Risk Tolerance, Self-Attribution and Investment Decision among Retail Investors in the Stock Market, does Self-Control Matter?

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ABSTRACT

This study examined the moderating effect of self-control on the relationship between risk tolerance, self-attribution and investing decision of individual investors in the stock market using self-control as a moderator. The study employed sample of 388 investors and cross sectional research survey design through questionnaire items adapted from past studies. The study employed Partial least square structural equation modelling through SmartPLS 4.0. The results showed that while risk tolerance and self-control were significant in predicting investing decision, self-attribution was not significant in predicting investment decision. It further revealed that self-control significantly moderate the relationship between risk tolerance and investment decision, self-control does not significantly moderate the relationship between self-attribution and investment decision. In line with the findings, the study concludes that investment decision is affected by risk tolerance and self-control and self-control significantly moderates the relationship between risk tolerance and investment decision. The study therefore recommends that the NSE management, investment advisors, and the capital market authority organise trainings and workshops for the NSE investors and this will boost self-control strengths and raise their investing decision.

Keywords: risk tolerance, self-control, Investment, Decision, Stock Market**,**

1.0   INTRODUCTION

Stock investing is one of the riskiest investment decisions in the global financial markets. By implication, stock investors may be seen as risk lovers whose investment decision is based on the expected risk premium intended to serve as compensation for the risk taken. Investment decisions are very crucial and require hard earned resources. Often

severe losses can be the result of not making the right decisions because investment is related to risk and it is an important element that depicts the investor's decision to invest. This decision if made will be irreversible, risky and have long term implication which no investor would want to be confronted with (Patrick, Tavershima & Eje, 2017 & Su, Liu, Lee, & Quy, 2022). According to Omokehinde, Odutola and Rotimi (2020), empirical evidence discloses recurring forms of irrationality, unpredictability, and ineptitude in the ways investors arrive at decisions and choices when confronted with market uncertainty. Nofsinger (2001) noted that the assumptions of rationality and unbiasedness of individuals had been criticised by psychologists for a long time. Shanmugsundaram and Balakrishnan (2011) asserted that the financial market volatility is constantly fueled by irrational and sub-optimal investment decision making caused by psychological biases and emotions. Thus, the rationality of investors needs to be questioned.

The Nigerian financial market has been no exception to all these inconsistencies. According to Nwude (2012) and Akinkoye and Bankole (2020), through the duration of January 1, 2008 to December 19, 2008, the All-Share-Index (ASI) of the Nigeria stock market fell from an unprecedented high of 66,121.93 during the first week of March to 29,551.84 losing 48.1% in ten (10) months. Also, capitalisation plummeted from 12.6 trillion in the same period to 6.54 trillion, losing 6.06 trillion in ten (10) months. As at December 2010, the ASI recorded an increase of 0.02% and continued a fluctuating trend in the years 2011 to 2017.Though, as at the end of August 2020, the NSE All Share Index had recorded an 18.9% increase from its position at the end of March, 2020 (Nigerian Stock Exchange [NSE], 2020). Furthermore, in 2020, the stock market recorded a significant progress in the equity transaction of 29% from the 21.8% and 24.72% recorded in 2018 and 2019 respectively.

Also, going by the statistics contained in the fact book of Nigerian stock exchange (NSE) of the year 2018, there are over two (2) million individual investors who are involved in investment at the stock market. This is quite small considering the population of Nigeria. The divisional head of trading business at the NSE, Mr Jude Chiemeka, announced that there are over three (3) million individual investors in the market and this represents only 3% of the total adult population in the country which stood at 190 million (Popoola, 2019). This record showed a poor involvement of persons in the stock market. Furthermore, Obamuyi (2013) buttressed the notion that the Nigeria capital market is exposed to influences of pessimistic and optimistic sentimentalities which are created by unpredictable reactions of investors to information. He opined that investor's unpredictable reaction contributed to the crash of Nigeria stock market in 2009.

The decision to invest in the capital market determines the level of funds that can be mobilised in the market. Traditional finance models believe that the stock market players are rational and sensible and that their concern is maximising their wealth. This may not always hold as there are other factors that can affect individual investment decision. Behavioural factors like self-attribution, self-control and risk tolerance may have impact on investment decisions and make investors act in an unexpected, illogical and

unwise manner (Gnawali, 2021; Jain & Kesari, 2020; Kalsum, Sarita, Cahyono, Wawo, 2018; Kartini & Nahda, 2021; Rasheed, Gul & Hashmi, 2021).

