on recent experience; and the tendency to overestimate oneself. This implies that emotions and psychology have some immense implications on investment decision-making and most investors do loss money as a result of behavioural influences or biases (Chin, 2012).

Kahneman and Tversky (1979) had earlier supported this claim that investment decisions are based on cognitive, emotional and psychological underpinnings, and this their led to the resurgence of behavioural finance in recent times to complement the modern finance theories (Jaiyeoba & Haron 2016). A positive mood can result in a better and appreciable gain on investment. Hence, Kengatharan (2014) argued that investors do not behave rationally because cognitive and emotional biases or factors could influence their investment decisions in the market. Human beings are known to make decisions based on their intuitions and feeling rather than collecting sufficient information which will facilitate effective decision

making. Researchers have shown that investors make irrational investment decisions (Chhapra, Raja & Bai, 2018).

One of the biases investors are prone to exhibit in the market is the regret bias. Regret bias is also referred to loss aversion. It occurs when an individual investor regrets about the past loss of investment (Chin, 2012; Shefrin, 2002). In Nigeria, for instance, when the prices of shares of listed firms crashed in the stock market sometimes ago, most investors affected, regretted such phenomena disaster. Majority of them vowed to avoid investment in stocks of listed firms and resort to engaging in alternative investments channels with minimal risk and high expected returns. Regret aversion often result in indecision and failure on the part of the investor to exercise caution on an investment due to the fear of the unfavourable outcome of the past investments. This regret bias restricts investors to take necessary action due to the regret of a previous failure (Chin, 2012; Shefrin, 2002).

This connotes that individuals who suffered losses on their investment might become conservative to minimize the pain associated with additional losses. Regret aversion may be linked with risk aversion since people occasionally may fear not buying the right financial assets or buying the wrong assets. Investors may want to do away with emotional trauma associated with making bad decisions. Regret averse investors may strategically adopt a habit of investing in short- term bonds to mitigate the volatility of the stock market (Chin, 2012). Regret adverse investors may also monitor the price of the stocks already sold and tend to regret if the price changed upwards after the sale (Raheja & Dhiman (2017).

Closely connected with regret bias that investors are susceptible to are overconfidence bias, regret bias, illusion control bias, self-attribution bias, representative bias, availability bias, snake bite bias and among others. Overconfidence bias is one of many instances of the cognitive errors affecting investor decision making. Overconfidence is one of the most studied behavioural biases (D'Acunto, 2015). Miller and Ross (1975) states that overconfident people easily attribute their success to their own ability, and attribute their failures to external factors (market anomalies) and actual sense, investors in financial markets are no exception to this. According to excessive trading hypothesis the investor with high overconfidence makes excessive trading as he is overconfident on his knowledge, abilities and information and he thinks that his decision will give him positive outcome ignoring the downside risk of his investment (Manazi et al. 2016).

Overconfidence bias manifests in three forms, namely: miscalibration, underestimation of volatility and the "above average" effect (Glaser & Waber (2007). The researchers averred that miscalibration is the difference between the accuracy and the probability assigned in any investment decision making process by investors. For instance, the authors noted that when asked to make a forecast without being precise but estimating within a certain confidence interval, people usually are less accurate. Underestimation of volatility overconfidence bias occurs when for instance investors are asked to each provide confidence intervals for the return or price of a stock in the future. There is the tendency that those investors may provide intervals that are too tight and deviate from the possibilities of a correct guesses. In this case, they may be regarded to have underestimated historical volatilities.

The belief that one is better than the average person is termed as the “above average” overconfidence bias. When majority of stock market traders think their investment skills are above average, which leads them to trade more than other investors, “above average” overconfidence bias is said to occur. Similarly, investors who attribute past success to their skill and past failure to bad luck are likely to be demonstrating above average overconfident bias in the stock market. An investor who is overconfident will want to utilize his perceived superior ability to obtain large returns.

