ARF INDIA
Academic Open Access Publishing
www.arfjournals.com

EXPLORING THE INFLUENCE OF PERSONALITY TRAITS AND BLOOD TYPE ON RISK ATTITUDES: INVESTORS' PSYCHOLOGICAL BIASES ROLE IN THE EGYPTIAN MARKET

Tariq H Ismail[a1], Mohamed S. El-Deeb[b] and Shrouk S. Farouk[c]

[a]Professor, Department of Accounting, Faculty of Commerce, Cairo University, Cairo, Egypt, and International Academy for Engineering and Media Science, Egypt;
E-mail: t.hassaneen@foc.cu.edu.eg
[b]Professor, Faculty of Management Sciences, October University for Modern Sciences and Arts University (MSA), Cairo, Egypt; E-mail: msamy@msa.edu.eg
[c]Teaching Assistant, Faculty of Commerce, MTI University, Cairo, Egypt;
E-mail: shrouksamyfarouk@gmail.com
[1]Corresponding author

Abstract: This study investigates the relationship between personality characteristics, blood type, and psychological biases and its impact on investor's risk attitude in the Egyptian setting. It employs a poll based on the "Myers-Briggs Type Indicator" to find out how participants feel about taking risks. The data was analysed statistically by multiple regression and path analysis using AMOS (26) software. The findings show that (i) there is a strong association between personality traits and blood type as well as psychological biases, and (ii) there is a significant relationship between blood type and risk attitude. Additionally, the findings imply that risk attitude is influenced by an investor's demographic characteristics, with males being higher risk-takers than females and investors with five or more years of experience on the Egyptian Stock Exchange being more likely to be high-risk investors. Furthermore, the blood type of an investor can significantly affect their attitude towards risk; those with blood type "A" tend to take greater risks, whereas those with blood type "O" are more cautious when making risky investments. This paper contributes to the subject of behavioral finance. *First*, it helps investors become more conscious of their cognitive biases, which can aid in more logical decision-making. *Second*, it reveals each investor's attitude towards taking financial risks; which might assist them

in making better choices. *Third*, it investigates the connections between gender, character qualities, psychological prejudices, blood type, and risk-taking behaviour.

1. INTRODUCTION

The modern portfolio theory and the capital asset pricing model have revolutionized the investment industry by considering not only market trends but also the behavior of individual investors in their investment choices. As a result, numerous studies have been conducted to provide empirical support for these theories, investigating whether investors display psychological biases and how the decision-making process can be influenced by various variables, including personality traits and psychological biases (Sharpe, 1964).

Personality qualities, risk tolerances (maximum uncertainty), and psychological biases are known to affect financial decision-making. Specifically, an investor's personality, blood type, and psychological biases might influence their financial decisions, even when their primary objective is to maximize profits. Focusing on such individual characteristics and their interconnections may assist in predicting investor sentiment towards the Egyptian Stock Exchange (EGX). While the literature has been dominated by traditional explanations, such as the efficient market hypothesis of Fama (1970), the potential impact of these individual factors is one worthy of further investigation.

The Japanese concept furthered that each blood type carries its peculiar personality profile. This concept was brought to the Japanese by Takeji Furukawa in 1927 and ever since then, the Japanese people have believed that blood types are responsible for the difference in an individual's personality, his strengths, and weaknesses. However, previous studies have found no predictable relationship of the ABO blood groups with personality and thus come to believe that environmental factors are more crucial than blood groups for shaping personality.

Since only limited research is available concerning the EGX, and possibly the impact of personality, blood type, and/or psychological biases on the investor's financial decisions, more work in this context is very much required. This study investigates into the blood type and psychological aspects of the EGX investors and measures their risk tolerance by analyzing how these factors influence the emotions and financial decision-making in the Egyptian stock market.

This study contributes to the literature of behavioral finance from three critical dimensions: *firstly,* it might enable investors to identify their set of cognitive biases, which will help them make better decisions. *Secondly*, it shows investors' tolerance of financial risk, hence allowing them to make better and more relevant investment decisions. *Finally*, this paper explores the relationship between gender, personality, psychological biases, blood types, and risk-taking behavior.

By addressing these aspects, this study contributes to a deeper understanding of Egyptian stock market investor behavior and decision-making processes, with implications for both individual investors and financial professionals.

The rest of this paper is organised as follows: Section 2 presents a review of the literature and the development of hypotheses. Section 3 is the research design. Section 4 is the data analysis and discussion of results. Section 5 is the conclusions and suggestions for future reserach.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Personality Traits and Investor Risk Attitude

The investment decision-making process is critical in how financial managers allocate corporate capital to assets that will yield future rewards. Several key elements form the basis for determining investment alternatives, including demographic and personality traits such as age, gender, experience, education level, overconfidence, risk tolerance, and representativeness bias (Kubilay & Bayrakdaroglu, 2016).

Personality is defined as "the total of traits that distinguish an individual from others and that an individual has by nature and gains later in life." Therefore, an investor's personality traits are considered an effective factor in their financial decision-making. Acciarini et al. (2021) provided support for the influence of individual behavioral biases on investment decisions, while Kumar and Dudani (2023) presented empirical evidence on how specific personality traits affect investors' trading behavior in the Pakistani commodity market.

The literature suggests several areas for further investigation. For instance, neurotic individuals may exhibit a stronger tendency for herd behavior bias, although contradictory findings suggest a weak association between herd bias and neuroticism (Lakshmi et al., 2013). Herd behavior, risk aversion, overconfidence, representativeness heuristics, and reflection influence both

short-term and long-term investors (Lakshmi et al., 2013). Zaidi and Tauni (2012) found that overconfidence positively correlates with agreeableness, conscientiousness, and extraversion.

Research has identified representativeness, availability, and anchoring biases as the main heuristics impacting investors' decisions. Additionally, it has been suggested that blood type may affect personality development and the interaction between personality traits and psychological biases.

The Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) have been extensively studied in the context of investor decision-making. Conscientious individuals tend to invest more conservatively, while extraverts are more inclined to take on higher risks. However, neuroticism has been associated with poor investment performance, as nervous and stressed investors are more likely to make suboptimal decisions (Rajasekar et al., 2022).