Investors are characterised by self-attribution bias as they are known to take credit of good performance and blame external factors if portfolio returns are not satisfactory (Alrabadi, Al-abdallah, & Aljarayesh, 2018; Mushinada & Veluri, 2018). Although it was initially documented that individuals do not learn from their dreadful decisions either because they forget their mistakes or they are ignorant of previously committed errors while making crucial decisions (Nguyen & Schuessler, 2012; Hoffmann & Post, 2014). Subsequently, it was discovered that it is self-attribution bias which refrain investors to learn from their mistakes owing to the misperception that their losses and failures are caused by external factors (Kansal & Singh, 2018).

Further to self-attribution, a factor like risk tolerance also has influence on investment decisions. In any investment decision process, risk is paramount as the amount of risk an investor is willing to take, to some extent, determines the expected return. An individual's willingness to take risks influences the quality and nature of investing decision. Risk tolerance has been found to significantly impact financial decision-making in stock markets (Samsuri, Ismiyanti & Narsa, 2019; Ishfaq et al. 2020) and considered as one of the factors that are usually needed by investors to thrive in stock market (Grable & Roszkowski, 2008).

Also, self-control is considered a crucial factor in forming a person's behaviour (Lown, Kim, Gutter, Hunt, 2015; Elshaer & Sobaih, 2023), because self-control helps improve and focus one's thoughts, attitude and actions regarding achieving a particular goal (Mpaata, Koskei & Saina, 2020). Self-control is the ability to break bad habits, resist temptations and overcome first impulses. Strömbäck *et al.* (2017) found out that self-control predicts sound financial management behaviour. Self-control has been proved to be positively related to financial wellbeing, savings and investment, credit discipline, and retirement planning (Wang & Hesketh, 2012; Biljanovska & Palligkinis, 2015; Achtziger, Huber, Kenning, Raab & Reisch, 2015).

Based on the foregoing, it can be put forth that the relationship between risk tolerance, self-attribution and investment decision is contingent upon self-control level. In other words, self-control may moderate the relationship between risk tolerance, self-attribution and investment decision. Self-control helps the investors to focus on long-term balance toward the future as well as reduces the susceptibility to psychological biases which controls the investment processes through identifying investment objectives, determining specific investment criteria, and ultimately controlling investment environment (Nofsinger, 2017). According to rational finance model, economic decisions by individuals are governed by the principles of perfect self-interest, perfect rationality and perfect information. Behavioural finance strongly challenged these three underlying assumptions. It argues that rationality is not the sole driver of human behaviour since human intellect is actually subservient to human emotions. Therefore, human behaviour is less the product of logic than of subjective impulses such as fear, love, hate, pleasure and

pain. Humans use their intellect only to achieve or to avoid these emotional outcomes (Pompian, 2006). Perfect information is not practically possible since there is an infinite amount to know and learn, and even the most successful investors do not master all disciplines (Kipsaat & Olweny, 2020). This shows that investors are sometimes irrational and make decisions based on psychological factors. Thus, people are either partly rational or irrational in their decisions (Madaan & Singh, 2019). Impliedly, traditional finance theory may be necessary but not sufficient to explain investor's investment decision making process.

Extant studies have provided empirical support for the relationship between these variables, risk tolerance, self-attribution, self-control and investment decision but findings have not been consistent. Self-attribution was reported in the literature to have mixed results; for example, a positive correlation was reported in the works of Gautam et al., (2021), Madaan and Singh (2019) and Mahina et al. (2018) and negative correlation with investing decision was reported by Naveed and Taib (2021). Self-attribution is a phenomenon in which a person disregards the role of luck or external forces in their success and attributes success solely to their strengths and work. Self-attribute is a neutral concept and is used as a descriptor to give information about how a group of securities was chosen. Akbar et al. (2016) concluded that illusion of control and self-attribution favour investor's irrational thinking while greater information availability may lead to more logical, reasoned, and rational behaviour, discouraging irrationality. This can be further interpreted as investor with self-regulation (reasoned before acting, resist biased behaviour) can be refrained from illogical reasoning and encouraged to work base on a planned action. This position is supported by the theory of reasoned action and theory of planned behaviour (Pourmand et al., 2020). The theory of planned behaviour (TPB) links one's beliefs and behaviour. TPB states that perceived behavioural control shapes an individual's behavioural intentions and behaviours. It extends the theory of reasoned action by adding the concept of perceived behavioural control, defined as an individual's perception of the ease or difficulty of performing the particular behaviour (Douglas & Howard, 2015).

Similar findings were recorded in the relationship between risk tolerance and investment decision. Going by the suggestion of Baron and Kenny (1986), where research findings become contradictory, a third variable exists that could explain the inconsistencies. Accordingly, self-control is a factor considered crucial in forming a person's behaviour (Lown, Kim, Gutter, Hunt, 2014 & Elshaer & Sobaih, 2023), because it helps improve and focus one's thoughts, attitude and actions regarding achieving a particular goal (see Mpaata, Koskei & Saina, 2020). Self-control is the ability to break bad habits, resist temptations and overcome first impulses (She et'al., 2021). Strombacket'al (2017) found out that self-control predicts sound financial management behaviour. They further show that the ability to control impulses is undoubtedly a key factor for long-term success in many areas of life. Investors with high self-control tend to employ more positive and less negative strategies than those with low self- control, and the use of these positive strategies can result in a better bet (Li et al., 2016).