Most importantly, overconfidence bias may influence investors if they feel they have enough knowledge and experience to evaluate new investments in the market (Alsabban, & Alarfaj, 2020). Overconfidence bias is an excessive belief in investors’ judgements and abilities based on experience and information available to them. Based on the information they are privy to, investors tend to believe that they know more of a particular investment channel in the market than other investors. Overconfidence makes investors too confident about investment decision. Hence, De Bondt and Thaler (1995) see overconfidence as the overestimation by investors on success rate based on their skills and knowledge of an investment (Chaudhary, 2013; Shiller, 1998). Over confidence bias is always one of the driving forces in hubris hypothesis in mergers and acquisition scheme. In mergers and acquisition scheme, the corporate managers in a predator (target) firm do hold the belief that they will make huge success after they successfully merge or acquired an acquiree firm. However, there have been several instances of firms which failed after the mergers, acquisition or take over scheme in the corporate world.

Thus, through overconfidence bias mentality, investors are prone to self -deceived to overestimate their abilities and knowledge by ignoring the possible negative outcome of an investment and tend to trust their talents to surmount hurdles, and this often exposes them to risks (Johnsson et al., 2002). That means an investor is more likely to face higher risk if that investor has overconfidence within himself/herself. March (1987) elaborated on this idea by stating that overestimation about success rate is done when investors consider themselves as experts. Moreover, overconfidence is one of the reasons investors prefer those companies that are less diversified.

Overconfidence bias has a significant favourable influence on investment decisions (Subash, 2012). It shows that investors associate higher returns on investment due to overconfidence, previous knowledge and capacity, and blame lower returns on lousy luck (Qadri & Shabbir, 2014). According to Agrawal (2012), overconfidence is among the most essential and useful behavioural biases that have many hostile consequences for investors such as lower expected utility, a higher tendency of leaving the market, excessive transactions, and lower returns on investment. Subrahmanyam (2008) confirm that, in general, overconfidence is harmful to individual investors. For instance, Eichholtz and Yonder (2011) found out that overconfidence in investment decisions negatively affect firms’ performance.

Pompian (2006) concluded that overconfidence behavior causes an investor to ignore or underestimate the risk associated with his investment in the stock market. In stock market for example, the prices are affected by the news because prices incorporate the news and information about upcoming event. Stock prices decreases due to bad news and increases in

response of positive information. But the overconfident investors don't respond to the bad news. He takes the bad news for granted and ignore the risk of decline in prices. He believes that his trading activity will not be affected by the bad news due to his overconfidence caused by his optimistic behavior, confirmation bias, self-attribution bias and illusion of control. The overconfidence bias creates an assumption that someone is better because of over-reliance in self-skills and assigning less weightage to other information; thus, it has a negative effect on decisions (Fashim, Ali, Khan & Khan, 2019).

Therefore, closely connected with overconfidence bias is optimistic behaviour bias, confirmation bias and illusion of control bias. Chief among these bias driving overconfidence are illusion of control bias and self-attribution bias. In illusion of control bias investor has unwarranted or intoxicated faith in his abilities to have control on the investment and he thinks that he will not suffer losses from the investment. Also he has wrong belief about his knowledge that he has excessive or great knowledge as compare to the other investors, and he ends up suffering from the consequences of illusion of knowledge bias. Again, self-attribution bias makes investor overconfident as he does not go to deeply assess the reason and technique of success but he considers and attributes the reason or chances of success occurrence to his own unwarranted beliefs and again tries to apply these beliefs in some other situations but fails to get the fruitful results as those factors are not the true predictors of the situations which he considered.

Thus far, it can be deduced from the development of literature that many behavioral biases are overlapping or extension of other behavioral biases. From the sequence of the biases discussed above, it is easy to note that one bias leads to the other. In the stock market comprising of buyers of stocks, overconfident investors may be overtaken by illusion of control bias, self-attribution bias and suffer the grave consequence of regret bias in their investment decision making in the market. This study therefore considers overconfidence bias, illusion of control bias, self-attribution bias and regret bias which are frequently observed in financial markets. The intention of this study is to find out how overconfidence bias, illusion of control bias, self-attribution bias and regret bias drive investors' investment decision making in the stock market of Nigeria.

In Nigeria, apart from the research of Babajide and Adetiloye (2012); Evbayiro-Osagie and Chijuka (2021), the amount of research work done on this topic is less to the best of the researcher's knowledge. Therefore, to address this issue, there is a need to fill this gap by employing some behavioural biases to understand the behaviour of an investor in relation to investment decisions in the Nigerian Stock Exchange. Prior studies have investigated the association between the behavioral finance factors and investment decision on the empirical fronts but mixed findings (see, Pompian, 2006; Bashir et al. 2011; Bakar & Amelia, 2016; Manazi et al. 2016; Wamen, 2017; Evbayiro-Osagie & Chijuka (2021).

