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The Presence of Investor Overconfidence in the Stock Market and Its Impact on Investment Decisions in South Africa

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Abstract: Investor overconfidence continues to generate high interest due to its perceived impact on investment decisions. This research investigated the existence of overconfidence among investors in South Africa and its link to investor decision making and socio-demographic variables in South Africa. A quantitative approach with a structured survey questionnaire was used to collect data from 107 professional investors. The analysis was conducted using descriptive statistics, ANOVA, correlations and regression analysis. Overall, the findings suggest that investor overconfidence is present among South African investors and significantly impacts investor decision making. The results further indicate that demographic variables have a significant influence on investor overconfidence and decision

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making, where young, more inexperienced investors and males tend to be more overconfident in their investment decisions. This study has important implications for investors and policymakers regarding investor overconfidence in decision making.

Keywords: overconfidence; behavioural biases; demographic factors; investment decision

JEL Classification: G11; G12; G18; G40; G41

1. Introduction

Investment decisions are a multifaceted process that includes assessing risks, analysing markets, and forecasting returns. In this regard, investor behaviour plays a crucial role in determining the outcomes of these investment decisions (Sudirmana, Nurnasrina, Syaipudin & Priyatno, 2024). Kahneman and Tversky (1979) recognised that investors' behaviour was not always rational, and their utility was often not maximised. In proposing their prospect theory, Kahneman and Tversky (1979) showed that these deviations occur due to cognitive biases, often resulting in the market price of securities deviating from their intrinsic value. One of the cognitive biases in behavioural finance is overconfidence in which investors tend to overestimate their capabilities, underestimate risks and continue trading in situations where rational investors would not trade (Tariq and Ullah, 2013).

Moreover, Daniel and Hirshleifer (2015) noted that while investors study financial markets with the intent to beat the market and earn a higher-than-expected return, overconfidence along with a bull market can cause a conservative or a moderate investor to act as an aggressive investor. This results in stock prices overreacting to information, leading to significant deviations from their intrinsic values (Yeh & Yang, 2014). However, in the South African context, investors tend to underestimate their returns and are usually underconfident. Dowie (2014) notes that the negative recall bias of the financial crisis of 2008 and the negative market returns experienced during this period may be a possible explanation of such underconfidence. With the negative recall bias, investors tend to report adverse events more often than reporting positive events when asked to recall a recent emotional event (Dowie, 2014). Hence, this persistent negative recall bias often led to underconfidence.

Investor overconfidence is more evident in countries with market characteristics such as high market volatility and high levels of corruption; typical of poorly performing markets (Griffin et al., 2007). In these markets, positive returns build confidence to an overconfident level such that the return-volume relationship is strong, thus reinforcing the overconfidence in the market. This is a typical characteristic of most developing and emerging markets such as South Africa, hence the conducting of this study. Additionally, overconfident investors tend to trade excessively and overestimate their expected returns which, in turn, can increase stock prices, market volatility and price distortions. As Abbes (2013) mentioned, this was the case during the 2008 financial crisis, a finding that highlights the necessity of

examining the role of investor overconfidence in investment decisions in emerging markets. This study draws attention to the effect that overconfidence might have on investment decisions in South Africa and provides vital information to investors interested in South African listed stocks. This information is also useful for policymakers whose responsibility is to implement policies that enhance the effectiveness of the stock market.

2. Theoretical Framework

Traditional finance theories rely on assumptions of rationality and market efficiency. Fama (1970) described an efficient market as one where all the available information concerning a stock is already and fully incorporated in the stock prices. Stock prices react rapidly to any new information in the market. However, Fama (1970) identified three levels of efficiency. In the lowest level, the weak form, all historical information is already incorporated in stock prices. Investors can only use public and private information to earn abnormal returns (Degustis & Novickyte, 2014). In the second level, the semi-strong form, stock prices reflect historical price information and publicly available information (Gupta, Preetibedi & Mlakra, 2014). Thus, technical or fundamental analysis cannot be used to generate abnormal returns. In the strong form, the highest level of efficiency, past, public and private information is reflected in prices. Thus, no information can be used to earn abnormal returns (Yildirim, 2017).

This theory hinges on several assumptions. First, investors behave and thus rationally value securities. Second, if investors behave irrationally, their trades are assumed to be random. Third, random irrational behaviour effects are subject to elimination by rational arbitrageurs (Shleifer, 2000). However, studies by Degustis and Novickyte (2014), Malkiel (2003) and Shiller (2003) disparaged the EMH for its assumption of investor rationality. As evidence, Degustis and Novickyte (2014) cited the EMH's failure to explain market anomalies as excess stock price volatility, overreaction by investors, return seasonality and asset bubbles. Yet, most of these anomalies can be explained by investors' heterogeneous beliefs created by their psychology. Due to the psychological influences, their actions essentially drive assets market prices away from the fundamental value (Daniel, Hirshleifer & Subrahmanyam, 1998). The popularity of this assertion led to the rise of the field of behavioural finance.