Based on the above discussion, the following hypothesis can be formulated:

H1: There is a significant impact of personality traits on investor risk attitude in the EGX.

2.2. Blood type and investor risk attitude

The potential influence of blood type on personality traits and behavior is derived from the Japanese concept of "ketsueki-gata," which posits that blood type shapes one's temperament. However, "ketsueki-gata" is considered a pseudoscience, as there is no conclusive evidence that blood type directly affects personality or risk attitude (Miller, 2011).

Nevertheless, there have been efforts by various researchers to study the correlation of blood group with attitude towards risk across domains: health and finance to social contact. For example, it has been reported in earlier studies that people with the "O" blood group are found to have lower levels of cortisol, a stress hormone, and hence are better at coping with stress. Others have suggested that blood type "A" might increase the possibility of variability in risk perception and decision-making. In addition, some studies have determined that memory impairment and stroke may be more possible with blood type "AB", which again may influence a person's cognition and decision-making skills unfavorably.

However, none of these studies indicates which factor is the cause and which one is the effect, and they also do not control for other factors that may

influence the latter, such as age, gender, education, income, culture, or personal experience. They also do not measure financial risk tolerance or investor behavior, which is complex, multidimensional, and linked to various psychological and contextual factors.

It is hence very early, and not needed, to say that blood type has a great impact on investors' attitudes toward risk. Furthermore, testing of the hypothesis requires more intensive and broader research in order to understand the underlying mechanism and moderators of the possible association of blood type and risk attitude. Consequently, the following hypothesis can be advanced:

H2: Blood type has a significant impact on investor risk attitude in the EGX.

2.3. Psychological biases and investor risk attitude

Extensive research proved that, due to psychological biases, investors could make a big detour from rationality. The most common biases include overconfidence bias, when investors perceive themselves as knowing and being capable of more than they really can; this further leads to excessive risk-taking. Another well-known one is loss aversion bias, which means investors are more interested in avoiding losses than gaining; thus, it makes them adopt a more conservative investment strategy. Besides, confirmation bias may provide grounds for poor decision-making whenever investors look for information that confirms their ideas.

Dervishaj (2018), summarized studies related to psychological biases and their impacts on financial behaviors, giving particular emphasis to the role of cognitive biases in investment decision-making. It was concluded that psychological biases substantially impact the decisions of each investor and may vary among different types of investors. According to Dervishaj, 2018, by being in a position to understand and deal with these psychological biases, better investment decisions may be considered that can help avoid financial catastrophes. Basically, the psychological biases trap the investors into not being able to make rational decisions in investing. On the other hand, research showed that individual genders may be differently affected by the biases, which again warranted more research in this direction.

Based on the existing literature, the following hypothesis is proposed:

H3: Psychological biases have a significant impact on investor risk attitude in the EGX.

2.4. The interaction between the blood type, personality traits and psychological biases and its impact on investor risk attitude

Several studies have explored the relationship between personality variables and investor decision-making biases. Ahmad (2020) and Yadav and Narayanan (2021) find evidence for the proposition that overconfident investors are less conscientious and open, while investors with loss-aversion bias are more neurotic. For example, Brown and Taylor (2014) examined the impact of the Big Five personality traits on UK stock market investor decision-making and found that conscientiousness tends to be associated with higher diversification, while extraversion is associated with investment in small-cap stocks.

The literature still indicates that blood type can influence personality. Rogers and Glendon (2003) concluded that blood types and personality traits are more than likely associated with psychological biases in the general population. The findings of that study did indicate that individuals with "B" blood scored higher on neuroticism, those with "O" blood scored higher on extraversion and optimism bias, individuals with "A" blood scored higher on agreeableness, and those with "AB" blood scored higher on conscientiousness. Among the ABO gene phenotype, Kanazawa analyzed a survey in large-scale (N = 3,750) and extracted that the personality traits of the respondents were more remarkable than any other blood type. In this regard, Parag suggested blood type can influence personality as each blood group is associated with different traits according to the Japanese viewpoint.

However, not all studies have found a link between blood type and personality. For instance, Pecujlija et al. (2015) found that blood types have the same age and trigger patterns during moral reasoning, while Alsadi (2020) and Tsuchimine et al. (2015) found no significant or only a weak connection between blood type and personality. Patil et al. (2016) and Joshi et al. (2017) also found no significant differences in character qualities across individuals with different blood groups, suggesting that external influences may play a more important role in shaping personality than blood group.

Personality encompasses a wide range of attributes, including emotions, abilities, motivations, social and cognitive qualities, values, beliefs, attitudes, and opinions (Kleinman, 2014). Individual vulnerability to behavioral biases, risk attitudes, and temporal preferences can influence investment strategies (Li et al., 2023; Ahmed, 2022; Jamshidinavid, 2012; Jureviciene & Jermakova, 2012; Kowert & Hermann, 1997). Baddeley et al. (2010) illustrated how personality affects financial decisions, showing that herding behavior can be explained by

both individual traits and socialized personalities, with a negative association between extraversion and herding.

Based on the above discussion, the following hypothesis is formulated:

H4: The mediating role of psychological biases significantly affects the relationship between personality traits and blood type and their impact on investor risk attitude in the EGX.

3. RESEARCH DESIGN

3.1. Research Method

The study relies on a primary data that represents the response of a sample of individual investors in the EGX on a questionnaire that was designed for this purpose; which based on the The Myers-Briggs Type Indicator (MBTI) (Briggs Myers, 1962) employed for the assessment of psychological preferences of individuals in perceiving the world and making decisions. This questionnaire was adapted based on the review of relevant literature provided by Jiang et al. (2023), Zeb et al. (2020), Kaur & Goel (2022), De Bortoli et al. (2019), Chouhan & Meman (2019), Cheng-Po Lai (2019), Thambireddy (2021), Rashwan & Shaqfa (2021), Jabeen (2020), Sahi (2017), Kannadhasan et al. (2016), Bakar & Chui (2016), and Moueed et al. (2015).