Consequently, departure from the very concept of rationality and entry into cognitive domains makes some behavioural characteristics more dominant. Given the importance of making the right investment decision in the stock market as detailed above, this study determines the moderating effect of self-control on the relationship between herding behaviour, overconfidence, self-attribution, risk tolerance and investment decision among individual investors in the Nigerian stock market.

2.0   LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1   Concept of Investment Decision

Investing entails making a current sacrifice in exchange for a future benefit. Individuals, businesses, and governments are all in a position to determine whether or not to invest, as well as how to diversify among the available possibilities. Individual investment behaviour is concerned with decisions about small-scale securities purchases for one's own account (Jagongo & Mutswenje, 2014).

2.2   Concept of Self Attribution

Self-attribution is a cognitive phenomenon by which people tend to attribute success to innate aspects such as talent and foresight, and attribute failures to situational factors. Individuals would take credit for successes and blame external factors for failures (Bradley, 1978). The position of Bradley is in line with the conceptualisation of this variable in this study.

2.3   Concept of Risk Tolerance

Risk tolerance is taken to mean the maximum amount of variability in return that someone is willing to accept when making a financial decision.

2.4   Concept of Self-Control

Financial self-control is another construct recognised by scholars and financial analysts as a predictor of financial behaviour and financial well-being. Self-control is the quality that allows you to stop yourself from doing things you want to do but that might not be in your best interest.

3.0   EMPIRICAL STUDIES

3.1   Risk tolerance and Investment Decision

Empirically, risk tolerance has been found to significantly affect risky decision-making in different financial/investment contexts (e.g., Cardak& Wilkins 2009 &Nguyen, Gallery, & Newton, 2016). Notably, it has been reported that risk tolerant individuals tend to invest less in risk free assets (Hariharan *et'al*. 2000) or risk averse households are more likely to have a lower proportion of their assets allocated in risky assets (Cardak& Wilkins, 2009).

In a relationship between financial literacy, risk tolerance and investment intention, Samsuri, Ismiyanti and Narsa (2019) reviewed many papers and observed that past studies have documented the correlation between financial literacy and a set of behaviours: e.g. saving, wealth, and portfolio choice. They further noted that risk tolerance is a significant factor in a number of household financial decisions. In the context of this study, investors may be interested in investing in a particular company only when they have the time and skill to evaluate the company and have money to invest. The study was carried out by Narsa, who employed risk tolerance as a predicting variable and which is a deviation from the proposition of the model in this study.

Nguyen et al., (2016) examined the influence of risk tolerance with a focus on the key expected risk tolerance determinants: client financial literacy, trust in the financial advice service, and relationship length with the service. Results revealed a positive relationship between client risk tolerance and investment decision-making. A similar finding was reported in the study by Septi et al. (2019) who examined the effect of risk perception, risk tolerance, overconfidence, and loss aversion on investment decision making using sample from workers in Surabaya and Jombang, East Java. The results showed that risk tolerance and overconfidence have a significant and positive effect on investment decision making. Other supporting studies are Kumari and Pandey (2020) and Sadiq (2019).

Kusumaningrum, Isbanah and Paramita(2019) examined the factors that influence investment decisions. This study used financial literacy and investment experience variables as independent variables, risk tolerance as an intervening variable and investment decisions as the dependent variable. The research is a quantitative study using primary data, with questionnaires as data collection technique and novice investors as population in the Economic faculty. Data were analysed using partial least square analysis. Findings also provided support for those of Kumari (2020), Kumari and Pandey (2019) and Septi, Ainia and Lutfi (2019).

3.2   Self-Attribution and Investment Decision

Many researchers argued that people take the credit of positive results or behaviour and let external variables be responsible for any unfavourable outcomes (Miller & Ross, 1975; Bradely, 1976; Larwood & Whittaker, 1977; Clapham & Schwenk, 1991; Clatworthy & Jones, 2003; Aerts, 2005). Although the literature on behavioural finance is extensive, certain empirical instances that are based on psychology seek to explain how behavioural biases and cognitive errors affect the actions of individual investors.