Behavioural finance refers to the study of how psychological factors impact an individual's behaviour in evaluating and taking action to make a calculated decision on their investments (Gupta, Preetibedi & Mlakra, 2014). Therein, it is asserted that investors do not always make rational investment decisions but are subject to human cognitive and emotional biases during asset pricing and resource allocation activities (Taborda, 2017). According to Toma (2015), these biases include greed, fear,

anchoring, mental accounting and cognitive dissonance. These biases result in systematic cognitive errors in their determination of returns and their risk tolerance (Sedaghati, 2016) whilst also dealing with the psychology in investors' decision-making process (Taborda, 2017). According to Ritter (2003), the errors present in people's thinking, activities, and information processing pose limitations to traditional models. If these theories continue to assume rationality, they will not accurately explain market events and pricing patterns. Parveen et al. (2021) examined various behavioural biases such as anchoring and confirmation leading to overconfidence and investment decisions.

In this study, the focus was on investor overconfidence bias since it is one of the most common traits amongst investors (Baker et al., 2019; Trejos et al., 2019). It refers to the tendency of an individual to overestimate their ability to achieve success (Landier & Thesmar, 2008). According to Moore and Healy (2008), overconfidence results in individuals being unrealistically optimistic regarding their ability to foresee potential uncertainty or their precision in predicting pure chance events. Overconfident investors rate their skills and prospects higher than those of their peers (Landier & Thesmar, 2008) and overestimate and rely on the accuracy of their information (Odean, 1998). They tend to trade excessively (Kaustia et al., 2008) and make riskier decisions (Statman et al., 2006). Scheinkman and Xiong (2003) asserted that these actions contribute to market volatility and speculative price bubbles.

The study also considered some demographic variables which have been found to influence investors' overconfidence. For instance, Barber and Odean (2001), Dowie (2014) and Mishra and Metilda (2015) revealed that men are more overconfident than women. They trade more frequently, with stronger self-efficacy and higher risk tolerance than women but still have a lower success rate. Grable et al. (2009) reported that young investors considered themselves extremely knowledgeable, whereas Subramanium and Athiyaman (2016) found that age was negatively correlated with risk tolerance and confidence. Older investors have less time to recover from losses than younger investors, and as they are approaching retirement, they tend towards safer investments (Dickason & Ferreira, 2018). However, Crawford and Stankov (1996) and Korniotis and Kumar (2011) showed that older investors are more overconfident because they have gained substantial investment knowledge.

Gloede and Menkhoff (2011) found that less experienced investors were more overconfident than experienced investors. In line with this, Subramanium and Athiyaman (2016) noted that experienced investors become more rational and are thus less likely to take on more risk after a period of abnormally successful profits. However, Kirchler and Maciejovsky (2002) found that experienced investors display higher levels of overconfidence than less-experienced investors, implying that market experience does not lower the level of behavioural biases. Sahoo et al. (2019) found that the degree of overconfidence increased with the level of education. This

was in line with an earlier finding by Lutfi (2010) that investors' education correlates positively with their risk tolerance and level of participation in the stock market. Mishra and Metilda (2015) stated that educated investors attributed success to their inherited characteristics and believed that they were more skilled than their less-educated counterparts.

3. Review of Empirical Studies

Empirical studies on investor overconfidence in developed markets go as far back as the 1980s. For instance, Estes and Hosseini (1988) examined gender and confidence in the United States (US) and found that women exhibited lower confidence than men because women tend to underestimate their own skills and overestimate the skill of their peers. Experience and the amount to invest were also found to be significant determinants while age, years of college and business experience were not. Similarly, Moore and Prims (2017) examined how various forms of overconfidence correlate with age and found that a lifetime of experience, instead of leading to improved decision-making, increased their confidence levels. Ouarda and El Bori (2014) investigated if there are continuous impacts of overconfidence bias and the disposition effect on the European stock market, using a dynamic panel data analysis, found that overconfidence bias contributed to excessive investments being made rather than the disposition effect.

Investor overconfidence has also been documented in emerging markets. A study by Bayyurt, Karisik and Coskun (2013) sampled 2036 Turkish investors in 2013 to examine how women and men differ in their individual investment preferences using discriminant analysis and logistic regression. The findings indicated that male investors favour investing in ordinary shares and real estate, while their female counterparts are more risk-averse and prefer investing in gold and time deposits. This shows that men display higher levels of overconfidence than women. Onsomu (2015) sought to identify the impact of age on investor decisions on the Nairobi Securities Exchange found a significant relationship between age and overconfidence bias. Investors in the 18-30 age group were the most impacted, while those in the 31-40 age range were the least impacted. This contrasts with Zaidi and Tauni (2012), who found a non-significant relationship between age and overconfidence bias on the Lahore Stock Exchange.