There are closed-ended questions; where the respondents were asked to mark their answers from a set of alternatives provided. The alternatives are used to collect behavioral, attitudinal, and classification data from the respondents. This instrument is divided into five sections and consists of 44 questions. The first section is for demographic information about the investors. The second section (questions 1 to 8) examines the participants' personality traits. The third section (questions 9 to 20) helps determine the investors' risk attitudes. The fourth section (questions 21 to 30) evaluates the psychological biases that may affect the participants' financial decision-making in the market. Finally, the fifth section (questions 31 to 44) helps determine the extent to which blood type may shape the participants' personality.

The participants are asked to express their viewpoint on each question using a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree."

3.2. The Study Variables

This study incorporates one dependent variable; the investor's risk attitude and two independent variables; the personality traits and the effects of blood type

on personality, as well as, there is one mediating variable; which is the psychological bias. Each of these variables are measured based on the questionnaire that was designed for this purpose. Table (1) shows variables measurement used in this study.

Table 1: Descriptions of the study variables and measurements

Variables	Measurement	Description
Dependent variable		
Risk Attitude	Each answer is weighted from (1 to 5) by its risk rate (low, moderate, high or very high). As this scale consists of 12 questions (the second section of the questionnaire) to determine the level of risk tolerance.	Level of risk tolerance increases with the increase of agreeableness on each question. The averages between 1 and 1.79 indicates the level of strongly disagree which indicates the lowest level of risk tolerance and vice versa when averages are between 4.20 and 5.
Independent variables		
The Personality Traits	The personality trait scale is weighted from (1 to 5) and consists of 8 questions (the second section of the questionnaire) to determine 5 traits as shown below: - Openness to Experience - Conscientiousness - Extraversion - Agreeableness - Neuroticism	Personality traits that take the value from 1 to 5; where a value of 1 to be assigned if the participant scores low for each dimension, and 5 for participants with the highest score.
Blood Type & Personality	Effects of blood type on personality is weighted from (1 to 5) and consists of 14 questions (the fifth section of the questionnaire helps in determining to what extent the blood type shapes personality.	Cross tabulation between physical blood types (section 1) and, personality traits (section five) is used.
Mediator Variable		
The Psychological Biases	The psychological biases scale is weighted from (1 to 5) and consists of 10 questions (the fourth section of the questionnaire) to determine 7 psychological biases as follows: - Representativeness - Availability - Anchoring - Overconfident - Overoptimistic - Regret aversion - Herding	Psychological biases take the value from 1 to 5. A value of 1 to be assigned if the participant scores low for each dimension and 5 for participants with the higher score.

3.3. Research Model

In order to test the hypotheses, the following multiple regression model is formulated:

$$IRA = \alpha + \beta_1 PT + \beta_2 PB + \beta_3 BT + e \qquad (1)$$

Where:

IRA = investor's risk attitude.

α = model' constant

β_1- β_3 = regression coefficients

PT= personality traits

PB= psychological biases

BT= effect of blood type on personality

3.4. Sample Selection

The sample selection process employed in this study was designed to mitigate bias and guarantee the inclusion of a representative sample. A random sampling technique was employed. Due to the inability to meet all EGX investors; where the stock market regulations require that all transactions should be executed through brokers or financial analysts. Hence, the authors depend on a short interview with some brokers to explain the purpose of the survey and seeking their support to distribute a google form questionnaire (that takes a maximum of 15 minutes to be answered) to a random sample of investors. An Arabic version of the questionnaire was distributed to a sample of 500 investors, of which 300 were returned (with a response rate of 60%) during the time frame from January to March 2023. It was noted that 22 questionnaire had missing data; therefore, the final sample comprises 278 respondents. Table (2) describes the demographics of the sample of investors.

A total of 148 investors (53.3 percent) have less than three years of experience in the EGX, 19 investors (6.8 percent) have investment experience between three and five years, and 111 investors (39.9 percent) have above five years of investment experience. The results reveal that the investors who participated in this study were comprised of 188 males and 90 females. The sample of investors has diverse physical types of blood: 40.28% hold "A" type, 17.26% "B" type, 17.6% "AB" type, and 24.86% "O" type. The majority of investors (81.29 percent) are more than 30 years old, and the reminders (18.81 percent) are less than the age of 30. A total of 192 investors are committed to

Table 2: Demographic information items of surveyed sample of investors

Demographic Information Items	Investors (n=278)
Years of experience in the EGX	
<3	148
3 <5	19
>5	111
Gender	
Males	188
Females	90
Physical Blood Type	
A	112
B	48
AB	49
O	69
Age (Years)	
<30	52
30< 45	105
>45	121
Mentoring the Stock Prices Periodicity	
Yes	192
No	86
Following the Stock Market News	
Yes	181
No	97

mentoring the stock price periodicity, and 65.1 percent of investors are following the stock market news.

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1. Reliability and Validity

To check the reliability of the questionnaire, the coefficient "Alpha Cronbach" is used. As shown in Table (3), the coefficients of the variables personality traits, investor risk attitude, psychological biases, and the effect of blood type on personality are greater than the acceptable percentage, which is equal to 70%. The results indicate a high degree of validity in the respondents' answers to the questionnaire.

<div align="center">**Table 3: Reliability and validity test of the questionnaire**</div>

Dimensions	Number of Questions	Alpha Cronbach	Validity
Personality Traits	7	0.823	0.907
Investor Risk Attitude	10	0.891	0.944
Psychological Biases	7	0.842	0.917
Effects of Blood Type on Personality	13	0.919	0.958
Overall dimensions	37	0.953	0.976

4.1. Descriptive Statistics

Table (4) states the descriptive statistics of the variables used in this study, including the mean, the standard deviation, and the coefficient of variation. Descriptive statistics of the personality traits of investors (questions from 1 to 8) indicate that they are towards the mean value of the dimension (3.566), with coefficients of variation (20.15%). This suggests that there is homogeneity in response at 79.85%. There is a significant difference between the response (actual) mean and the expected mean (4) at confidence level 99%. The results of the T-test (10.070) indicate no significant difference between the average of the achieved response and the target average, with a significant level less than 0.05, which is higher than the value of the T-tabulated value.

