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IS FINANCIAL RISK TOLERANCE INFLUENCED BY PERSONALITY TRAITS?

Abstract:

Financial risk tolerance refers to the degree of uncertainty an investor is willing to accept, and can often be influenced by individual characteristics. However, personal psychological preferences play a prominent role in an investor's judgement and relationship with their finances. Limited research has been done on investors to see whether their type of personality will influence the level of risk they are willing to tolerate and ultimately the performance of their asset portfolios. Therefore, this article aids toward the contribution in understanding how personality traits can influence financial decision-making. The secondary data for this article was purposefully collected by an investment company using a quantitative questionnaire, which was electronically distributed to 600 investors within the South African market. The results of this study indicated that different personalities prefer different levels of risk. Individuals who are more open to experience, indicated a significant difference in risk tolerance levels compared to other personality types. The results for this article were comparable to previous research where only some of the personality traits play a role in investment decisions.

Keywords:

Risk tolerance, personality traits, gender, investment decisions

JEL Classification: G11, D14, D81

1. INTRODUCTION

Over the years, financial decisions and more specifically investment decisions have become more complex (Filbeck, Hatfield, Horvath, 2005). This complexity can be caused by investors' inability to always fully understand what is meant by risk. Risk is defined as an event occurring with an uncertain outcome (Head, 1967). Researchers such as Blume (1971) argue that the disagreement of the definition of risk exists based on what risk is and how risk is supposed to be measured. Risk encompasses various components, with risk tolerance being a major contributor. Risk tolerance is defined as the degree to which an individual is willing to bear uncertainty (Grable, 2000). Over time, two perspectives of risk tolerance have emerged, the one being focused on the understanding of individual choice (utility theory), and the other being the behavioural prospect theory (Filbeck et al., 2005). Individuals are often profiled in their investment portfolio according to their level of risk tolerance. The two main categories for risk tolerance are risk-averse individuals and risk-seeking individuals. Risk-averse refers to individuals who do not want to take any financial risks (Paulsen, Platt, Huettel, Brannon, 2012); whereas, risk-seeking individuals are those who prefer riskier options with greater rewards (Scholer, Zou, Fujita, Stroessner, Higgins, 2010). Individuals are more inclined to take part in financial risk-related behaviour when they possess some form of knowledge with regard to their level of risk tolerance (Borden, Lee, Serida, Collins, 2008).

Several factors influence an individual's risk tolerant behaviour, such as age, gender, ethnicity, marital status, income, education and other cognitive factors (Kuzniak & Grable, 2017). The most prevalent cognitive factor which can influence risk tolerant behaviour is an individual's personality (Weller & Tikir, 2010). Personality is defined as the unique characteristics that shape an individual's behaviour and decision-making processes (Cooper, 2003). It is argued that individuals generally display inconsistent behaviour with regard to decision-making under different circumstances (Schoemaker, 1990). Weller and Tikir (2010) state that it is important to study the influence that personality traits have on an individual's financial decision-making processes and behaviour. Research on the influence that personality traits have on risk tolerance has gained much attention over the past decade (Cobb-Clark & Schurer, 2012). Personality traits are categorised according to five main constructs, namely (i) extraversion, (ii) neuroticism, (iii) agreeableness, (iv) openness to experience, and (v) conscientiousness (Cooper, 2003; Vazifehdoust, Akbari, Charsted, 2012). The five main constructs of personality are better known as the five-factor model.

When individuals make financial decisions, both the individual and the financial advisor need to be aware of relevant personality traits as well as the level of financial risk tolerance. It is generally assumed that when individuals make financial decisions, they are thinking and acting rationally (Dickason & Ferreira, 2018). However, one of the major consequences of financial risk tolerance is the ignorance individuals tend to display towards the risk they are about to take (Dickason & Ferreira, 2018). Therefore, an understanding of their level of risk tolerance is essential. As such, the purpose of this paper is to examine the effect that personality measures have on individual financial risk tolerance.