Another study results show that the management takes the credit of good performance of company and deny taking the responsibility of bad performance of company (Keusch, Bollen, & Hassink, 2012). While attributing the factor of success and failure people make self-serving attribution bias (Bradley, 1978; Shepperd, Malone, & Sweeny, 2008). The result of the study conducted by Doukas and Petmezas (2007) shows that managers while making merger and acquisition decisions, make them overconfidence which result in self-serving attribution bias. Investment decisions of managers of

organisation are biased with self-serving attribution biases while they are making decision about acquisition investment and other decisions. Managers overestimate internal factor and underestimate external factor while making investment decision which produces greater return (Libby & Rennekamp, 2012). The study of Krusemark, Keith and Clementz (2008) conducted on 20 participants suggested that people make self-attribution bias while attributing the success and failure factors. Literature available on self-serving attribution bias suggested that individuals while making investment decisions are affected by self-serving attribution bias (Hales, 2007) and people prefer to invest (Chaudhary, 2013).

Hoffmann and Post (2014) conducted a study on self-attribution bias in consumer financial decision- making and how investment returns affect individuals' belief in skill in Netherlands firms. The study found that the higher the returns in a previous period are, the more investors agree with a statement claiming that their recent performance accurately reflected their investment skills and vice versa. The study further established that while individual returns relate to more agreement, market returns have no such effect. The study by Tine (2013) concentrated on the impact of overconfidence and attribution bias in the escalation of commitment and the desire to change the results of the past. This study looked into two cognitive biases—attribution bias and overconfidence in escalation decisions—that we believe contribute to IT commitment escalation, as well as DRPO for its potential mediating effect. 160 IT managers took part in a web-based role-playing experiment to put our research paradigm to the test. Attribution was altered on two different planes (internal and external), resulting in two different treatment scenarios. The study was limited to only IT managers, experimental and not Nigeria.

Mishra and Metilda (2015) examined the impact of investment experience, gender, and level of education on two specific biases, overconfidence and self-attribution, and exploring the relationship between the two biases. Data collected from a sample of 309 mutual fund investors were analysed. The results show that overconfidence is higher among men than women and in- creases with investment experience and education. Self-attribution increases with education, but there is no significant association between self-attribution bias and gender, as also between self-attribution bias and investor's experience. The findings also show a significant association between self-attribution and overconfidence. This study was only a gender based comparative study which is directed at the level of overconfidence and self-attribution among males and females.

Naveed and Taib(2021) empirically test the association of behavioural biases like overconfidence bias and self-attribution bias, and information acquisition with individual investor's decisions. Findings of this study confirmed that behavioural biases (overconfidence bias and self-attribution bias) distort the rationality of individual investors' decision, and information acquisition significantly moderates the relationship of overconfidence bias with investor decisions. Kulal (2022) tried to know the impact of two specific behavioural biases, i.e., Overconfidence and self-attribution, on investment decisions. The result showed that there is a positive impact of overconfidence bias and self-attribution bias on Investment decisions. In addition to this, it also confirmed a positive

correlation between the self-attribution biases of the respondents and the overconfidence bias of the respondents.

Mahina et al., (2018) assessed the effect of self-attribution bias on investment in the Rwanda Stock Exchange. The study used cross-sectional descriptive survey research design to ascertain and establish the effect of behavioural biases on investment in the Rwanda stock exchange. The results confirmed that there was a significant positive linear relationship between self- attribution bias and Investment in Rwanda stock market. The study also concluded that most investors suffered from self-attribution bias in investment in stock markets. The study failed to capture other behavioural biases in the model and non-probability sampling technique was employed. Ullah (2015) investigated the influence of behavioural biases (self-attribution, illusion of control) on investment decisions with the moderating role of financial literacy in context of Pakistan. The study found that the Illusion of control bias has significant positive impact on individual investor investment decision and no support were found for the positive impact of self-serving attribution bias on investment decision. It is also found that financial literacy moderates the relationship between illusion of control bias and investment decision so that it weakens the relationship.

Gautam et al (2021) through their research study, attempted to identify the biases that affect the decisions of individual investors. Further, the study focuses on understanding the inter-relationship between the identified biases, namely overconfidence bias, loss aversion bias, and self- attribution bias. The biases and the investment decisions are positively correlated, which means they move in the same direction. There is a positive impact of the identified biases on the investment decision of individual investors. Gathergood(2012) examined the relationship between self-control, financial literacy and over- indebtedness on consumer credit debt among UK consumers. Lack of self-control and financial illiteracy are positively associated with non-payment of consumer credit and self- reported excessive financial burdens of debt. Consumers who exhibit self-control problems are shown to make greater use of quick-access but high cost credit items such as store cards and payday loans.