EGX investors' risk attitude (21.42%) suggests homogeneity with 78.58%. At confidence level 99%, the response (actual) mean differs significantly from the expected mean (4). The T-test (-14.148) shows no significant difference between the achieved response and the goal average, with a significant level below 0.05, exceeding the T-tabulated value. Psychological biases have coefficients of variance (21.18%) and mean values of 3.384. This shows 78.82% response uniformity. At confidence level 99%, the response (actual) mean differs significantly from the expected mean (4). The T-test (-14.320) shows no significant difference between the average of the achieved response and the desired average, with a significant level less than 0.05, higher than the T-tabulated value.

<div align="center">**Table 4: Descriptive statistics of variables**</div>

Variables	Mean	St. Dev.	C.V.	T-Test	P- Value
Personality Traits	3.566	0.719	20.15	-10.070	0.000
Investor Risk Attitude	3.385	0.725	21.42	-14.148	0.000
Psychological Biases	3.384	0.717	21.18	-14.320	0.000
Effects of Blood Type on Personality	3.425	0.743	21.69	-12.907	0.000

Descriptive data show that investors' blood types affect their personalities to the mean (3.425) with coefficients of variance (21.69%). This shows 78.31% response homogeneity. At confidence level 99%, the response (actual) mean differs significantly from the expected mean (4). Results show no significant difference between achieved response and target average.

4.2. Correlations between Variables

Table (5) reveals a substantial positive connection between "personality traits and investor risk attitude" (sig 0.000 < 0.01), with a correlation coefficient of 0.690. A significant positive connection exists between "psychological biases and investor risk attitude" (sig 0.000 < 0.01, correlation coefficient 0.700, confidence interval 99%). A strong positive association exists between blood type and investor risk attitude, with a confidence range of 99% (sig 0.000 d" 0.01, correlation coefficient 0.655). Thus, multiple regression is needed to examine how personality factors, psychological biases, and blood type affect investor risk attitudes.

Table 5: Pearson correlation between variables

Dimension		*Investor's Risk Attitude*	*Personality Traits*	*Psychological Biases*	*Blood Type & Personality*
Investor's Risk Attitude	Correlation	1			
	Sig.				
Personality Traits	Correlation	0.690	1		
	Sig.	0.000			
Psychological Biases	Correlation	0.700	0.656	1	
	Sig.	0.000	0.000		
Blood Type & Personality	Correlation	0.655	0.603	0.693	1
	Sig.	0.000	0.000	0.000	

Table (5) shows strong correlations between investor risk attitude, personality traits, psychological biases, and blood type and personality. The present study reveals that people with certain personality traits, psychological biases, and blood types are more likely to take risks and prefer financial decisions that reflect such behaviour. As shown by Al-Tamimi and Bin Kalli (2009), Cao et al. (2021), and Kengatharan and Kengatharan (2014), psychological characteristics affect investor behaviour. Thus, a multiple regression analysis is needed to determine each independent variable's impact on investor risk variability.

4.3. The results of multiple regression analysis

There is a need to test the impact of more than the independent variable on the dependent variable. Hence, this study examines the impact of personality traits, psychological biases, and blood type on an investor's risk attitude. The results of the regression analysis are shown in Table (6).

Table 6: Impact of personality traits, psychological biases, blood type on investor's risk attitude

Model	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	Beta		
(Constant)	0.301	0.152	-	1.972	0.050
Personality Traits	0.348	0.053	0.345	6.632	0.000
Psychological Biases	0.318	0.058	0.314	5.461	0.000
Effects of Blood Type	0.224	0.053	0.229	4.207	0.000
Dependent Variable: investors' risk attitude					
R	0.780				
R^2	0.608				
Adjusted R^2	0.604				
F	141.849				
P-value	.000				

The results show that personality factors significantly affect investor risk attitude. The value of "t" (6.632) surpasses the critical value at a significant level of less than 0.01. Statistically, psychological biases affect investor risk attitude, as shown by a "t" value of 5.461 and a significant level below 0.01. This study found that personality, psychological biases, and blood type explain 60.4% of investor risk attitudes. The remaining variability may be due to stochastic error in the model or the exclusion of essential independent variables. Blood type has a statistically significant effect on investor risk attitude, according to this study.

The study concludes that an F-test shows that the model's coefficients are all zero. F-test results show 141.849 and a significance level of less than 0.01. This means the null hypothesis can be firmly rejected and at least one model coefficient is significantly different from zero.

4.4. Path Analysis

Figure (1) depicts the path analysis model that represents the relationships between the dependent variable (investor risk attitude) and independent variables
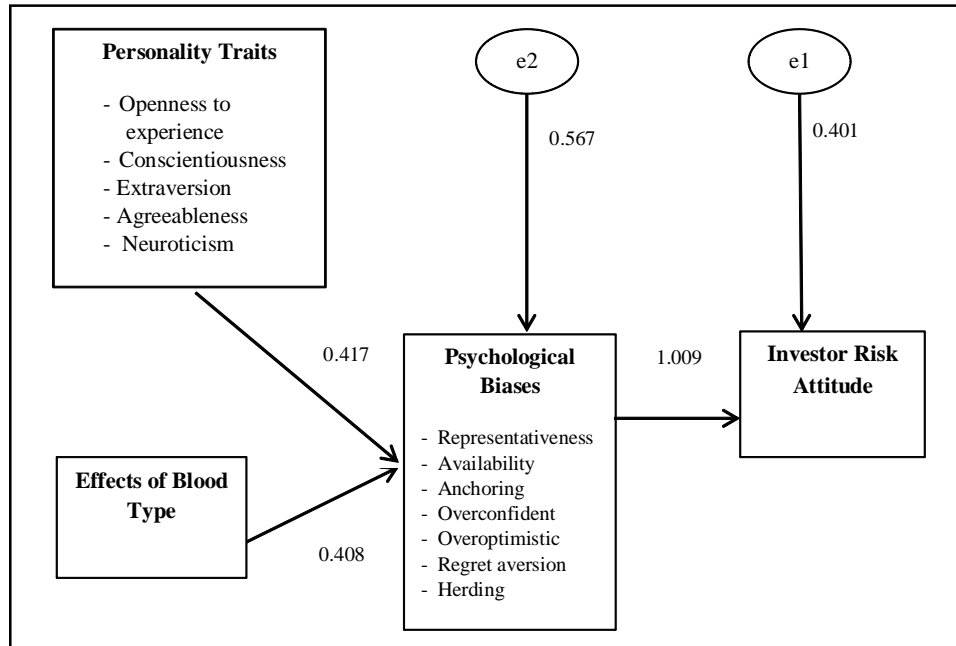
Figure 1: The path analysis model

(personality traits and blood type), and the roles of the psychological biases (as a mediator variable) in such relationships.