For example, Qadri and Shabbiri (2014); Bakar and Amelia (2016); Ramiah et al. (2016), Manazi et al. (2018), Fashim, et al. (2019); Nkukpornu et al. (2020), Evbayiro-Osage and Chijuka (2021) ascertained a positive nexus between overconfidence bias and investment decision. While Kafaat (2014); Irwan, Trimugroho and Roysenbel (2011) obtained a relationship between overconfidence bias and investment decision making in the stock market. While the research

of Riaz and Iqbal (2015); and Nkukpornu et al. (2020) obtained a positive link between self-attribution bias, illusion control bias, and regret bias and investors' investment decision making, Ullah, Elahi, Ullah, Pingu and Subhani (2020) found a negative link between these biases and investment decision making by investors.

Although, self-attribution bias is now gaining attention in the domain of individual financial decisions but extant literature lacks sufficient studies which empirically tested this construct (Hoffmann & Post, 2014). However, few empirical evidences confirmed the presence and association of self-attribution bias with investor decisions (Feng & Seasholes, 2005). This constitutes a research gap in literature. Moreover, this study takes a departure from the research of Babajide and Adetiloye (2012); Evbayiro-Osagie and Chijuka (2021); Nkukpornu, Gyimah and Sakyiwaa (2020) which investigated behavioral factors like overconfidence, availability bias, conservatism and herding behavior of investors in the Nigerian Stock Exchange (NSE) and Ghana stock market respectively, but failed to examine the effect of self-attribution bias, illusion control bias, and regret bias on investors' investment decision making. It is against this backdrop, that this research is undertaken.

## **2.0 Literature Review**

### **2.1 Conceptual Review**

#### **Behavioral Finance**

Behavioural finance as a science originates in 1985 when two articles that were published in the "Journal of Finance" (De Bondt & Thaler, 1985). Thaler (1999) stated that behavioural finance is an integration of classical economics and financial theories within studies investigating psychology and decision making. However, on the other hand, Shefrin (2001) interpreted behavioural finance as the study of psychology to understand financial behaviours. Precisely, behavioural finance can be defined as the study about the investment that is dependent on the emotions and feelings of investors rather than on practical and rational approach.

#### **Overconfidence Bias**

Overconfidence is bias that affects the decision of individual as well as corporate world. People have a propensity to overestimating their abilities and avoid taking the help of others in decision making process. These people totally rely on their abilities and they search less help and direction during the decision making process. Busenitz and Barney (1997) defined overconfidence as a tendency to overestimate the probability of being right. Zacharakis and Shepherd (2001) expressed overconfidence as a propensity to overvalue the probable occurrence of any set of events. Further, they stated that people naturally tend to recall past successes more than their failures, which may give rise to overconfidence as well as increasing the chances of repeating similar investment mistakes.

#### **Illusion Control Bias**

Illusion of control is being stated by Shefrin (2007) as "believe of people of controlling and influencing the outcomes but in reality it's not being done the way people think and do not influence at all". Confirmation bias in regard to decision making of individual and corporate, in present era, ideas of others is being fully ignored but focusing on their own. Impression is being influenced by the personal involvement rather reality opposes this phenomenon. More

it can be said that illusion of control, accentuating of predispositions towards error are being connected with people's overconfidence

### **Self-Attribution Bias**

It is also referred to as self-serving bias describes when an investor attributes positive events and successes to our own character or action. Victim of self-attribution bias takes credit of good performance and blame external factors if portfolio returns are not satisfactory (Mushinada&Veluri, 2018), but blame negative results to external factors unrelated to our character. Self-attribution bias is very important concept in the domain of psychology and it refers to a person likelihood to take credit of successes and attribute failures to those factor which are beyond one's control.