3.3   Self-Control and Investment Decision

Sapkota (2023) examined the influence of emotional biases on equity investment decision of individual investors. This study was based on quantitative approach of research with the sample size of 385 individual investors. Evidence indicates that loss aversion bias, overconfidence bias, self-control bias and regret aversion bias had significant positive influence on equity investment decision. Ferreira-schenk & Dickason-koekemoer (2023) examined the theoretical concepts, investor characteristics and investor bias in a risk profile that could influence investors' intent to invest over the long term. Based on traditional investment theory, investment companies acknowledge the impact of risk tolerance on the desired investment horizon of investors. The results indicated that personality traits (extraversion, openness to experience), risk tolerance, and behavioural biases (overconfidence bias) significantly influence long-term investment intentions.

Konstantin (2016) explored how reduced self-control affects individual investment behaviour in two laboratory tasks. Konstantin find no significant main treatment effect, but secondary effects consistent with findings on self-control from other studies and self-control's potential relevance in financial markets. Average behaviour suggests that reduced self-control increases framing effects, but we cannot reject the null hypothesis of equal investment levels between the self-control treatments within each investment frame. Analysing the dynamics of decision making in more detail, self-control depleted participants in the narrow frame reduce their investment levels on average over time which seems to be driven by more intense reactions to investment experiences.

3.4 Self-Control as a Moderator

According to Model of three Mental Resilience System mechanisms and the Strength Model of Self-Control (Baumeister et al., 2007; Davy-dov et al., 2010), individuals with high resilience have additional resources that can be used for harm reduction, health protection and promotion, and those who possess these resources have flexible self- regulating system that can enhance the moderating role of self- control. That is, higher resilient individuals show higher self-esteem and a better ability to perform adaptive behaviours, which requires higher self-control in order to obtain positive mental health and well- being (Baumeister &Tierney, 2011). Hence, at a higher level of resilience, individuals may use cognitive strategies requiring self-control to adjust them to improving behaviour.

Though studies have been conducted on the relationship between behavioural biases and investment decision but results produced were inconsistent. Self attribution was reported in the literature to have mixed results; for example, a positive correlation was reported in the works of Gautam et al., (2021), Madaan and Singh (2019) and Mahina et al. (2018) and negative correlation with investing was the result of Naveed and Taib (2021). Self-attribution bias is a phenomenon in which a person disregards the role of luck or external forces in their own success and attributes success solely to their own strengths and work. Attribute bias is a neutral concept and is used as a descriptor to give information about how a group of securities was chosen. Akbar et al. (2016) concluded that illusion of control and self-attribution favours investor's herding while greater information availability may lead to more logical, reasoned, and rational behaviour, discouraging herding.

Literature available on self-attribution suggested that individuals while making investment decisions effected by self- attribution bias (Hales, 2007) and people prefer to invest in the stock which is generally linked to their preferences of positive outcome. It is stated in the studies that it has a strong relation with overconfidence, overinvestment (Daniel et al., 1998, Barber & Odean, 2002, Dorn & Huberman, 2005, Statman et al., 2006), and under diversification (Goetzmann & Kumar, 2008). Errors classified under the self-attribution bias have a stronger impact on investors and therefore investors suffer from their own cognitive inabilities (Yalçın, 2009). Never the less, self –control measures such as meditation, learning, planning, resisting temptation, focusing on a goal at a time (Liang

et al., 2022), tend to lessen the frequency of these errors by redirecting the attitude of the investors towards making decision capable of yielding favourable return.

According to Gottfredson and Hirschi (1990), Self-control is a behaviour resulting from self-control learning. A self-controlled person exhibits a great deal of willpower and personal control. They do not act impulsively and can regulate their emotions and actions effectively. Kocher et al. (2016) manipulate traders' self-control in the bubble market paradigm introduced by Smith et al. (1988). From these results it seems as if reductions in self-control can have an effect on aggregate market outcomes possibly by being reinforced through the interaction of market participants. This by implication showed that investors who are high risk taker may be guided by self control against unnecessary investment decisions.

Self-control also acts as a protective factor for life satisfaction (Parket al., 2014). Individuals with high self-control tend to employ more positive and less negative coping strategies than those with low self- control, and the use of these positive strategies can increase life satisfaction (Li et al., 2016). Lack of self-control may also be connected with overspending (Heidhues & Koszegi, 2010). More recently, willpower has been explicitly modeled as an internal depletable resource (see Ali, 2011; Fudenberg and Levine, 2012; Ozdenoren et al., 2012).

Tambun and Cahyati, (2023b) tested and analysed self-control moderation on the effect of financial behaviour and spiritual intelligence on financial planning. The results of this study indicate that financial behaviour has proven to have a positive and significant effect on financial planning; spiritual intelligence is proven to have a positive and significant effect on financial planning; self- control is proven to have a positive and significant effect on financial planning; self-control is able to strengthen the influence of spiritual intelligence on financial planning. In a study aimed to prove the role of self-control as a moderator, on the influence of economic literacy and financial management on financial planning, Tambun and Cahyati, (2023a) employed students in Jakarta with a sample of 175 respondents. The findings showed that self-control is able to strengthen the influence of economic literacy on financial planning. The results of the study recommend that if you want to make good financial planning, then economic literacy and financial management are very important factors and support good financial planning. Likewise, with self-control, one is able to strengthen the impact of economic literacy and financial management on financial planning.

