ZANDRI KOEKEMOER
North West University, South Africa

THE INFLUENCE OF THE LEVEL OF EDUCATION ON INVESTORS RISK TOLERANCE LEVEL

Abstract:

Increased attention is being given to the influencethat demographic factors have on financial risk tolerance. Financial risk tolerance is the overall amount of uncertainty an investor is willing to take with regard to his/herinvestment decisions. The aim of this article was to investigate whether an investor's level of education plays a role in the level of financial risk that they are willing to tolerate.Data for this article was purposefully collected using a quantitative questionnaire thatwas electronically distributed to 600 investors within the South African market. Previous research suggests thata positive relationship exists between the level of education and risk tolerance. In other words, an investor with a higher level of education will be willing to tolerate more financial risk due to being able to take more calculated financial risks. The results of this study indicated similar findings to previous research wherean individual with a postgraduate degree was more likely to be high risk tolerant compared to an individual with a lower level of education. Individuals who had some level of schooling were more likely to be risk adverse.

Keywords:

Risk tolerance, education level, financial decisions, demographics

JEL Classification: A23, I22, G11

1. Introduction

In everyday situations, individuals are faced with important financial decisions. These decisions include some extent of risk. Risk is defined as having an uncertain outcome from participating in an event (Head, 1967). Risk can be influenced by various factors, with risk tolerance being one of the most prominent factors. Risk tolerance has been the focus of financial management research for many years. Researchers aim to determine the effect that demographic, socio-economic and psychological factors have on risk tolerance (Van de Venter &Michayluk, 2009). However, to assess the effect these factors have on risk tolerance, the concept thereof must first be understood. Risk tolerance is simply defined as an individual's inclination to bear risk (Hallahan, Faff, McKenzie, 2004). Furthermore, the definition of risk tolerance is expanded as the inclination of an individual to participate in events where the outcome is uncertain, and associated with a probable negative outcome(Irwin, 1993; Keil, Wallace, Turk, Dixon-Randall,Nulden, 2000; Chaulk, Johnson,Bulcroft, 2003; Grable, Lytton,O'Niell,2004).

Individuals'degree of financial risk tolerance influences their decisions to include certain assets in their portfolio composition (Hallahanet al., 2004). Furthermore, it is suggested that financial risk tolerance is one of the main factors influencing an individual's decisions for his/herstrategies in attaining their goals, security choices, and asset allocation selections (Fisher & Yao, 2017).Hemrajani and Sharma (2018) suggest that financial risk tolerance differs from one individual to the next based on numerous influential. Jacobs-Lawson and Hershey (2005) state that investors who have higher levels of financial risk tolerance tend to invest in high risk options. On the other hand, investors with a lower risk tolerance level will invest in more conservative investment options. However, choosing between investment options can be challenging due to the ignorance investors display towards risk when they make their investment decisions(Dickason & Ferreira, 2018).

Literature suggests that demographic characteristics influence an individual's level of financial risk tolerance (Gibson, Michayluk,Van de Venter, 2013). Increased attention is paid to certain factors influencing investor risk tolerance levels; these factors are age, gender, level of education, income and marital status (Faff, Mulino, Chai, 2008). As such, the purpose of this study is to examine the influencethat different levels of education have on an individual's financial risk tolerance.

2. Literature review

Before one can fully understand the term risk tolerance, it is important to be aware of one's position on the spectrum of risk tolerance. Risk tolerance can be classified into two main groups, namely risk aversion and risk seeking. Risk aversion refers to investors who prefer safer investment options, thereby steering away from taking risks (Paulsen, Platt, Huettel,Brannon,2012);whereas, investors who are risk seeking

tend to prefer riskier investment options (Scholer, Zou, Fujita, Stroessner, Higgins, 2010). It is suggested that investors tend to become more risk seeking if they have suffered a financial loss (Scholeret al., 2010). A third category on the spectrum exists, and is known as risk neutral. Investors who are risk neutral will base their investment decisions on the return they will receive from their investment (Larkin, Lucey, Mulholland, 2013). Once investorsare aware of their position on the spectrum, they will be able to better understand their level of risk tolerance.