2. LITERATURE REVIEW

In an emerging economy, individuals are often faced with uncertainty when they need to make decisions. Normally, these decisions encompass a certain degree of risk. In simple terms, risk is uncertainty (Head, 1967). Risk constitutes several subsets, with risk tolerance being one of the major factors. When explaining risk tolerance, a simple example can be used. Imagine having two investment options you can choose from. The first option is certain to give you R100, whereas the second option is a coin toss. If the coin lands on heads, you will get R100; however, if the coin lands on tails, you will get nothing (Tversky & Kahneman, 1981). Therefore, if the investor is risk averse, he will choose the first option. However, if the investor is risk seeking in nature, he will choose the second option. When the investor made his decision between the two options, he is more aware of his position on the continuum of risk averse to risk seeking. Furthermore, the investor will also better understand his degree of financial risk tolerance (Tversky & Kahneman, 1981).

The accurate measurement of risk tolerance in an investment portfolio proves to be a difficult task (Kannadhasan, Aramvalathan, Mitra, Goyal, 2016). However, the various factors, influencing risk tolerance, aid in overcoming said difficulties. Risk tolerance is influenced by a variety of factors, including, but not limited to demographic variables, financial well-being, life satisfaction as well as personality traits. Other factors include environmental and economic factors (Kannadhasan et al., 2016). Caspi, Roberts, Shiner (2005) suggest that an individual's level of risk tolerance is more stable over time than their personality traits. Furthermore, Kannadhasan et al. (2016) argue that an investor's personality traits heavily influence his decision-making processes. The five main personality traits according to the five-factor model are (i) neuroticism, (ii) extraversion, (iii) openness to experience, (iv) agreeableness, and (v) conscientiousness (Cooper, 2003; Rothmann & Coetzer, 2003; Vazifehdoost et al., 2012).

Neuroticism refers to the likelihood of individuals feeling concerned, anxious and self-doubting (Cooper, 2003). The neuroticism trait is also referred to as the emotionality factor (Myers, Sen, Alexandrov, 2010). Furthermore, this construct also refers to the individual's capability to control his desires (Vazifehdoost et al., 2012). The extraversion trait relates to the ability of the individual to be ambitious, verbose, confident, and also gregarious (Cooper, 2003). Furthermore, this trait encompasses the individual's ability to be a leader, to express his opinions, and also his positive attitudes (Vazifehdoost et al., 2012). Openness to experience refers to the individual being inquisitive, unique, inventive and sophisticated (Kaufman, 2013). This trait is also suggestive of the individual's ability to be open to new experiences, as well as his inclination to accept change (Vazifehdoost et al., 2012). Agreeableness is the trait referring to the individual being more forgiving, considerate and lenient (Cooper, 2003). Individuals possessing this personality trait tend to be more understanding and caring (Myers et al., 2010). Finally, individuals who possess the conscientiousness trait refer to their inclination of being more systematic (Cooper, 2003). This trait normally refers to individuals being more responsible, determined and organised (Myers et al., 2010).

Previous studies researching the relationship between risk tolerance and personality traits obtained homogeneous results. Grable (2000) conducted a study on financial risk tolerance and the factors influencing individual risk taking in financial decision-

making processes. Results indicate that personality factors are positively associated with risk tolerance. Zaleskiewicz (2001) conducted a study on risk taking and personality traits. His results indicate that personality traits are directly linked with an individual's risk taking behaviour, and ultimately his level of risk tolerance. Rothmann and Coetzer (2003) conducted a study where they examined job performance and the link with the five-factor personality dimensions. Their results indicate that personality factors such as openness to experience, extraversion and conscientiousness are directly associated with job performance. A study by Jylhä and Isometsä (2005) found a positive correlation between anxiety and introversion, and a negative correlation between anxiety and extraversion. Filbeck et al. (2005) conducted a study on the influence that personality traits have on risk tolerance, and obtained results indicating personality traits explain differences in individual risk tolerance. The results from this study indicated a positive correlation between extraversion and high risk taking. A significant relationship was also present for risk aversion and introversion, which can be explained by the desire for economic security by this personality group. Kannadhasan et al. (2016) conducted a study on determining whether demographic, psychosocial and environmental factors influence risk tolerance. They obtained results indicating that these mentioned factors are positively correlated with risk tolerance. Overall, there appears to be consistency across the above-mentioned studies that certain personality types are more likely to engage in high risk, while other individuals are more drawn to financial security. Individuals drawn to financial security are also expected to experience more anxiety and stress (Filbeck et al., 2005).