3.5 Theory of Bounded Rationality
Bounded rationality is a concept proposed by Herbert A. Simon, an American political scientist, in his 1957 book *Models of Man*. Bounded rationality has come to broadly encompass models of effective behaviour that weaken, or reject altogether, the idealised conditions of perfect rationality assumed by models of economic man. Bounded rationality is comprehensively concerned with the manner actual decision-making process impacts the decisions that arrived (Kinoshita et al., 2013); (Ahmad Zamri, Ibrahim, Haslindar, Tuyon, 2017). The theory assumed that people are not fully rational and not

capable of making logical decisions as against the common belief in economic models that people are fully rational and capable of making logical decisions. Humans base their decisions on their limited knowledge and cognitive capacity.

This study considered this theory appropriate to underpin the model because it identified time limit, human reasoning abilities and limited knowledge as the driving factors in decision making. Time within which individual is expected to carry out analysis before making decision is limited and as such gives way to people to engage in some irrational mental short cut such as self-attribution bias. Likewise, bounded rationality also assumed individual limited knowledge; knowledge in this context includes market information. This enables the individual to exercise some behavioural control while making investment decision.

4.0 RESEARCH METHODOLOGY

The study utilised cross-sectional research design with the main objective of acquiring the knowledge to the subject matter and it involves a largely quantitative approach and hypotheses were statistically tested. The population of this study comprised of all the retail investors in Nigeria. Nigerian stock exchange [NSE] (2020) put the number of retail investors to over three (3) million. This mean the actual number of individual investors in Nigeria is not known, thus the population here is treated as infinite.

The study, using Dilman (2007) sample size formula for infinite population, arrived at a sample size of 385. Using the following formula and parameters, the sample size result is as shown below.

$$n = \frac{(Z^2 \; x \; p \; (1-p))}{MoE^2}$$

Where:
n= sample size?
Z= critical value for the desired level of confidence = 1.96
P= the proportion being tested = 0.3
MoE = the desired margin of sampling error = 0.05

$\quad$ n $\quad$ = $(1.96^2 x 0.3 x 0.7)/0.05^2$
$\quad$ n $\quad$ = 0.8067/0.0025
$\quad$ n $\quad$ = 322.68
$\quad$ n $\quad$ = 323

This study increased the sample size by 50 percent and this brought our total sample size to 485.

The questionnaires were adapted from previous research studies. Mayfield et al (2008) scale was used to measure the behaviour of individual investor towards investment decision. Five items were used to measure risk tolerance, 10 items from Mahina, Muturi

and Florence (2018) were used to measure self-attribution. The study employed the 13 item brief self-control scale from Tangney, Baumeister, and Boone (2004). The questionnaire was converted to google form and the link sent to the shareholder through the principal councils of the registered associations of shareholders. The study employed SPSS and PLS-SEM to code, clean the data and analysis.

5.0   RESULTS AND DISCUSSIONS

Google generated data recorded 406 responses for which 5 were invalid and this was coded into SPSS. The data was subjected to preliminary analysis such as missing value, outliers and normality test. Missing values noted were replaced using serial mean. However, in the course of data screening, 13 outliers were noted and deleted from the data set there by bringing the number of usable responses to 388 usable for further analysis.

5.1   Measurement Model

The study assessed the loading, validity and reliabilities of all the constructs of the study. The average variance extracted (AVE) was used to measure the convergent validity of the constructs of the study, whereas Fornel Lacker criterion and cross-loadings were employed for discriminant validity. To determine the internal consistency reliability and validity of all the constructs of this study, composite reliability (CR) was used.

Table 4.1 showed the construct reliability and validity. All items measured the various construct of the study loaded above 0.5 which is the minimum loading recommended by Hair, Black, Babin, Anderson and Tatham (2013). However, items loading below this bench mark were deleted. Consequently, ID4, SA10, RT1, RT2, RT3, SC9, and SC13 were deleted.