### **Regret Bias**

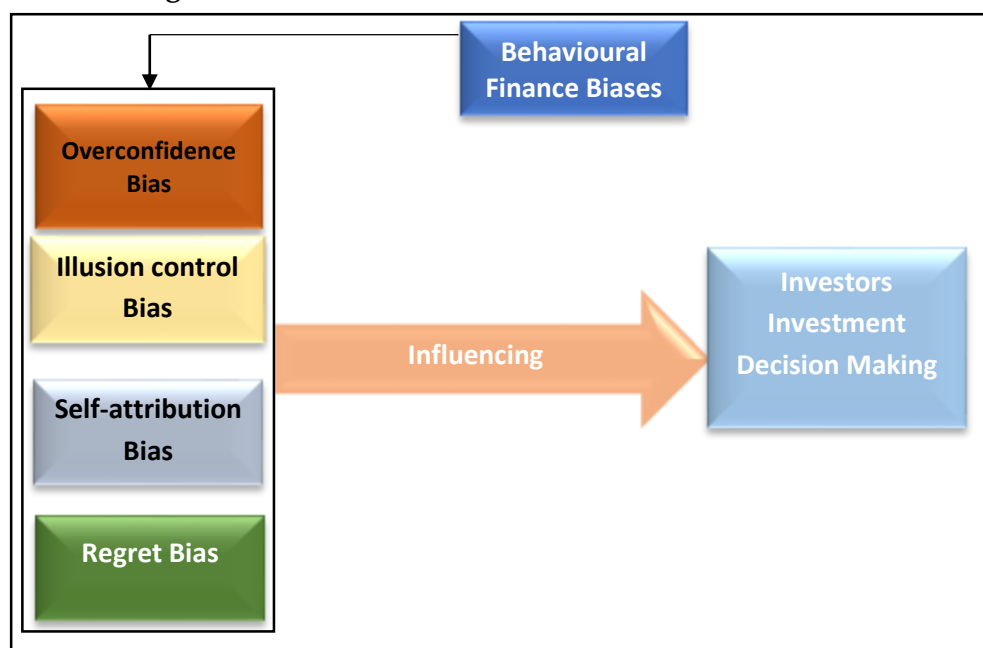
The regret aversion or bias is one of the behavioral finance biases in literature. The regret bias holds the view that investors tend to avoid regret that will affect them in the future. Regret bias emanates from the regret theory. The regret theory holds the view that many people experience the sensations known as regret and rejoicing; and second that in making decisions under uncertainty, they try to anticipate and take account of those sensations. In other words, regret theory assumes that agents are rational but base their decision not only on expected payoffs but also on expected regret (Pompian, 2006).

Generally, the term regret is used to describe the sense of sorrow or disappointment over something done or not done (Landman, 1987). Sorrow may result from both the comparison of the actual outcome with the alternative outcome and from the feeling of responsibility or self-blame for the disappointing outcome. According to Bell (1982) and Loomes&Sugden (1982) regret seems most relevant emotion in the context of decision making. Other emotions are relevant for decision-making as well, such as worry, fear, happiness, and elation. However, these emotions may also occur in absence of a decision, since they are related to aspects of outcomes or to uncertainty.

Regret is directly linked to the choice or decision at hand (Zeelenberg& Pieters, 2004). Regret aversion is the term used to describe the emotion of regret experienced after making a choice that either turns out to be a bad choice or at least an inferior. People exhibiting regret aversion avoid taking decisive actions because they fear that, in hindsight, whatever course they select will prove less than optimal. Regret aversion also makes people unduly apprehensive about breaking into financial markets that have recently generated losses (Pompian, 2006).

## Conceptual Framework

**Figure 1: Relationship between Behavioural finance biases and Investors' Investment Decision Making**



**Source: Researchers' Conceptual Framework Design, 2022**

The conceptual framework aptly explains how the selected behavioural finance biases, viz-a-viz, overconfidence bias, illusion of control bias, self-attribution bias and regret bias as cognitive and emotional biases influence investors' investment decision making in the financial market. The cognitive behavioural finance biases are the overconfidence bias and self-attribution bias while emotional behavioural finance biases are the illusion of control bias and regret bias respectively.

## Theoretical Framework

This study is hinged on the prospect theory and the cumulative prospect theory respectively. The prospect theory was first advanced by Markowitz (1952) under mean- variance approach to determining assets final outcome in the financial market. The theory was later popularized by Kahneman and Tversky (1979) where they explained that people value gains and losses differently. According to the prospect theory, people often base their decisions on perceived gains instead on perceived losses. Gains matter a lot to rational investors compared to losses they may suffer from an investment final outcome (Osamwonyi& Kasimu, 2017). The theory also implies that people evaluate these losses and gains using certain past experiences. Though the prospect theory managed to explain some major violation of the expected utility theory which relates to small number of outcomes, its weakness is that it clearly violates the first order stochastic dominance (Ogbeide &Okpamen, 2020). Similarly, it was incompatible with large number of outcomes. Also the prospect theory was unable to explain the source of uncertainty peculiar to individual decision making.