Additionally, Fachrudin (2016) found no substantial relations in investment decisions between education and investment experience. Linking investor overconfidence and investment decision making in developing markets, Shah and Mahmood (2017) examined the relationship between investment decisions, heuristic biases and perceived market efficiency by surveying 143 investors on the Pakistan Stock Exchange (PSX). They concluded that heuristic biases like representativeness,

overconfidence, and anchoring negatively affect perceived market efficiency and the investment decisions of traders on the PSX. Bibi (2021) explored the impact of overconfidence bias on investment decisions, examining whether the relationship is positive or negative, as well as the mediating effect of risk perception and the moderating effects of self-attribution bias and the illusion of control. A survey method, using a highly structured questionnaire, was administered to 216 individual and institutional investors in Islamabad. The findings indicated a positive and significant relationship between investor overconfidence and investment decisions, with risk perception acting as a full mediator of this relationship, while self-attribution bias served as a moderator. Shunmugasundaram and Sinha (2024) examined the impact of behavioural biases on investment decisions in India through a serial mediation process involving overconfidence and disposition effects. They assessed how these biases affect the investment decisions of life insurance policyholders by means of a structured questionnaire. The investigation involved 501 insurance policyholders chosen through snowball sampling. The results showed that behavioural biases do affect investment decisions of life insurance policyholders, with the serial mediation model supporting the notion that these biases affect decisions via overconfidence and disposition effects.

In the South African context, Dowie (2014) examined investor confidence in a sample of South African researchers at selected universities in terms of their ability to predict unit trusts returns. By comparing the fund return and their estimated return, the results indicated that the investors were underconfident. Further, women underestimated their results more than the men. This is consistent with Willows and West (2015) who found that south African male investor tends to display more overconfidence traits than their female counterparts. Willows and West (2015) concluded that investor overconfidence is more prevalent in men investors, who display higher risk tolerance and self-efficiency.

The reviewed literature shows strong evidence of overconfidence bias in the stock market and how it affects investment choices. The literature consistently shows that behavioural biases affect investors and that an entirely rational investor does not exist, and as such, investor irrationality in return estimation should be expected. Studies have also shown that excessive trading, optimism and self-attribution are prominent characteristics of overconfident investors. Further, investor experience, age, gender and level of education are critical demographic variables that influence investor overconfidence. However, the overconfidence is dynamic and as it changes with the prevailing conditions. Additionally, the limited studies focusing on the South African market have produced different results with Dowie (2014) finding evidence for underconfidence while Willows and West (2015) supported the presence of overconfidence. This emphasizes the need for further investigation on the overconfidence of investors in the South African market as well as other developing markets.

3. Methodology

3.1. Data Sample

This study investigated overconfidence among investors in the stock market and evaluated its effect on investment choices using a survey. The target population was individual professional investors within South Africa, and a non-probability convenience sampling method was applied to choose the study participants conveniently. According to Etikan (2016), this sampling collects data from easily accessible and available participants to participate in the study. The study managed to get a sample size of 107 participants, which is sufficient according to Hair et al. (1998). The participants were grouped based on demographic variables as well as investment experience.

3.2. Research Instrument

A structured questionnaire was employed to gather data. Participants were invited electronically through the link posted by the researchers on the LinkedIn platform. The questionnaire consisted of three sections with closed-ended questions. The first section consisted of four multiple-choice questions concerning the participants' social-demographic variables, including details about age, gender, highest qualification and trading experience in stock markets. This information was used to develop investors demographic profile.

The second section consisted of seven questions and used the five-point Likert scale, going from to 5 being strongly disagree and strongly agree respectively to identify the presence of investor overconfidence. Participants were asked to rate their investment knowledge, their ability to predict future share prices and their likeliness to invest in riskier investments for maximum gain. The third section comprised of five questions to examine the effect of overconfidence on investor decision making. Participants were asked to share their investment decision-making criteria regarding risk and safety consideration and whether they preferred domestic stock to international stock. To further analyse investor decision-making on the stock market, participants were asked hypothetical questions about the stock market. Each scenario was developed in a manner that the response from each individual reflected their underlying overconfidence bias.