The results of the path analysis are shown in Table (7), where the blood type and personality traits have a significant effect on psychological biases, as the standardised regression coefficients are 0.423 and 0.418, respectively, with R2 0.567, which means that these variables explain 56.7% of the total variation in the psychological biases. Furthermore, psychological biases have a significant effect on investor risk attitude, as the standardised regression coefficient is 1.009 with R2 0.401, which means that this variable explains 40.1% of the total changes in investor risk attitude.

However, the results indicate a significant relationship between personality traits and blood type, which is consistent with the findings of Pecujlija et al. (2015), Sharifi et al. (2015), Parag (2015), and Mary Rogers & Glendon (2003), who also found a significant effect of blood types on personalities. However, the results are not consistent with the findings of Patil et al. (2016), Rogers and Glendon (2003), Tsuchimine et al. (2015), and Joshi et al. (2017). Furthermore, the study found a significant relationship between personality traits and psychological biases. This supports the findings of previous research, which suggests that individual characteristics can influence how people make decisions.

Table 7: Regression model coefficients

Dependent Variables	*Paths*	*Independent Variables*	*B*	*BETA*	*C.R.*	*P-value*	*R2*
Psychological Basis	<---	Effects of Blood Type	0.408	0.423	10.003	0.001	56.7%
	<---	Personality Traits	0.417	0.418	9.912	0.001	
Investor Risk Attitude	<---	Psychological Biases	1.009	0.997	16.147	0.001	40.1%

Table (8) presents the direct and indirect effects of the variables, where the personality traits and blood type have a significant direct effect on investor risk attitude (B = 0.418 and 0.423, P 0.05), as well as a significant indirect effect on investor risk attitude with psychological biases as the mediating variable (B = 0.417 and 0.422, respectively, P 0.05).

Table 8: Standardized direct and indirect effect of variables

	Standardized Total Effects		*Standardized Direct Effects*		*Standardized Indirect Effects*	
	Psychological Biases	*Investor Risk Attitude*	*Psychological Biases*	*Investor Risk Attitude*	*Psychological Biases*	*Investor Risk Attitude*
Personality Traits	0.418	0.417	0.418	0.000	0.000	0.417
Blood Type	0.423	0.422	0.423	0.000	0.000	0.422
Psychological Biases	0.000	0.997	0.000	0.997	0.000	0.000

However, there is a need to test the goodness of fit statistics of the path analysis, where some common fit indexes are to be calculated, such as the Tucker-Lewis index (TLI), the comparative fit index (CFI), and the root mean square

Table 9: The goodness of fit statistics of the path model

Code	*Value*
Chi-square	2.982
p_value	0.084
GFI	0.995
NFI	0.995
IFI	0.997
TLI	0.981
CFI	0.997
RMSEA	0.075

error of approximation (RMSEA). Table (9) presents the goodness of fit statistics of the path analysis. According to the values shown, the p-value of the Chi-square is not significant (P-value > 0.05), which indicates the absence of significant deviation between data and the model. This proves that the model is correct and refers to consistency with the data (Grace and Bollen, 2005).

As shown in Table 9, the Tucker-Lewis index (TLI) of the model > 0.80 and the comparative fit index (CFI) of the model > 0.90 indicate that the root mean square error of approximation is lower than 0.08 (RMSEA 0.08). The result has shown that the path model is a good fit; where Chi-square is 2.982, RMSEA 0.075, NFI 0.995, and CFI 0.997. From the presented findings, it can be supported that the final structural model fit was adequate, since its CFI and NFI >0.90 and also its RMSEA of 0.80. To this regard, it would appear that there is a good fit in this model and the observed data.

It may be outlined from the regression analysis that the impact of personality traits on investor risk attitude is significant and positive. It therefore means that the investors with a particular personality trait have the tendency or inclination to be more risk-prone in making financial decisions. These findings are according to previous findings in which big five personality traits have already shown their relationship with risk preferences. This fact can be acknowledged by considering studies by Bye and Lamvik 2007 and Nicholson et al. 2005. Mathur and Nathani 2019 have concluded that high-risk behaviour is followed by those people who have impulsive personality traits.

Additionally, the results imply that psychological biases have a significantly positive effect on the propensity for risk; therefore, any person who suffers from cognitive fallacies is bound to show more adventurous behavior. The above-stated statement is supported and also goes in tandem with the existing body of literature in behavioral finance, which has clearly reviewed various shapes that biases take hold of investors' decision-making and estimations under uncertainty. For instance, the overconfidence bias may lead investors to be highly confident in their competencies and expertise while underestimating all the risks of their investment opportunities (Ahmad and Shah, 2020).

Furthermore, the results indicate that blood type of an individual has a significant positive effective on his risk attitude as an investor, meaning that investors from a particular group of blood types show more attitude towards taking risk compared with other groups of blood types. Such a result is a novel contribution to the literature and has not been explored before. Several studies

have indicated a potential correlation between blood type and personality traits, as well as psychological factors that can impact an individual's risk preference (Tsuchimine et al., 2015). Otonari et al. (2012) discovered a correlation between blood type A and heightened neuroticism as well as decreased extraversion, which could potentially impact an individual's inclination towards risk aversion.

4.5. Demographics of the investor and risk attitude

There is a need to test the extent to which investors' demographic factors (years of experience in the EGX, gender, age, physical blood type, mentoring the stock prices periodically, following the EGX news) might affect their risk attitude. Hence, Kruskal-Wallis and Mann-Whitney tests are employed, where if the significance level is less than 0.05, then there will be a significant difference between investors; otherwise, there will not be significant differences among them. Table (10) shows that there are significant differences between years of experience in the EGX and an investor's risk attitude, where the chi square value is 6.001 and the P-value is 0.05. The detailed results suggested that investors who have five years or more of experience in the EGX are higher risk takers. Investor's gender has a significant impact on the investor's risk attitude (P-value is less than 0.05), and the results concluded that the male mean rank equals (147.55), while the female mean rank equals (122.69); hence, males tend to be higher risk takers than females in the Egyptian stock market.