Table 1: Loadings, construct reliability and convergent validity

Construct	Item	Loadings	CR	AVE
Investment decision	ID1	0.701	0.745	0.638
	ID2	0.901		
	ID3	0.803		
Risk tolerance	RT4	0.743	0.719	0.769
	RT5	0.838		
Self Attribution	SA1	0.878	0.96	0.683
	SA2	0.956		
	SA3	0.597		
	SA4	0.885		
	SA5	0.823		
	SA6	0.926		
	SA7	0.632		
	SA8	0.845		

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Construct	Item	Loadings	CR	AVE
	SA9	0.822		
Self-control	SC1	0.799	0.906	0.532
	SC2	0.618		
	SC3	0.775		
	SC4	0.716		
	SC5	0.589		
	SC6	0.846		
	SC7	0.864		
	SC8	0.646		
	SC9	0.641		

Note: CR=Composite reliability, AVE=Average variance extracted

From the table 1, all the constructs in the study met the composite reliability benchmark of .7 and average variance extracted of .5.

Also, for discriminant validity the study utilized the Fornell and larker criterion which states that the square root of AVE must be greater than the correlation with other variable in the study. This is as presented in table 4.2 below:

Table 4.2: Discriminant Validity

Construct	ID	RT	SA	SC
ID	0.799			
RT	0.426	0.877		
SA	0.191	0.204	0.826	
SC	0.240	0.120	0.297	0.730

Source: SmartPLS 4 output, 2023

The square roots of AVE are presented in bolded font on the diagonal and it can be observed that the values are greater than the correlations among the constructs, thus this criterion is satisfied.

5.2   Structural Model (Inner Model)

The structural model or inner model is the second part of the PLS-SEM. Hair et' al. (2013) identified four key criteria for assessing the structural model in PLSSEM. These include assessments of significance of the path coefficients, coefficient of determination (R^2), the effect size (f^2), and lastly (4) predictive relevance (Q^2). However, to ascertain the effect of overconfidence behaviour and self-control on investment decision, it is important to carry out a bootstrapping analysis. Bootstrapping was done by using 5000 subsamples using 388 cases. Figure 3 presented the structural model of the direct effects.
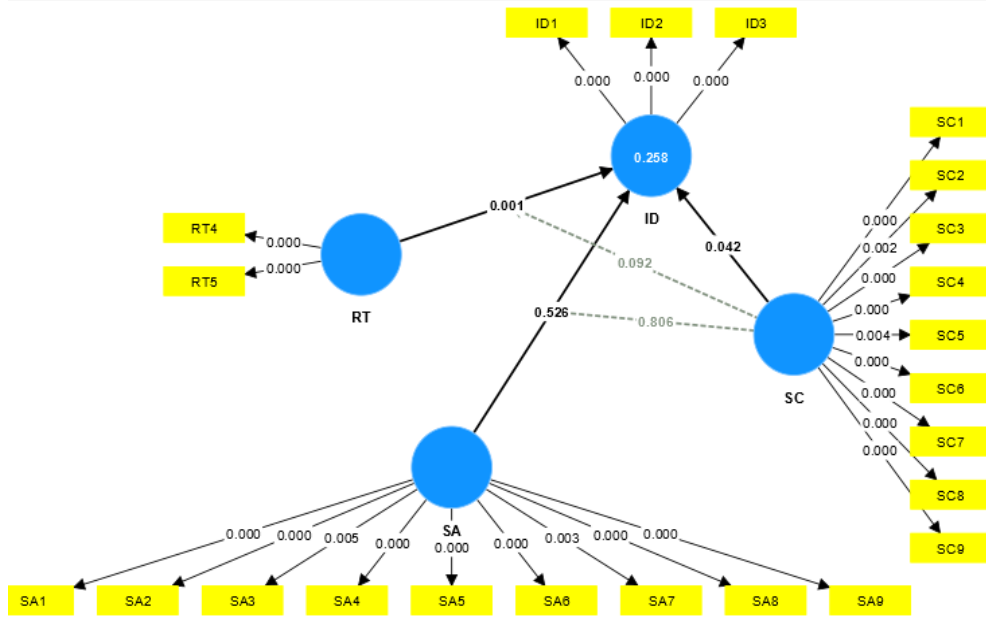
Figure 4.1:

Structural model

Source: SmartPLS 4 output, 2023

5.3 Test of Hypotheses

On this section, the study tested for all the three hypotheses and table 3 presented the results of the structural model with the beta value of the relationships, t-statistic and p-value.