Financial risk tolerance is the overall amount of uncertainty an investor is willing to take with regard to his/herinvestment decisions (Grable, 2000). Investors are constantly faced with making decisions involving their risk tolerance levels. These decisions include decisions on different investment products, their asset allocation strategies, and their fund accumulation strategies(Dickason & Ferreira, 2018). Furthermore, investors need to decide on the amount of risk they are willing to bear in terms of their investments. These different decisions relating to investment choices and amount of risk the investor is willing to take on, bring to light factors influencing the investor's level of financial risk tolerance.

An investor's level of formal education is one of the main factors influencing their level of risk tolerance, where formal education refers to the investor who has completed formal academic training (Grable, 1997). Generally, higher levels of education are associated with higher levels of financial risk tolerance (Sung & Hanna, 1996; Grable, 1997; Grable &Joo, 2004; Larkin et al., 2013). Furthermore, it is suggested that investors who have higher levels of education tend to be more risk tolerant in their investment decisions (Hallahan et al., 2003). The positive relationship between investors' level of education and their level of financial risk tolerance can be attributed to their need for a better understanding of the risks involved in investment decisions (Yao &Hanna, 2005).Hallahan et al. (2003) are of the opinion that investors' level of financial risk tolerance influences their ability to take financial risks.

Several studies examining the effects of level of education as a factor influencing risk tolerance exist. Grable (1997) argues that investors who possess higher levels of education are better equipped to make financial decisions than individuals with lower levels of education. MacCrimmon and Wehrung (1986) suggest that higher levels of education encourage individuals to take more risks financially. An investor's level of education increases his/herability to assess risk associated with different events (Hallahan et al., 2004). As such, higher levels of education arepositively associated with higher levels of financial risk tolerance (Hallahan et al., 2004).

Numerous researchers have found that individuals with higher levels of education are considered to be more risk tolerant and are able to more accurately analyse investment risks and returns compared with those individuals with lower levels of education (Baker &Haslem, 1974; Hawley &Fujji, 1993; Haliassos&Bertaut, 1995;

2

Sung & Hanna, 1996; Grable, 1997; Grable &Joo, 1999; Grable, 2000; Grable &Joo, 2004; Hallahan et al., 2004, Ardehaliet al., 2005; Grable &Roszkowski, 2007).

Grable (1997) conducted a study on investors' risk tolerance and the influence of demographic factors. Results indicate that higher levels of education and gender are the most prominent factors in differentiating levels of investor risk tolerance.

Halek and Eisenhauer (2001) as well as Grable (2016) found that individuals who obtained an undergraduate degree or higher are believed to be the most risk tolerant. On the other hand, individuals with lower education such as those with a matric diploma or less are considered to be highly risk adverse. Grable and Joo (2004) conducted a study on factors that are associated with the risk tolerance levels of investors. The results from the before mentioned are in line with the results of other studies, and indicate that education level and financial risk tolerance level have a positive relationship. However, Grable and Joo(2004) expanded on their results by indicating that further research needs to be conducted in order to determine the full effect that demographic factors and biopsychosocial factors have on financial risk tolerance. Grable and Roszkowski (2007) conducted a study on the self-assessment of risk tolerance of men and women. Results indicate that a positive relationship between investor risk tolerance levels and education levels exists. Furthermore, Faffet al. (2008) conducted a study on the link between an investor's level of risk tolerance and risk aversion. Results indicate that investors' financial risk tolerance increases as their level of education increases. These results were confirmed by van Schalkwyk (2012), who also found individuals with undergraduate, honours, master's and doctoral degrees to be more likely to be risk tolerant than individuals with grade 12 or diplomas within the South African context.Gibson et al. (2013) conducted a study on risk tolerance and the effect of unexplored factors. Results indicate that higher levels of financial risk tolerance aredirectly associated with higher levels of education (Gibson et al., 2013).

Although many researchers obtain results indicating that an investor's risk tolerance increases as their education increases, some researchers find results indicating otherwise. Sung and Hanna (1996) conducted a study on the factors associated with risk tolerance. Results obtained indicate that the differences in investor risk tolerance could be attributed to the investor's understanding of what risk is. McInish (1982) conducted a study on investors and their risk-taking. Although literature suggested a positive relationship between risk tolerance and education, the study obtained results wherein none of the coefficients of education were statistically significant, in any regression.