3. METHODOLOGY

The following sections within the methodology represent the research approach and instrument used, the sample size, formulated hypotheses and statistical analysis.

3.1 Research instrument

Similar to other studies conducted within the field of financial risk management and investment, a quantitative research method was used. The secondary data obtained for this research was gathered through electronic questionnaires that were sent to individual investors in order to evaluate the risk tolerance of these investors. Two validated scales were used for investor risk tolerance and investor personality. In order to measure personality, the five-factor model of personality traits was used (Gosling et al., 2003). The Survey of Consumer Finance (SCF) scale was used as a self-report measure on the level of financial risk tolerance. The SCF scale (four-item scale) is a comprehensive measure of investment choice, attitudes and experience. SCF scale is the only single measure of risk tolerance (Grable & Lytton, 1998).

3.2 Research sample selection

The researched population of this study was based on the clientele of a South African investment company. The clients of this investment company is distributed over the nine South African provinces. The most productive sample was included by means of purposeful sampling. Purposeful sampling was the most effective method, since it involved an identification and selection of people or groups of people who have knowledge of or experience in a phenomenon of interest (Palinkas, Horwitz, Green, Wisdom, Duan, Hoagwood, 2015). The final sample size for this study included 600 South African investors.

3.3 Sample size

An investment company in South Africa distributed the questionnaire to 3 000 of its investors. The researcher aimed to analyse a final sample size of 650. The sample included both female and male investors from all nine provinces in South Africa. A sample size of 600 participants ($n = 600$) was collected, as these participants completed the questionnaire.

3.4 Hypotheses

This study consists of the following hypotheses, which were established to achieve the primary objective:

Null hypothesis (H_0): there is no relationship between investors' personality and their risk tolerance

Alternative hypothesis (H_1): there is a relationship between investors' personality and their risk tolerance

3.5 Statistical analysis

This study conducted the statistical analysis by making use of descriptive statistics for the sample, along with cross-tabulations and regressions to evaluate the effect of investors' personality measures on their financial risk tolerance in South Africa. The equation below illustrates the probable logistic regression:

$$RT_i = \beta_0 + \beta_1 \text{Open} + \beta_2 \text{Agree} + \beta_3 \text{Extra} + \beta_4 \text{Conscience} + \beta_5 \text{Neuro} + \mu_1$$

The dependent variable was formulated by making use of the risk tolerance scale, where RT_i represents the binary dependent variable, which is the level of risk tolerance of South African investors (0 = risk averse or 1 = high risk tolerance). The equation includes β_0 , which represents the constant; $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 represents the coefficients and μ_1 represents the error term. This equation has five independent variables that were created, $\beta_1 \text{Open}$ represents the openness to experience of the investor, $\beta_2 \text{Agree}$ indicates the agreeableness of investors, $\beta_3 \text{Extra}$ is the extraversion of the investor, $\beta_4 \text{Conscience}$ represents the investor's conscientiousness, and lastly $\beta_5 \text{Neuro}$ represents the investor's neuroticism. In the following section the empirical results will be discussed and analysed.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Descriptive statistics

In Table 1, the descriptive results can be seen for the personality measures of South African investors.

Table 1: Descriptive statistics of investors with different personality measures

Personality traits	Mean	Standard deviation	Skewed statistics	Kurtosis statistics
Neuroticism	1.943	0.643	0.052	-0.586

Extraversion	2.513	0.545	-0.488	-0.915
Openness to experience	2.445	0.520	-0.028	-1.427
Agreeableness	2.093	0.367	1.113	3.425
Conscientious	2.108	0.322	2.221	4.147

The neurotic personality obtained a mean of 1.943 (std. dev. = 0.643), which is the lowest among the different personalities. The extravert and openness personalities have among the highest mean values at 2.513 (std. dev. = 0.545) and 2.445 (std. dev. = 0.520), respectively. Moreover, these two personality types also have a negatively skewed statistic, which is indicative of a negatively skewed symmetry of distribution.