As a way of ensuring that the noticeable lacuna in prospect theory was addressed, Tversky and Kahneman in 1992 developed the cumulative prospect theory (CPT). Two central assumptions in CPT are that individuals are risk-averse over gains and risk-seeking over losses. They opine that rational agents tend to overweight low probability events while underweighting the likelihood of high-probability ones. Cumulative prospect theory (CPT) is based on the earlier version of prospect theory where it still characterizes decision makers deciding on the basis of the value function exhibiting loss aversion, diminishing sensitivity, and the probability distortion function. The stands of the cumulative prospect theory (CPT) of Tversky and Kahneman of 1992 on one hand lie squarely on loss aversion. Generally, individual investors are both risk seekers and risk averters at the same time and this is frequently observed in their investment behavior (Ogbeide & Okpamen, 2020).

Hasbauch, Krause and Vesterlund (2007) were intellectually triggered to examine the robustness fourfold pattern of risk attitudes under two elicitation procedures. According to them, individuals are on average, risk-seeking over low-probability gains and high-probability losses and risk-averse over high-probability gains and low-probability losses with regard to prices for the gambles. Hasbauch, Krause and Vesterlund (2009) inquisitive assessment of the fourfold pattern is a very good predictor of risk attitudes but it appears to work only or better when people are asked to report their willingness to pay for a risky prospect. When they are instead asked to choose between two gambles (lotteries) and given expected value, it is often obvious that their decisions are not distinguishable from random choice.

### **Empirical Review**

Evbayiro-Osagie and Chijuka (2021) examined behavioral factors and investment decision making in the Nigerian Stock Exchange (NSE). A structured questionnaire was used to collect data from 75 investors with the application of a convenient sampling method. They used overconfidence bias, availability bias, conservatism, and herding effect to define the most important behavioural element affecting investment decision making by investors in the Nigerian. Multiple regression analysis was used as the key methodological method for evaluating the research hypothesis. The findings of this study indicate that overconfidence, availability bias, and herding demonstrated a positive significant relationship with NSE investment decision-making except conservatism which showed a negative relationship with investment decision-making.

Nkukpornu et al (2020) examined the nexus between behavioural bias and investment decisions in a developing country context. Specifically, this study tests the effect of four behavioural biases (overconfidence, regret, belief, and —snakebite) on investment decisions. Descriptive statistics and inferential statistics including multiple regression were used to examine the behavioural biases-investment decisions nexus. The study reveals that the four bias have a significant positive and robust relationship with investment decision making. The result also shows that the "snakebite" effect contributes more to the decision making, followed by belief bias then regret bias. Overconfidence bias, however, contributes the least effect on investment decisions.

Manazi et al. (2018) examined the impact of overconfidence bias on investment decision in Pakistan. Data for the research was collected from lecturers, the students of finance and investment bankers. Independent samples t-test was used for the analysis and testing the hypothesis. Results of the study shows that high overconfident investors make aggressive and excessive trading as compare to low overconfidence investors in the stock market of Pakistan. Ramiah et al (2016) found out that overconfidence bias influences investment decisions. Qadri and Shabbir (2014), in their study, found out that overconfidence bias and "illusion of control" have a significant favourable influence on investment decisions. Kafayat (2014) found out that overconfidence, over-optimism, and self-attribution influence decision are negatively correlated with investment decisions.

Luu (2013) came up with the findings of the impact of BF on Vietnam and concluded that there is a moderate impact of BF on the stock market. The study used five factors for the study which include overconfidence, herding, prospect, anchoring, and market. The findings of the research show that there is a moderate impact of these factors on the market. Which means investor's behaviour is affected but in moderation.

Birau (2012) presented his study about capital market investment and decision making. He argued that the decisions are affected by the psychological factors that are part of behavioural finance as well. Moreover, he indicated that classical finance theories for the evaluation of investments are not enough for investment decision making. Instead, they are affected by other psychological factors, such as herding, disposition. Risk-averse etc. the findings of the study concluded that the classical models to gauge the rational decisions are not enough. Other factors may influence investment decision making. This proves that behavioural finance has become most important in the field of research because of its significant impact on decision making.