3. Methodology

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

3.1.   Research instrument

In this research, a quantitative research method was used. The questionnaire that was used to collectdata consisted of two sections. The first section of the questionnaire was designed to gather demographic information of the individual investors. From the information gathered in the first section, information on education was used for purpose of this research. The second section focused on risk tolerance and used the survey of the Survey of Consumer Finance (SCF),where a single risk tolerance question (self-report measure) was used. The question that was used to understand investors' level of risk tolerance was stated as follows: "Which of the following statements comes closest to the amount of financial risk that you and your(husband/wife/partner) are willing to take when you save or make investments?" The options that were made available for the investors to choose from were:

1. Take substantial financial risks, expecting to earn substantial returns.
2. Take above average financial risks, expecting to earn above average returns.
3. Take average financial risks, expecting to earn average returns.
4. Not willing to take any financial risks.

Based on the risk tolerance question that investors were asked, they had to choose the option that best described their attitude towards risk. Options one and two were classified asbeing highly risk tolerant,while options three and four were classified as beingless risk tolerant (Dickason & Ferreira, 2018).

3.2   Research sample selection

The target population for this study consisted of all South African investors, since research into this group is invaluable due to limited research on this target population. A South African investment company granted gatekeeper permission for the collection of data using the company's client base. The sample was selected by aid of the simple random sampling technique.Simple random is known where a complete list of the members of a population could be drawn at random, where each investor had the same probability of being selected (Banerjee, 2012). A sample of 600 participants (n = 600) was selected where participants partook in an online questionnaire out of their own free will.

When analysing the sample in Figure 1, it was found that the majority of participants had a diploma (33.7%), followed by the number of participants with a postgraduate degree (24.2%). A large number of participants also had a matric certificate (23.3%) while 3.5 per cent had some level of schooling (did not finish matric).

Figure 1: Sample education level
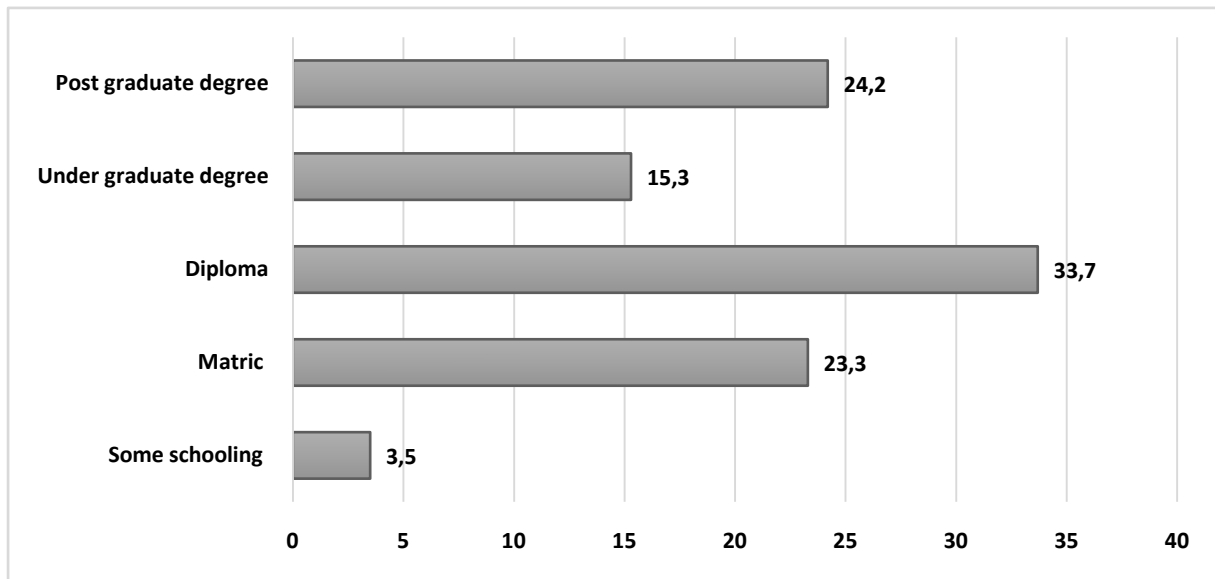
When analysing the sample in Figure 2,based on their risk tolerance level, it was found that the majority of the sample were found to be risk adverse (74.53%), whereas the remaining quarter of the sample (25.47%) were found to have a higher attitude towards risk (high risk tolerant).