4.2 Personality traits and risk tolerance of South African investors

From Table 2, a significant inverse relationship ($r=-1.28$, $p<0.01$) can be seen between the SCF scale and the neuroticism personality. As a result, the null hypothesis can be rejected and the alternative hypothesis concluded at the 5 percent significant level. On the other hand, a positive relationship was found between the SCF scale and extraversion, however this relationship was not significant ($r= 0.047$, $p>0.1$). This is contrary to that of Filbeck et al. (2005), where these authors found a significant relationship between extraversion and risk tolerance. This can be due to the different samples that was used for the respective studies. The two personality types, neuroticism and extraversion, indicated an inverse significant relationship ($r=0.264$, $p<0.01$). Openness to experience and the SCF scale has a significant relationship ($r= 0.173$, $p<0.01$) and as a result, the null hypothesis can be rejected and the alternative hypothesis concluded at the 5 percent significant level. A significant inverse relationship was found between openness to experience and neuroticism ($r=-0.080$, $P<0.1$) and a positive significant relationship between openness to experience and extraversion ($r=0.263$, $p<0.01$).

Moreover, from Table 2 a non-significant relationship was found between agreeableness and the SCF scale ($r=0.023$, $p>0.1$). In this instance, the null hypothesis can be concluded and the alternative hypothesis rejected at the 5 percent significance level. The two personality types, agreeableness and neuroticism, has a positive significant relationship ($r=0.266$, $p<0.01$) and a negative significant relationship between agreeableness and extraversion ($r=-0.088$, $p<0.05$). The relationship between agreeableness and openness to experience is a positive significant relationship ($r=0.198$, $p<0.01$). For the personality type conscientious, a positive relationship with the SCF scale ($r=0.088$, $p<0.05$) can be seen in Table 2. As a result, the null hypothesis can be rejected and the alternative hypothesis concluded at a 5 percent level of significance. This result concur with a previous study conducted by Zaleskiewicz (2001) where this author indicated that a relationship exist between risk tolerance and personality types. Conscientious and neuroticism also indicated a positive significant relationship ($r=0.270$, $p<0.01$) whereas conscientious and extraversion indicated no significant relationship ($r=-0.024$, $p>0.1$). Moreover, conscientious had a positive significant relationship with openness to experience ($r=0.094$, $p<0.05$) and with agreeableness ($r=0.252$, $p<0.01$).

Table 2: Non-parametric correlation between risk tolerance and investor personalities

		SCF scale	Neuroticism	Extraversion	Openness to experience	Agreeableness
	SCF scale	Pearson correlation	1			
		Sig. (2-tailed)				
	Neuroticism	Pearson correlation	-.128	1		
		Sig. (2-tailed)				
	Extraversion	Pearson correlation	.048	-.264	1	
		Sig. (2-tailed)				
	Openness to experience	Pearson correlation	.173	-.080	.263	1
		Sig. (2-tailed)				
	Agreeableness	Pearson correlation	.023	.266	-.088	.198
		Sig. (2-tailed)				
	Conscientious	Pearson correlation	.088	.270	-.024	.094
		Sig. (2-tailed)				

*1% level of significance; **5% level of significance; ***10% level of significance

4.3 Logistic regression analysis

Risk tolerance is the dependent variable and it was classified that investors with low risk tolerance take the value 0 and those with high risk tolerance take the value 1 and this is indicated under the dependent variable coding.

Table 3: Logistic regression of investor personality measures

Variables in the equation						
	Beta	Standard error	Wald	Df	Significance	Exponential beta
Constant	-4.578	0.905	25.592	1	0.000*	0.010
Neuroticism	-0.150	0.116	2.310	1	0.129	0.860
Extraversion	0.063	0.159	0.292	1	0.589	1.065
Openness to experience	0.513	0.139	10.376	1	0.001*	1.670
Agreeableness	0.151	0.190	1.168	1	0.280	1.163
Conscientiousness	0.301	0.905	2.524	1	0.112	1.352
Omnibus test						
Chi-square	Degree of freedom			Significance		
24.784	5			0.000		
Model summary						
Cox & Snell R-square	Nagelkerke R-square			-2 Log likelihood		
0.042	0.062			634.622		