Answers from the second and third sections of the survey were converted into numerical values and used to calculate the average 'confidence score', from 1 to 5, indicating the level of confidence displayed by an investor. A score of 2.5 means that an individual displays a neutral confidence level and that greater than 2.5 indicates traits of overconfidence. On the other hand, a score of less than 2.5 indicates traits

of underconfidence. To verify the reliability of the scales, the study employed Cronbach's alpha which quantifies how a group of variables are closely related.

3.3. Variables Description

Although the study's two main variables were investor overconfidence and decision making, the different socio-demographic variables purported to be drivers of these two variables were considered. As alluded to above, certain behavioural traits are associated with specific demographic characteristics (Baker et al., 2019). Thus, this study employed different socio-demographic variables, namely, age, experience, education and gender, to identify their impact on investor overconfidence and decision making. To depict overconfidence levels in an individual, participants were asked questions related to the stock market that estimated the precision of their knowledge. With regards to decision making, which Jain and Kesari (2020) defined as the process in which investors can gather knowledge about the different financial products to make decisions, this paper focused on four socio-demographic variables, namely gender, level of education, age and experience in stock investment based on the literature on their significant impact on individuals' investment decisions (Geetha & Ramesh, 2012). From the summary statistics in Table 1 below, many participants were between 21-40 years (53.30%), 32.70% fell into the age group 41-60 years, while 6.50% of the participants were in the 61 years and above age group. The sample consisted of 58.9% male and 41.1% female. A third of the participants had a postgraduate qualification (33.6%), and 64% of the participants had under five years' experience in investing in the stock market.

Table 1. Descriptive statistics of the sample

	Code	Sample (n=107)	Percentage (%)	Cumulative %
Gender				
Female	1	63	59	59
Male	2	44	41	100
Age group				
Below 21 years	1	8	7	7
21 to 30 years	2	34	32	39
31 to 40 years	3	23	21	60
41 to 50 years	4	21	20	80
51 to 60 years	5	14	13	93
61 years and over	6	7	7	100
Education				
Below Matric	1	2	3	3

Matric	2	24	22	25
Certificate	3	5	5	30
Diploma	4	15	14	44
Degree	5	25	23	67
Honours	6	27	25	92
Masters	7	9	8	100
Experience in stock investment				
0-1 year	1	42	39	39
2-5 years	2	27	26	65
6-10 years	3	16	15	80
11-15 years	4	9	8	88
16 or more years	5	13	12	100

3.4. Data Analysis

3.4.1. Chi-square Test

The chi-square test is used to test whether a relationship exists between two categorical variables (Ugoni & Walker, 2014). In this study, the test was conducted on the connection among the socio-demographic variables (education, age group, gender and investment experience) and investor overconfidence and investment decision making. The null hypotheses, tested using the chi-square statistic were set as:

H_{01}: *There is no relationship between the socio-demographic variables (education, gender, age group and experiences in investment) and investor overconfidence.*

H_{02}: *There is no relationship between the socio-demographic variables (gender, age group, education, and experiences in investment) and investor decision making.*

3.4.2. Analysis of Variance (ANOVA)

ANOVA tests for notable differences among the averages of two or more groups. In this study, the ANOVA test was used to determine if the behavioural bias, overconfidence and investor decision making differ by the demographic subgroups age, gender, education and experience (Sow, 2014). The null hypotheses, tested were set as:

H_{01}: *There is no significant influence from the socio-demographic variables (gender, age group, education, and experiences in investment) on investor overconfidence.*

H_{02}: *There is no significant influence from the socio-demographic variables (gender, age group, education, and experiences in investment) on investor decision making.*

3.4.3. Pearson's Correlation Coefficient

The Pearson's correlation coefficient test was used to investigate the robustness and direction of the statistical association between investor overconfidence and decision making. However, this association does not imply causation. The null hypotheses associated with this, tested using the Pearson correlation coefficient was set as:

H_{01}: *The presence of investor overconfidence does not impact investment decision making.*

3.4.4. Regression Analysis

Regression analysis served as a statistical tool to explore the connection between variables and determine if a relationship existed between investor overconfidence and decision making. This procedure followed Kumari and Yadav (2018). The model's strength and the relationship between a dependent variable and its predictors was determined using the following regression. Accordingly, with Y, the dependent variable as decision making; α as the constant; β as the coefficient for investor overconfidence; X as the independent variable investor overconfidence, and ε as the error term, the study employed the following regression model:

$$Y = \alpha + \beta x + \varepsilon \quad (1)$$

According to Uyanik and Guler (2013), this method is considered simple and reliable and hence was used to determine the model's overall fit using the R2 values. The R2 measures how well the predictors explain the outcome in the model, while the beta coefficient is used to identify whether the independent variable is a negative or positive predictor. A high correlation between the predicting variables could lead to a phenomenon referred to as multicollinearity (Aloe & Becker, 2017). Multicollinearity results in beta coefficient estimates with infeasible signs. It reduces the estimated coefficients' precision and weakens the statistical power of the regression model. Therefore, a test for multicollinearity using the Variance Inflation Factor (VIF) to ensure the reliability of the regression analysis was conducted. A VIF of 1 suggests no multicollinearity among factors, but that of above 1 indicates that the predictors could be moderately correlated. A high correlation may be problematic as signified by a VIF that is between 5 and 10. If the VIF exceeds 10, then the regression coefficients are assumed to be poorly estimated due to multicollinearity (Akinwande et al., 2015).