The results supported that there are significant differences in the investor's attitude towards risk due to the physical type of blood (P-value less than 0.05); the highest mean rank is for blood type "A," as people with blood type "A" are higher risk takers, while people with blood type "O" are more conservative towards risky investments. It seems that an investor's age has no impact on their attitude towards risk.

Table 10: The impact of demographics on investor's risk attitude

(n=278)

Demographics	Chi Square/ Z Value	P-value	Sig.
Years of experience in the EGX	6.001	0.050	Sig.
Gender	-2.415	0.016	Sig.
Blood Type	250.433	0.000	Sig.
Age	2.979	0.226	Not Sig
Mentoring the Stock Prices Periodicity	-1.498	0.134	Not Sig.
Following the Stock Market News	-3.042	0.002	Sig.

Furthermore, the results show that mentoring the stock price periodicity, as a factor, has no effect on the investor's risk attitude (P-value greater than 0.05). Following the stock market news seems to have a significant impact on the investor's risk attitude (the P-value is less than 0.05), and investors who monitor the EGX are likely to be able to reduce their attitude towards risk.

5. CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This study aimed to evaluate the financial personality traits of investors on the Egyptian Stock Exchange (EGX) in order to minimize misperceptions and misjudgements in the investment advice provided by financial consultants, taking into account the psychological biases of investors. The findings of this paper have significant implications for investment experts and financial advisors, as they reinforce the need to consider personality traits when advising and guiding investors. In return, it would also put them in a better position to identify and reduce the potential influence of psychological biases in making financial decisions.

The findings are rather consistent with what any particular type of personality may suggest, further suggesting a possible link in blood type to personality traits in financial behavior and investor type. Prior research has focused on the association of blood type and personality characteristics; some blood types were perceived to be associated with certain personality traits. The findings slightly support the notion that a relevant factor in assessing the financial situation of an investor is consideration of their blood type.

These findings in general help to outline the complex interrelationship between personality traits, blood type, and psychological biases within the financial domain. While the study contributes to the existing literature by providing empirical evidence in the context of the Egyptian Stock Exchange, it also connects to other research that has taken place in varying contexts.

These insights are important to practitioners because it underpins the need to take into consideration individual differences and the psychological biases of investors when offering them investment advice and guidance. We also find that the personality traits and investor risk attitude have a positive association with each other on EGX, a finding that is in agreement with those of Charles and Kasilingam (2014), who found out that personality exerts a moderate effect on the investor's decision frames. It signifies that investor decision-making highly

depends on his personality. Additionally, acceptance of the first hypothesis also agrees with the result of Narooi and Karazee (2015), Wood and Eagly (2012), and Mihaela (2015), stating that extraversion personality traits influence rational and intuitive styles of decision-making positively.

Furthermore, the results revealed that there exists a significant relation not only between blood type and psychological biases but also between blood-type and investor risk attitude. Thus, personality traits, psychological biases, and the investor's risk attitude are significantly influenced by the type of blood an individual has: A, B, AB, or O. It was also found that persons with blood group "A" were more inclined towards being high-risk taker while blood group "O" persons were more risk-averse, partly because psychological biases might have had an impact on blood group "A" persons.

Besides, this research identified that an investor's risk attitude is influenced by the gender factor, whether male or female, rather than by personality traits, psychological biases, or blood type. The results indicate that the male investors are more risk-takers than the female investors and that those investors who have more than five years of experience in the Egyptian Stock Exchange could become higher risk takers possibly as an influence of their longer investment experience.

However, this study has several limitations. First, it analyzes the effect of personality traits, psychological biases, and blood type on investor risk attitude, but does not consider other variables that may shape investors' decisions. Second, the study employs a questionnaire based on the Myers-Briggs Type Indicator to assess participants' risk attitudes, which may not fully capture their actual investment behavior and outcomes. Third, the small sample size limits the generalizability of the results to all investors in the Egyptian Stock Exchange. Fourth, the primary objective was to assess investors' self-reported risk attitudes, which may not consistently reflect their real investment choices and performance, as various factors can influence investment outcomes, including market conditions and external influences.

The results of the current study indicate several promising directions for future research. First, the follow-up studies should extend the demographic scope to encompass an expanded set of investor characteristics, including income levels, educational background, and other socio-economic indicators, in addition to the traditional variables such as gender, age, and professional experience. In this way, the wider demographic profile would enable the researchers to make more sophisticated models with regard to investor risk attitude and behavior.

Second, while the present study focuses on the Egyptian Stock Exchange, future studies should consider making comparisons across a number of emerging markets. Such cross-cultural investigations may help to uncover whether the relationships observed between personality traits, blood type, and investment decisions in the present study are universal or culturally specific. This comparative approach would be very important to comprehend the moderating roles of different market environments and cultural contexts. Third, it is desirable that future studies are more methodologically diverse to arrive at stronger empirical evidence. More specifically, controlled behavioral experiments and analyses of real trading data complement the survey-based approach. Such complementary research methods would yield stronger evidence regarding how personality traits and psychological factors influence real-world investment outcomes.

Other issues that could be elaborated on in financial decision-making include portfolio diversification strategies, risk management practices, and the performance of long-term investments. These various research directions would go a long way toward enhancing our understanding of the complex interrelations between individual characteristics, psychological factors, and financial decision-making in emerging markets and the global financial system.

Declaration of conflicting interests

Funding

References

Acciarini, C., Brunetta, F., and& Boccardelli, P. (2021). Cognitive biases and decision-making strategies in times of change: a systematic literature review. *Management Decision*, 59(3), 638-652.

Ahmad, M., & Shah, S. Z. A. (2020). Overconfidence heuristic-driven bias in investment decision-making and performance: mediating effects of risk perception and moderating effects of financial literacy. *Journal of Economic and Administrative Sciences*, 38(1), 60-90.

Ahmed, Z., Rasool, S., Saleem, Q., Khan, M. A., & Kanwal, S. (2022). Mediating role of risk perception between behavioral biases and investor's investment decisions. SAGE Open, 12(2), 1-18.