Table 3: Path coefficients

Hyp	Relationship	Beta	Std Error	T-value	p-value	Decision
H1	RT->ID	0.340	0.104	3.262	0.001	Rejected
H2	SA->ID	0.079	0.125	0.634	0.526	Fail to reject
H3	SC->ID	0.196	0.096	2.032	0.042	Rejected
H4	SC x RT -> ID	0.216	0.128	1.686	0.092	Rejected
H5	SC x OC->ID	0.309	0.120	0.245	0.806	Fail to reject
R square						0.311

Source: SmartPLS 4 & SPSS output, 2023

Five hypotheses were formulated for testing; they were tested using structural model from the SmartPLS 4 output. From Table 3, it can be seen that risk tolerance has a significant positive effect on investment decision (β = 0.340, t-value = 3.262, p-value = 0.001). With this result, the first hypothesis (H_1), RT does not significantly affect investment decision, is rejected. Self-attribution does not significantly affect investment decision (β = 0.079, t-value = 0.634, p-value = 0.526), the study failed to reject the second

hypothesis, self-control significantly affects investment decision (β = 0.196, t-value = 1.686, p-value = 0.092)

Self control significantly moderates the relationship between risk tolerance and investment decision (β = 0.216, t-value = 0.634, p-value = 0.526). The fourth hypothesis is rejected. Finally, it was discovered that self-control does not significantly moderate the relationship between self attribution and investment decision (β = 0.309, t-value = 0.245, p-value = 0.806). Thus, the study failed to reject the fifth hypothesis. The R square stood at 0.311 which implies that 31.1% variation in the dependent variable is explained by risk tolerance, self attribution, self-control and the interaction terms. The remaining 68.9% is explained by variables not captured in this model.

5.4   Effect size and Predictive relevance

The effect size of the model is presented in the Table 4. The study assessed the effect size of the exogenous variables (herding behaviour and self-control) on endogenous variable (investment decision) using the F^2. Cohen (1988) recommended that f^2 values of 0.02, 0.15, and 0.35, to represent small, medium, and large effects respectively.

Table 4: Effect size (f2)

Construct	F square
RT	0.062
SA	0.003
SC	0.037
SC x RT	0.029
SC x SA	0.009
Q^2	**0.205**

Source: SmartPLS 4 output, 2023

From Table 4, risk tolerance and self-control had small effect size with f square value of 0.062 and 0.037, self-attribution has no effect with f square value of 0.003. The interaction in term SC x RT has 0.29 effect size on the investment decision.

5.5   Predictive Relevance

The study also utilised Q^2 to assess the predictive relevance of the exogenous variables on the endogenous variable. Q^2 shows how well the data collected empirically can be reconstructed with the help of model and the PLS parameters. From Table 4, it is seen that the Q^2 values of investment decision is 0.205. This value is greater than 0. This also means that all the exogenous variables have 20.5 relevance in predicting investment decision.

6.0   DISCUSSION OF FINDINGS

Risk tolerance was discovered to have significant positive effect on investment decision. The more investors are willing to take risk the better the investing decision. The

results of this study are in accordance with the position of theory and in line with researches conducted by Adielyani and Mawardi (2020), Jain and Kesari (2020) and Nur Aini and Lutfi (2019) and Praba (2016), the study contradicts the finding of Kusumaningrum et al., (2019b) who employed mostly students as respondents to their survey and this may be the reason for such contradiction

Also, self-attribution does not significantly affect investment decision. This finding contradicts the findings of Hoffmann and Post (2014), Naveed and Taib (2021), Ullah, (2015), Wang et al.,(2015), Doukas and Petmezas (2007) and Hales (2007) in which they documented that investment decisions are effected by self-serving attribution bias. Individuals overestimate internal factor and underestimate external factor while making investment decision (Libby & Rennekamp, 2012). This differs from the position of prospect theory and bounded rationality.

It was discovered that self-control had a significant positive effect on investment decision. The greater the self-control the better the investing decision. Moreover, people with good self-control are able to prioritise needs over momentary desires. Self-control has a strong influence on determining investing decision (Purwidianti et al., 2022). Also consistent with the findings of this study are the studies conducted by (Konstantin, 2016; Sekścińska et al., 2021; Siska et al., 2021; Ullah, 2015). Finally, the result indicated that self-control significantly moderates the relationship between risk tolerance and investment decision

7.0   CONCLUSION AND RECOMMENDATIONS

The study, based on the findings, concludes that risk tolerance and self-control have significant effect on investment decision and self-attribution does not significantly affect investment decision. While self-control significantly moderates the relationship between risk tolerance and investment decision, it failed to significantly moderate the relationship between self-attribution and investment decision. The study suggests the following recommendations.

i.   Investors should pay more attention to increase the tolerance of risk in the market by improving their financial knowledge through financial education, increasing the trust in the financial advisors, increase their sources of income and mental readiness and reduces over reliance

ii.   Investors should learn not to overrate their abilities, skills and knowledge, this will enable them to better decision making.

iii.   Investors should cultivate the habit of resisting temptations, breaking bad habit and limiting first impulse, this will help improve and focus one's thoughts, attitude and actions regarding achieving a particular goal and consequently improve investment decision

iv.   Self-control mechanisms should be developed to help curb the excesses of overreaction to personal abilities. However, investors who are equipped with high

sense of self-control will be able to resist bad habits in herding to achieve better investing decision.

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