IrwanTrinugroho and Roy Sembel (2011) conducted the study to check the excessive trading behavior due to overconfidence. The objective of their study was to check excessive trading hypotheses; the investors having higher confidence show excessive and aggressive trading behavior. The results of the study confirm the excessive trading hypothesis that higher overconfidence investors tend to high trading activity as compared to less overconfidence investors.

Kliger (2010) focused on an essential factor availability bias that is usually an impactful cause of irrational decision making. He analyzed the availability on the bases of risk and dub outcome. The study discovered that when there are positive changes in the stock price, the decision is more irrational because the available information is the base for next decision making.

Seppälä (2009) conducted the study to rule out the impact of three psychological biases that may hinder the investment decision-making advisors. The study incorporated the most critical factor overconfidence, the most debatable factor hindsight, and most research factor self-attribution. The study found out that advisors of investment are affected by the hindsight factor. Moreover, those investors who are experienced are more likely to be affected by self-

attribution factor. Finally, most experienced investors are more confident about their decisions.

Chira (2008) examined the elements dealing with the individual behaviour of an investor and their impact on investment decision making. This study was conducted on the business students, and data was collected with the help of a questionnaire. The significant variables for the analyses were loss aversion, overconfidence, and sunk cost. This study was limited to the students only; therefore, results may not be authentic.

### 3.0 Methodology

The study used the survey-descriptive research design while four-point scale likert-type questionnaire was employed as the research instrument to elicit responses from one hundred respondents selected using the simple random sampling method. The use of questionnaire as a basis of collecting data for analysis in this study is premised on the fact that researches involving behavioural finance often rely on primary data, unlike the traditional finance that depend on secondary data for research and modeling (See, Bakar & Yi, 2016; Chin, 2012; Prosad et al., 2015; Subash, 2012). The use of surveys is convenient and avoids researcher bias (Bell & Bryman, 2007; Gyimah & Boachie, 2018; Gyimah et al., 2019, 2020). The respondents in the study mainly consisted of lecturers, professional stock and non- professional investors who often buy stocks of listed firms in the Nigerian stock market. Prior to administering the structure questionnaire, it was validated and tested for reliability to ensure internal consistency using Cronbach’s alpha. The result from the Cronbach’s alpha gives 0.937value. The reliability test value affirms the internal consistency of the instrument and meet the threshold suggested by Nunally and Bernstein (1994) that argue that Cronbach’s Alpha greater than 0.6 is acceptable. The study used the ordinary least squares (OLS) multiple regression to show the relationship between the independent variables and the dependent variable. The econometric model for the study is presented below.

$$IDM = \alpha + \beta_1 OC_{bias} + \beta_2 IC_{bias} + \beta_3 SA_{bias} + \beta_4 R_{bias} + \varepsilon \dots \dots \dots (1)$$

Where; IDM represents investors’ investment decision making; OC bias represents overconfidence bias; IC bias represents illusion of control bias; SA bias represents self-attribution bias and R bias represents regret bias.  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ , and  $\beta_4$  are the predictors or coefficient of determination.  $\varepsilon$  - is the error term.

### 4.0 Empirical Analysis

This section concerns the analysis of the data collected from the respondents through the structure questionnaire. The data were analyzed using the Pearson correlation matrix and multivariate regression estimation methods. The results from the estimation methods are presented and discussion in each of the tables sequentially as follow:

**Table 2: Regression Output**

**Dependent Variable: IDM**

OC bias	0.142*** [0.001]
IC bias	0.050*** [0.005]
SA bias	7.141 [0.002]
Rbias	1.001*** [0.000]
Constant	2.330***
R-Square	0.768
Adjusted R-square	0.712
F-statistics	4.576
Prob. Value	0.000
Durbin-Watson Stat.	1.987