4. Results and Discussion

Before conducting the analysis, Cronbach's alpha was utilised for evaluating reliability of responses from Likert scale surveys and measure internal consistency. According to Hinton et al. (2004) a reliability coefficient with a Cronbach's alpha of

0.50 and above was deemed moderately reliable, 0.70 and above as good, and 0.90 and above as best. The calculated Cronbach's α coefficients for the seven items measuring overconfidence (α = 0.915) and the five items measuring decision making (α = 0.530) were above the accepted score of 0.5. This suggested a degree of consistency in the obtained scores.

4.1. Analysis of Investors Overconfidence and Its Predictors

Table 2 presents the mean, standard deviation, and Chi-Square of the scoring patterns of the participants in relation to the statements assessing overconfidence. Based on the Chi-Square test, a statistically significant difference was observed in the scoring pattern for the 2nd, 4th, 5th and 7th statements, whilst there was no difference in the 1st, 3rd and 6th statements (P>0.10). The statement with the highest support for investor overconfidence is the 2nd statement, "I feel myself qualified to make investment decisions." 45.8% of participants agreed or strongly agreed with the statement, with a mean overconfidence score of 2.72 and a standard deviation of 1.227. Statements 4 and 5 are also linked to investor overconfidence as they present investors the opportunity to gauge their own abilities compared to their peers (Odean, 1998). These statements have mean overconfidence scores of 2.94 and 2.96 with standard deviations of 1.258 and 1.196, respectively. The average score to these questions above 2.5 suggests that many respondents consider themselves qualified in making investment decisions and believe their capability to predict uncertainty or choose profitable stocks is higher than their peers. This is consistent with literature and confirms the presence of investor overconfidence in the data set.

Table 2. Respondents rating on presence of overconfidence bias in investment

Statements	SA	A	N	D	SD	Mean	Std. D	*P*-val
1. I think that I have complete knowledge of the stock market.	15%.	22.4 %	26.2 %	18.7 %	17.8 %	3.02	1.317	0.396
2. I feel myself qualified to make investment decisions.	19.6 %	26.2 %	24.3 %	22.4 %	7.5%	2.72	1.227	0.019
3. I feel I can predict future share prices better than others.	12.1 %	23.4 %	28%	17.8 %	18.7 %	3.07	1.286	0.102

4. I am confident of my ability to do better than others when picking stocks to invest in.	13.1 %	27.1 %	27.1 %	17.8 %	15%	2.94	1.258	0.048
5. I believe that my investment will pay higher dividends as compared to others' investment.	15.9 %	16.8 %	33.6 %	24.3 %	9.3%	2.96	1.196	0.001
6. I make riskier investments for maximum gain.	13.1 %	20.6 %	25.2 %	22.4 %	18.7 %	3.13	1.304	0.349
7. I think the stocks (shares) of the company I like the most are good enough for long term investment.	17.8 %	21.5 %	29%	23.4 %	8.4%	2.83	1.217	0.014
Likert scale= Strongly Agree (SA), Agree (A), Neutral(N), Disagree (D) Strongly Disagree (SD)								

The ANOVA, mean, and standard deviation of various socio-demographic variables (age group, education, gender and experience in stock market investment) and the existence of investor overconfidence are given in Table 3. The ANOVA value for gender indicates a statistically significant difference among the participants in relation to overconfidence at a 5% significance level. Thus, the null hypothesis of no significant influence of socio-demographic variables (gender) on investor overconfidence; was rejected. The study found a higher mean confidence score for the male participants than females by approximately 0.4. This suggests that overconfidence bias was more prevalent in men. This is consistent with Barber and Odean's (2001) findings that men tend to display more confident traits than women.

Regarding the age group and the presence of overconfidence, the ANOVA value for age was statistically significant at 10%, indicating a weak significant difference among the participants in terms of decision making. Hence, the study could not reject the null hypothesis of no significant influence of the socio-demographic variables (age) on investor overconfidence at 5% significance level. Nonetheless, the analysis showed that the participants below 21 years had the highest mean value of 3.46. The lowest value was found for the respondents within 51-60 years of age, with a mean

value of 2.35. This suggests that older investors (51-60 years) show less overconfidence bias in their investment decision. These findings are contrary to Crawford and Stankov (1996) findings, concluding that there is a greater level of overconfidence among older investors. The ANOVA value indicated no statistically significant difference concerning overconfidence bias at all significance levels (1%, 5% and 10%). Consequently, the study could not reject the null hypothesis of no significant influence of socio-demographic variables (education) on investor overconfidence.