Alsadi, R., (2020), Personality traits and their relationship with blood groups among of Palestinian University students, *International Journal of Psychology and Behavioral Sciences* 10(2),34-42.

Baddeley, M., Burke, C., Schultz, W., and & Tobler, T. (2010). Impacts of personality on herding in financial decision-making, Faculty of Economics, University of Cambridge, Working Papers in Economics (CWPE) 1-35.

Bakar, S., and & Chui Yi, A., (2016), The impact of psychological factors on investors' decision making in Malaysian stock market: A case of Klang Valley and Pahang. *Procedia Economics and Finance* 35, (2016) 319 – 328.

Balaji, k., and Aggarwal,V. (2018)., Impact of cognitive biases on individual investor behavior: A Literature review. *International Journal of Research and Analytical Reviews*. 5(3), 392-407.

Beheshtian, F., R. Hashemi and Z. Rashidi, (2015). The five personality factors over the students with four blood types. *Journal of Applied Environmental and Biological Sciences*, 5(8), 45-49.

Brown, S., & Taylor, K. (2014). Household finances and the 'big five' personality traits. *Journal of Economic Psychology*, 45, 197-212.

Bye, R., & Lamvik, G. M. (2007). Organizational culture and risk perception. Zagadnienia Eksploatacji Maszyn, 42(2), 131-146.

Cao, M. M., Nguyen, N. T., and & Tran, T. T. (2021). Behavioral factors on individual investors' decision making and investment performance: A survey from the Vietnam stock market. *The Journal of Asian Finance, Economics and Business*, 8(3), 845-853.

Charles, A., and Kasilingam, R. (2014). Do framing effects of investors determine their investment personality?. *Anvesha,* 7(2), 38-45

Cheng-Po Lai, (2019). Personality traits and stock investment of individuals. *Sustainability Journal*, 11(19), 1-20

Chouhan, P., and & Meman, M., (2019). Personality traits and investment decision. *Journal of Critical Reviews*, 6(6), 2910-2920.

De Bortoli D, da Costa N Jr., Goulart M, Campara J (2019) Personality traits and investor profile analysis: A behavioral finance study. *PLoS ONE*, 14(3), 1-18.

Dervishaj, B. (2018). Psychological biases, main factors of financial behavior: A literature review. *European Journal of Medicine and Natural Sciences Articles*, 14(21).2527-3544.

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, 25(2), 383–417.

Grable, J., & Lytton, R. H. (1999). Financial risk tolerance revisited: the development of a risk assessment instrument. *Financial Services Review*, 8(3), 163-181

Grace, J. B., & Bollen, K. A. (2005). Interpreting the results from multiple regression and structural equation models. *The Bulletin of The Ecological Society of America*, 86(4), 283-295.

Grande, G., Romppel, M., & Barth, J. (2012). Association between type D personality and prognosis in patients with cardiovascular diseases: A systematic review and meta-analysis. *Annals of Behavioral Medicine*, 43(3), 299-310.

Hassan Al-Tamimi, H. A., & Anood Bin Kalli, A. (2009). Financial literacy and investment decisions of UAE investors. *The Journal of Risk Finance*, 10(5), 500-516.

Jabeen, S., Shah, S., Sultana, N., and & Khan, A., (2020). Impact of socio-psychological factors on investment decisions: The mediating role of behavioral biases. *Abasyn Journal of Social Sciences*, 13(1), 1-14.

Jamshidinavid, B., Chavoshani, C., and Amiri, S. (2012). The impact of demographic and psychological characteristics on the investment prejudices in Tehran stock. *European Journal of Business and Social Sciences*, 1(5), 41-53.þ

Jiang,Z., Peng,c,. & Yan. H,. (2023). Personality differences and investment decision-making. Management, Northwestern University, National Bureau of Economic Research, Working Paper 31041, 1-60.

Joshi, M., Bakshi, S., & Bansal, S. (2017). An empirical study of personality and blood group type in Indian context. *Asian Journal of Management*, 8(3), 859-864.

Joshi, M., Bakshi, S., & Bansal, S. (2017). An empirical study of personality and blood group type in Indian context. *Asian Journal of Management*, 8(3), 859-864.

Jureviciene, D., and & Jermakova, K. (2012). The impact of individuals' financial behaviour on investment decisions. In Electronic International Interdisciplinary Conference, 9, 242-250.þ

Kanazawa, M., (2021), Relationship between ABO blood type and personality in a large-scale survey in Japan, *International Journal of Psychology and Behavioral Sciences*, 11(1), 6-12.

Kannadhasan, M., Aramvalarthan, S., Mitra, S. K., & Goyal, V. (2016). Relationship between biopsychosocial factors and financial risk tolerance: An empirical study. *Vikalpa: The Journal for Decision Makers*,41(2), 117-131.

Kaur, A., & Goel, P. (2022). Impact of big-five personality traits on Investor's risk attitude. *Indian Journal of Economics and Development,* 18(2), 477-482.

Kengatharan, L., & Kengatharan, N. (2014). The influence of behavioral factors in making investment decisions and performance: Study on investors of Colombo stock exchange, Sri Lanka. *Asian Journal of Finance & Accounting*, 6(1), 1-23..

Kleinman, P. (2014). Psych 101: Psychology Facts, Basics, Statistics, Tests, and More. Adams Media. Avon, Massachusetts. USA.

Kowert, P. A., & Hermann, M. G. (1997). Who takes risks? Daring and caution in foreign policy making. *Journal of Conflict Resolution*, 41(5), 611-637.

Kubilay, B., & Bayrakdaroglu, A. (2016). An empirical research on investor biases in financial decision-making, financial risk tolerance and financial personality. *International Journal of Financial Research*, 7(2), 171-182.

Kumar, V., & Dudani, R. (2023). The big five personality traits and psychological biases: an exploratory study. *Current Psychology*, 42(8), 6587-6597.

Lakshmi, P., Visalakshmi, S., Thamaraiselvan, N., and & Senthilarasu, B. (2013). Assessing the linkage of behavioral traits and investment decisions using SEM approach. *Journal of Economics and Management*, 7(2), 221-241.