Table 2 represents the variables in the model. Probability values are in parenthesis at different significance level with  $**p < 0.1$  and  $***p < 0.01$ . The result of the multivariate regression analysis in table 2 indicates that the adjusted R-square is about 0.712, representing about 71.2% systematic variation in the independent variable, leaving about 28.8% unexplained due to the error term in the model. The F-statistics value of 4.576 with a probability value of 0.000 is statistically significant at 95% level. The result connotes that all the behavioural finance biases employed in this study contribute towards driving the investors' investment decision making in the stock market. The finding is in tandem with the research outcome of Evbayiro-Osagie and Chijuka (2021); and Nkukpornu et al (2020). The Durbin-Watson statistics value of 1.987 can be approximately 2.00, and it implies the absence of serial autocorrelation effect in the result. It further suggests that the empirical result is adequate for policy prescription and decision making by investors. Overconfidence bias has a significant favourable influence on investment decisions. It shows that investors associate higher returns on investment due to overconfidence, previous knowledge and capacity, and blame lower returns on lousy luck. The finding is in tandem with Subash (2012); Qadri and Shabbir (2014); Ramiah et al (2016); Manazi et al. (2018); Alsabban and Alarfaj (2020). Most importantly, overconfidence bias may influence investors if they feel they have enough knowledge and experience to evaluate new investments in the market and thereby profit from it.

Illusion of control bias is observed to have a positive coefficient value (0.050) and is statistically significant at 95% level on investors' investment decision making in the financial market. The small coefficient value of illusion of control suggests that illusion of control has little effect when it comes to investors' investment decision making in the Nigerian stock market. The finding connotes that the respondents who are investors have little unwarranted or intoxicated faith in their abilities to have control on the investment in the stock market. This could be due to the volatile nature and unstable environments in the stock market of Nigeria. The finding is in consonance with research output of Riaz and Iqbal (2015) who found that illusion of control and Optimism have significant and positive impact on investment decision

in Pakistan; implying that investors are biased while making investment decision with respect to illusion of control.

Self-attribution bias exerted a positive and significant value of 7.141 on investors' investment decision making. The result portends that those investors who are experienced are more likely to be affected by self-attribution factor. The implication is that most of the respondents have self-confidence in their skills, knowledge in their predictions, and they are optimistic when making decisions. It also means that self-serving bias investor attributes positive events and successes to their own character or action in the course of making investment decision in the stock market. The finding correlates with the research result of Seppälä (2009); Mushinada and Velur(2018).The coefficient value of regret bias reads 1.001 and it is statistically significant at 95% level on investors' investment decision making in the Nigerian stock market. This presupposes that investors who have experienced losses from trading in the securities of listed firms in the Nigerian stock exchange, tend to be regretful and become loss averse. The regret which describes the sense of sorrow or disappointment over losses sustained by investors influences them to be cautious and avoid further risks of being emotionally driven to invest in the stock market. The finding is in line with the research outcome of Pompian (2006); Zeelenberg and Pieter (2004), Birau (2012).

### **Conclusion and Recommendations**

The primary goal of this was to examine how cognitive and emotional behavioural finance biases contribute to investors' investment decision making in the Nigerian Bourse. The cognitive behavioural finance biases investigated were overconfidence bias and self-attribution bias. While the emotional behavioural finance biases investigated were illusion of control and regret biases. Findings from the research showed a positive and significant effect of overconfidence bias, self-attribution bias, illusion of control bias and regret bias on the investors' investment decision making in the Nigerian bourse. In other words, the result from the analysis portrays that both the cognitive behavioural finance biases and emotional behavioural finance biases are key drivers of investors' investment decision making in the Nigerian stock market. Albeit, illusion of control demonstrated little effect on investment decision making compared to other biases examined.

The study therefore recommends that:

1. Investors should frequently form a proper pattern of judging and observing the behaviour of others while decisions are being made.
2. Investors are advised to always recall to mind events and actions that caused them regret in order to avoid repeating similar mistakes. This is so because as they make better decisions, they will not regret it because it is often said that experience is the best teacher.
3. The study recommends that investment decision making, investment information about stocks should be made available by the regulatory authority of the Nigerian Stock Exchange in a form that would be understood by individual investors to help them make sound investment decisions.
4. Rather than being under the illusion (self-deception) control, being overconfident, and self-attributive on expected outcome of a proposed investment, investors are advised

to be open-minded while making investment and desist from holding on to the previous happenings instead must realize that investment in stocks is dynamic.

5. Individual or retail investors should consider many other variables in their environment rather than focusing on just one in making decisions.
6. Investors should learn how to interpret the market and other economic indicators of the various firms in the stock market because they also affect the performance of their stock.

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