*Significant at 1% level of significance **5% level of significance ***10% level of significance

The Hosmer and Lemeshow shows a p-value of 0.963, which was significant ($p > 0.05$). Given the p-value of the omnibus test, it is evident that this is a good model to measure the influence of personalities on risk tolerance. Subsequently, both the Cox and Snell R-square and the Nagelkerke R-square show a p-value of 0.042 and 0.062, respectively, which are significant at the 5 percent and 10 percent significance level. This indicates that the null hypothesis can be rejected, as these models contribute to the theory of investor personality and its influence on risk tolerance. The Nagelkerke R-square shows 6.2 percent of personality measures in South African investors explain their risk tolerance levels.

Table 3 is an illustration of investors' personality measures, namely neuroticism, extraversion, agreeableness, openness to experience, conscientiousness and their risk tolerance. Investors with openness to experience are more likely to be high risk tolerant; this is shown by a positive and strong coefficient (0.513, $p < 0.01$). These investors are 67 percent more likely to be high risk tolerant than to be risk averse.

Extraversion had a positive coefficient of 0.063, which illustrates that investors are 6.5 percent more likely to be risk tolerant. The p-value of an extraversion investor was not significant ($p > 0.05$); therefore, there is no statistical difference in risk tolerance between investors with an extraversion personality. This result is contrary to the results of a study conducted by Filbeck et al. (2005), where these authors found a positive relationship between extraversion and risk tolerance.

Furthermore, agreeableness also had a positive coefficient of 0.151, which illustrates that investors are 16.3 percent more likely to be risk tolerant. The p-value was not significant ($p > 0.05$) at any level of significance, and therefore there is no statistical difference in risk tolerance between South African investors with an agreeableness personality trait. These results can be expected, since investors with an agreeableness personality trait tend to be cooperative, helpful and sympatric; they

may be more flexible in terms of the amount of risk that they take on (Mayfield, Perdue, Wooten, 2008).

In addition, conscientiousness shows a positive coefficient of 0.301. Investors with a conscientiousness personality trait are 35.2 percent more likely to be risk tolerant. The p-value of a conscientious investor is 0.112, which is not significant at any level of significance, and therefore there is no statistical difference in the risk tolerance levels of conscientious investors in South Africa.

Furthermore, neuroticism shows a negative coefficient of -0.150, which illustrates that investors are less likely to be risk tolerant. This is in line with theory that indicates that these types of personalities have high levels of tenseness and anxiety. Because these individuals normally have a feeling of concern, anxiety and self-doubt (Cooper, 2003), it is probable that they would be less motivated to take on high risk and engage in risky investment options. These results are similar to Mayfield et al. (2008), who found investors with a neuroticism personality trait to be risk averse and refrain from investing in short-term investments.

4 CONCLUSION

Risk tolerance refers to the degree of uncertainty an investor is willing to bear with regard to their financial decision-making processes. It is generally assumed that investors make decisions rationally. However, several factors influence the investor's financial decision-making processes. These factors range from demographic characteristics to cognitive characteristics. Similar to other psychological preferences, personality measures can also influence the investor's financial decision making process. Furthermore, the above-mentioned factors also influence the investors' degree of financial risk tolerance. The main aim of this study was to determine whether personality traits can possibly influence the level of risk an investor is willing to tolerate. Ultimately, this study investigated the influence of personality traits on financial decision-making.

It can be concluded from this study that investors who have the openness to experience personality trait are more likely to be high risk tolerant and are likely to invest optimistically. On the contrary, investors leaning towards the neurotic personality trait tend to display high levels of tenseness and anxiety and these individuals also have lower levels of risk tolerance. The findings from this research concur with research conducted by other international researchers. This study further concludes that investment firms can option higher risk investment products to individuals with the openness to experience personality trait. By taking an individual investors personality traits into account, investment companies can also determine the level of accuracy in individual investors' financial decisions. More accurate and calculated investment decisions will lead to higher investment returns for individuals. It is furthermore recommended that this model is applied to more investment companies not just in South Africa, but also internationally. This research article also made use of a single personality scale. It is therefore recommended to include other psychological preferences or measures which may have an effect. This inclusion may contribute to more accurate investor risk profiling.

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