Li, L., Richter, A., & Steinorth, P. (2023). Mental health changes and the willingness to take risks. *The Geneva Risk and Insurance Review*, 48(1), 31-62.

Liu, Q., Sun, Y., & Wu, M. (2021). Decision-making methodologies in offshore wind power investments: A review. *Journal of Cleaner Production*, 295, 126459.

Madaan, G., & Singh, S. (2019). An analysis of behavioral biases in investment decision-making. *International Journal of Financial Research*, 10(4), 55-67.

Mankuroane, E., van Heerden, W., Ferreira-Schenk, S., & Dickason-Koekemoer, Z. (2022). Psychological and behavioural drivers of short-term investment intentions. *International Journal of Economics and Financial Issues*, 12(4), 19-27.

Mathur, G., & Nathani, N. (2019). Personality Traits and Risk Tolerance among Young Investors. International Journal of Innovative Technology and Exploring Engineering (IJITEE), 8(10), 2019-2013.

Myers, I. B. (1962). The Myers-Briggs Type Indicator: Manual, Palo Alto, CA: Consulting Psychologists Press.

Mihaela, P. L. (2015). Personality variables in decision-making. *Procedia-Social and Behavioral Sciences*, 187, 658-662.

Miller, L. (2011). Tantalizing tarot and cute cartomancy in Japan. *Japanese Studies*, 31(1), 74-91.

Moueed, A., Hunjra, A., Asghar, M., and Raza, B., (2015). Role of Psychological and Social Factors on Investment Decision of Individual Investors in IslamAbad Stock Market. Sci.Int. (Lahore), 27(5), 4697-4706.

Murgea, A. (2010). Classical and behavioral finance in investor decision. *Annals of the University of Craiova*, Economic Sciences Series, 2(38), 212-223.

Narooi Z. S. & Karazee F. (2015). Investigating the relationship among personality traits, decision-making styles, and attitude to Life: Zahedan branch of Islamic Azad University as case study in Iran. *Mediterranean Journal of Social Sciences*, 6(6). 311-317.

Otonari, J., Nagano, J., Morita, M., Budhathoki, S., Tashiro, N., Toyomura, K., & Takayanagi, R. (2012). Neuroticism and extraversion personality traits, health behaviours, and subjective well-being: The Fukuoka study (Japan). *Quality of Life Research*, 21, 1847-1855.

Parag, A. (2015). An empirical study on blood types and personality, *International Journal of Science*, *Spirituality, Business and Technology*, 3(2), 32-36.

Patil, J., Kumar, N., Satyam, S. M., Kupusamy, K., Han, L. M., Rozan, R. B., and & Gill, R. K. (2016). Influence of blood group on the character traits: -A cross-sectional study on Malaysian student population. *Journal of Chemical and Pharmaceutical Sciences,* 9(2), 865-868.þ

Patil, J., Kumar, N., Satyam, S. M., Kupusamy, K., Han, L. M., Rozan, R. B., & Gill, R. K. (2016). Influence of blood group on the character traits: A cross-sectional study on Malaysian student population. *Journal of Chemical and Pharmaceutical Sciences,* 9(2), 865-868.þ

Pecujlija, M., Misic-Pavkov, G., & Popovic, M. (2015). Personality and blood types revisited: Case of morality. *Neuroethics*, 8, 171-176.

Rajasekar, A., Pillai, A. R., Elangovan, R., & Parayitam, S. (2022). Risk capacity and investment priority as moderators in the relationship between big-five personality factors and investment behavior: a conditional moderated moderated-mediation model. *Quality & Quantity*, 57, 2091-2123.1-33.

Rashwan, A., and Shaqfa, K., (2021). Measuring the impact of mental accounting on financial and investment decisions among investors. *Arab Journal of Administration, 44* (1), 227-243.

Rathinasamy, V., and Ramasubbian, H., (2020). Impact of big five personality traits on investment decisions. *International Journal for Research in Engineering Application & Management*, 6(2).

Rogers, M. and & Glendon, A. (2003). Blood type and personality. *Personality and Individual Differences* 34 (7), 1099–1112.

Roszkowski, M. J., & Cordell, D. M. (2009). A longitudinal perspective on financial risk tolerance: rank-order and mean level stability. *International Journal of Behavioural Accounting and Finance*, 1(2), 111-134.

Sahi, S., (2017), Psychological biases of individual investors and financial Satisfaction. *Journal of Consumer Behavior*, 16(6), 511–535.

Sharifi, M., Ahmadian, H., and & Jalali, A. (2015). The relationship between the big five personality factors with blood types in Iranian university students. *Journal of Chemical and Pharmaceutical Research*, 7(5), 233-240.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425-442.

Syarkani, Y., & Alghifari, E. S. (2022). The influence of cognitive biases on investor decision-making: The moderating role of demographic factors. *Journal of Strategy and Business, 26(2),* 183-196.

Thambireddy, H., (2021). How psychological biases influence investors decisions – Evidence from Indian stock market. *Kirloskar Institute of Advanced Management Studies Journal*, 1(2), 22-36.

Thomas, T. C., and & Rajendran, G. (2012). BB and K five-way model and investment behavior of individual investors: Evidence from India. *International Journal of Economics and Management*, 6(1), 115-127.þ

Tsuchimine, S., Saruwatari, J., Kaneda, A., & Yasui-Furukori, N. (2015). ABO blood type and personality traits in healthy Japanese subjects. *PlOS One*, 10(5), 1-10.

Wood, W., & Eagly, A. H. (2012). Biosocial construction of sex differences and similarities in behavior. *Advances in Experimental Social Psychology.* 46, 55-123.

Yadav, A., & Narayanan, G. B. (2021). Do personality traits predict biasedness while making investment decisions?. *International Journal of Accounting & Finance Review*, 6(1), 19-33.

Zaidi, F. B., and Tauni, M. Z. (2012). Influence of investor's personality traits and demographics on overconfidence bias. *Institute of Interdisciplinary Business Research*, 4(6), 730-746.þ

Zeb, N.,Iqbal. Z., Zeb, A., and & Khan, M., (2020). Impact of personality traits on investment decision with moderating role of financial literacy. *Ilkogretim Online - Elementary Education Online*, 19(3), 2730-2737.