In terms of the years of experience the participants have in investing in the stock market, the ANOVA test indicated a statistically significant difference in the presence of overconfidence bias. Thus, the null hypothesis of no significant influence of socio-demographic variables (experience) on investor overconfidence; is rejected. Furthermore, the analysis suggests that the mean value of 1.93 for the respondents with 16 or more years of experience was the lowest. The mean value of 3.3 for the respondents with 0-1 years of investing in the stock market was the highest. This suggests that less experienced investors have tendencies of overconfidence. These findings are consistent with Gloede and Menkhoff's (2011) findings that investors with less experience are less rational due to a greater degree of overconfidence.

Table 3. Influence of socio-demographic variables and the presence of overconfidence bias

		N (107)	Mean	Std. Dev	P-value
Gender	Female	63	2.778	1.016	0.035
	Male	44	3.201	0.995	
Age	Below 21 years	8	3.464	0.719	0.061
	21 to 30 years	34	3.105	1.069	
	31 to 40 years	23	3.118	1.074	
	41 to 50 years	21	2.918	0.571	
	51 to 60 years	14	2.357	1.200	
	61 years and over	7	2.367	1.183	
Education	Below Matric	2	2.929	0.909	0.562
	Matric	24	3.060	0.946	
	Certificate	5	3.571	1.015	
	Diploma	15	2.876	0.895	
	Degree	25	2.760	1.092	
	Honours	27	2.825	1.057	
	Masters	9	3.365	1.208	
Experience	0-1 year	42	3.344	1.003	0.000

	2-5 years	27	3.148	1.055	
	6-10 years	16	2.589	0.728	
	11-15 years	9	2.651	0.530	
	16 or more years	13	1.934	0.762	

The multiple regression analysis of overconfidence predictors is shown in Table 4. At a 1% level of significance, the F-test indicates that the model was highly statistically significant. This indicates that the predictors – education, experience, age and gender - jointly contributed to explaining the variations in overconfidence, and the regression model fits the data. However, the regression analysis shows that individually, the variables age, gender and education were statistically insignificant in explaining overconfidence. The study found the variable experience as the only statistically significant variable in explaining overconfidence individually. In this study, the variable experience was a negative predictor of overconfidence. This is shown by the negative beta coefficient of -0.306, which indicates that every additional year of experience decreased overconfidence by 0.306. This suggests that more experienced investors display fewer traits of overconfidence which is supported by the findings of Gloede and Menkhoff (2011). Thus, as investors gain more experience, they become more rational, leading to a lower degree of overconfidence (Gloede & Menkhoff, 2011).

Table 4. Multiple regression on socio-demographic predictors of overconfidence

Predictor		**Age**	**Gender**	**Education**	**Experience**
F-value	7.471				
P-value	0.000				
Beta coefficients		-0.048	0.267	0.048	-0.306
Error		0.075	0.185	0.054	0.078
P-values		0.525	0.153	0.376	0.000
Collinearity statistics (VIF)		1.357	1.053	1.089	1.457
R square	0.109				
Adj R Square	0.074				

Predicted	Overconfidence

4.2. Analysis of Investors Decision Making and Its Predictors

The mean, standard deviation, and Chi-Square results of the respondent's decision making on their investments are given in Table 5. Based on the 5% significance level, a very significant difference in the score pattern for the first, third, fourth, and fifth statements was indicated by the Chi-Square test, whilst there was no difference in the second statement. The questionnaire's third, fourth, and fifth statements all had mean values higher than 2.5. This indicates that the participants displayed traits of overconfidence concerning these three statements. However, the mean score for the first statement was below 2.5, suggesting traits of under confidence. Most respondents agreed or strongly agreed to the 1st statement, "I consider levels of risk associated with particular stocks before investing in the stock market." This suggests that many of the participants base their investing choices on the amount of risk associated with each stock. This result is highly significant and consistent with Statman et al. (2006), who found that investors with fewer traits of overconfidence tend to consider the level of risk of investments before making decisions.

Table 5. Respondents rating of the statements measuring decision making

Statements	SA	A	N	D	SD	Mean	Std.	*P*-val
1. I consider levels of risk associated with particular stocks before investing in the stock market.	29.9%.	30.8 %	18.7 %	16.8 %	3.7 %	2.34	1.181	0.000
2. I would like to realise the gain as soon as the stock increases in price.	15.9%	20.6 %	29 %	20.6 %	14 %	2.96	1.273	0.128
3. I make sure that my investment in stocks has a high level of safety.	21.5%	27.1 %	29 %	17.8 %	4.7 %	2.57	1.150	0.001
4. In my opinion, it is safe to invest in local stocks rather than to buy international stocks.	9.3%	13.1 %	34.6 %	21.5 %	21.5 %	3.33	1.219	0.000
5. Considering a stock purchased one month ago for R100, it is found that the stock is	10.3%	14 %	27.1 %	19.6 %	29 %	3.43	1.318	0.007

now selling at R110. After holding the stock for one more period, there are 50-50 odds between gaining an additional R10 or "breaking even". I would like to sell the stock to realise the R10-gain now.								
Likert scale= Strongly Agree (SA), Agree (A), Neutral(N), Disagree (D) Strongly Disagree (SD)								

The ANOVA, mean, and standard deviation of several socio-demographic factors and investor decision making are shown in Table 5. The gender ANOVA value was significant at 10% but not 5%, indicating a weak significant difference among the respondents in terms of decision making. The null hypothesis of no significant influence of the socio-demographic variables (gender) on investor decision making could not be rejected. This suggested that investment decisions did not vary with gender. However, the mean value measured for the male respondents was 0.24 lower than that measured for the females.

Regarding the age group and the respondent's decision making, the ANOVA value obtained indicated significance at 10% and not 5%, indicating weak significance. Hence, the investigation could not reject the null hypothesis of no significant influence of the socio-demographic variables (age) on investors decision making. Nonetheless, the analysis indicated that the respondents within 41 to 50 years had the lowest mean value of 2.69 while the respondents within 31 to 40 years had the highest mean value of 3.29. This suggests that younger investors (31 to 40) show more overconfidence bias in their investment decisions since they have more time to bounce back from losses than older investors. This is consistent with Subramanium and Athiyaman's (2016) study that compared to older investors, younger investors exhibit greater confidence while making investing decisions. They noted that younger investors failed to take responsibility for their losses but attributed their failures to external factors, commonly associated with overconfidence bias.

The ANOVA value indicated a statistically significant influence of education on decision making for the respondent's qualification. Consequently, the null hypothesis, which states that socio-demographic variables (education) do not significantly affect investor decision making; was rejected. Further analysis revealed that the mean value of 2.6 measured for the respondents who hold a degree was the lowest. At the same time, the mean value of 3.3 for those with a certificate level education was the highest. This suggests that investors possessing a lower educational level typically show more overconfidence bias in their investment

decisions. This is consistent with Lutfi's (2010) findings that educated investors tend to make more rational investment decisions. The ANOVA test indicated no statistical significance in terms of the respondents' years of experience in stock market investment. Therefore, the null hypothesis of no significant influence on the socio-demographic variables (experience) on investors decision-making was not rejected.

Table 6. Influence of socio-demographic variables and the presence of overconfidence bias

		N (107)	Mean	Std. Dev	P-value
Gender	Female	63	3.02	0.671	0.087
	Male	44	2.782	0.781	
Age group	Below 21 years	8	2.900	0.151	0.085
	21 to 30 years	34	2.806	0.612	
	31 to 40 years	23	3.296	0.791	
	41 to 50 years	21	2.695	0.789	
	51 to 60 years	14	3.029	0.833	
	61 years and over	7	2.800	0.693	
Education	Below Matric	2	2.800	0.283	0.000
	Matric	24	2.683	0.659	
	Certificate	5	3.320	0.460	
	Diploma	15	2.707	0.595	
	Degree	25	2.624	0.604	
	Honours	27	3.207	0.580	
	Masters	9	3.733	1.063	
Experience	0-1 year	42	2.810	0.618	0.370
	2-5 years	27	3.126	0.883	
	6-10 years	16	2.788	0.702	
	11-15 years	9	3.111	0.641	

The results of the decision-making predictors' multiple regression analysis are presented in Table 7. According to the observed VIFs, the measured independent variables did not exhibit multicollinearity. At the 5% level of significance, the F-test indicates that the goodness of fit model was statistically significant. This indicated that age, gender, education and experience jointly explained the variation in investor decision making, and the regression model fits the data. However, individually, the variables age, gender, and experience could not explain the variation in decision making as they were statistically insignificant. On the other hand, education was the only significant predictor for decision making. Therefore, the beta coefficient of 0.124 indicated that for every additional year of education, decision making increased by 0.124. This implies that education influences decision making and is an imperative element in explaining the risk-taking behaviour of investors. These

findings are aligned with studies conducted by Estes and Hosseini (1988), Moore and Prims (2017), and Fachrudin (2016).

Table 7. Multiple regression on socio-demographic predictors of decision making

Predictor		Age	Gender	Education	Experience
F-value	3.110				
P-value	0.018				
Beta coefficients		-0.010	-0.193	0.124	-0.018
Error		0.057	0.141	0.041	0.059
R square	0.109				
Adj R Square	0.074				
Predicted	Decision making				
P-values		0.860	0.172	0.003	0.768
Collinearity statistics (VIF)		1.359	1.053	1.089	1.457

4.3. Relationship Between Overconfidence and Decision Making

According to Table 8's Pearson correlation coefficient, overconfidence and decision-making were found to have a weakly positive link (ρ=0.249). This relationship was significant at 5% level of significance. While correlation measures association between variables, it does not, however, imply causation. The association between overconfidence (an independent variable) and decision-making (a dependent variable) was examined using a simple regression analysis, as indicated in Table 9. The standardised beta coefficient showed a strong correlation between decision-making and overconfidence. This is consistent with the study by Shah and Mahmood (2017). They found that investor overconfidence impacted investment decision making, although they found a negative effect on the decisions made by investors. Moreover, Odean (1998) showed that overconfident investors tend to make riskier decisions. The low R^2 (6.2%) suggests weak explanatory power for the predictor in the model; thus, other factors other than overconfidence drive investment decision-making. The null hypothesis that investor overconfidence does not impact investment decision making was therefore rejected.

Table 8. Pearson Correlation

		Overconfidence	Decision making
Overconfidence	Pearson Correlation	1	0.249
	P-value		0.010

	N	107	107
Decision making	Pearson Correlation	0.249	1
	P-value	0.010	
	N	107	107

Table 9. Regression on predictor of decision making

Predictor	**Overconfidence**
F-value	6.961
P-value	0.010
Beta coefficient	0.176
Error	0.067
P-value	0.010
R Square	0.062
Predicted	**Decision making**
Collinearity statistics (VIF)	1.000

The above section analysed and interpreted the impact of overconfidence on investor's decision making in the stock market. According to the findings, a large percentage of the participants have formal education, young and had few years of experience in investment. Equally, and while assessing the presence of overconfidence among the participants, it was found that many consider themselves qualified to make investment decisions. The socio-demographic variables suggested that overconfidence varied with gender, education, and stock market investment experience. Overall, stock market investment experience was the strongest predictor of investor overconfidence. Furthermore, it emerged that before making an investment in the stock market, many of the respondents base their choices on the risk levels of specific stocks, a trait associated with investors who do not display signs of overconfidence. It was also noted that the respondents' age, gender, and education significantly influenced their investment decision making and education was the strongest predictor of how investors would make decisions. Additionally, a significant but weak positive correlation between overconfidence and investor decision making was also established. Overall, the study conclusively demonstrated that the presence of investor overconfidence ultimately impacted investment decision making. The evidence of overconfidence in the South African market is consistent with Willows and West (2015) and Dowie (2014), who found that investor overconfidence was present in the South African stock market and significantly impacted investor decision making.

5. Conclusion

The idea of market efficiency is predicated on the assumption of rationality of all investors and the complete incorporation of all pertinent information into the asset prices. On the other hand, behavioural finance theories contend that investors are irrational and that their investment choices are influenced by cognitive and psychological biases. Thus, this study examined whether South African investors exhibit overconfidence bias when making investing decisions. The findings showed that many respondents considered themselves qualified to make investment decisions and had faith in their capacity to predict uncertainty or choose profitable stocks was higher than their peers, confirming investor overconfidence. The results showed a weak positive linear correlation between decision making and investor overconfidence. The overconfidence bias was more prevalent in men, youthful investors and investors with less experience.

The study's findings bear important implications to various stakeholders such as individual investors and investment firms in increasing their awareness of the impact of investor overconfidence on investment decision making in stock markets. Investors will be able to identify the variables of overconfidence that affect their investment choices. Financial advisors will gain insight into the client's psychology that can aid them in creating a behaviourally modified portfolio. A behaviourally modified portfolio is an alteration of a rational portfolio that considers emotional and cognitive biases. Thus, having a behaviourally modified portfolio will assist investors in reducing or eliminating investor's biases to accomplish the investor's financial goals (CFA Institute, 2018). Since price bubbles and market volatility can emerge as a result of investor overconfidence, this study is important for policymakers in improving the stock market's efficiency and developing pertinent regulations during volatile periods. Future research can consider expanding the sample to survey other domestic and international investors. Further studies can also employ techniques that would reduce overconfidence bias to provide a more accurate analysis. For example, participants should list counterarguments for their estimates before rating on the Likert scale for each question.

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