Figure 2: Sample risk tolerance level
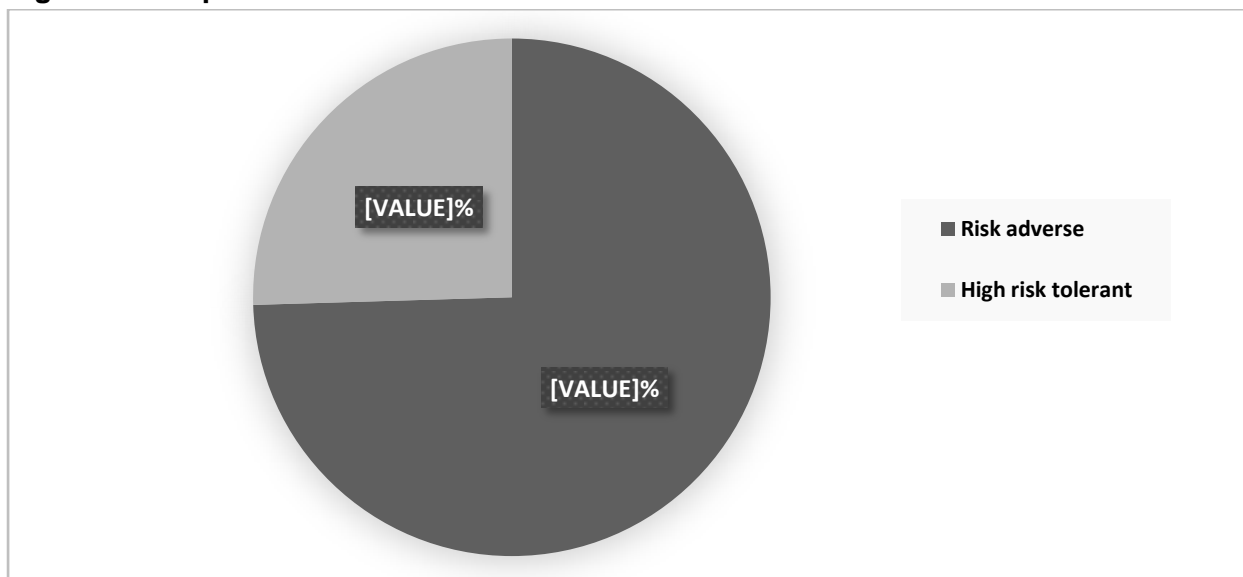
The following section describes the hypothesis and statistical methods that were applied to the study.

3.3 Hypothesis

Different researchers, who have conducted research in the past regarding the influence of the level of education on individual investors' willingness to take risks, found that there was a relationship (Rahmawati, Kumar, Kumuaya, Jamil,

5

Muneer,2015). The following hypothesis was constructed to fulfil the primary objective of this research.

Null hypothesis (H_o): risk tolerance of education group 1 = risk tolerance of education group 2.

Alternative hypothesis (H_α): risk tolerance of education group 1 ≠ risk tolerance of education group 2.

The abovementioned hypotheses propose that there is no relationship between the level of education that individual investors have and the level of risk that they are willing to take on their investments.

3.4 Statistical analysis

In this research article, a cross-tabulation and logistic regressionwereused to examine the influence of education level on individual investors' risk tolerance. The binary logistic regression is presented in the following equation:

$$SCFi = \beta o + \beta_1 EDU + \mu_1 \qquad (1)$$

The SCF risk tolerance question was used to establish the dichotomousdependent variable. $SCFi$ is used to show the dependent variable, which represents the level of risk that individual investors from South Africa are willing to tolerate; 1 indicates investors who would take high risks, while 0 indicates those who are risk averse. Education is one of many factors that have an influence on investors' risk tolerance. The equation entails the following: βo thatis the constant, β_1 is the coefficient and μ_1 provides the error term. There is one independent variable that was created, namely β_1EDU for education (1=some schooling, 2=matric, 3=diploma, 4=undergraduate degree, 5=postgraduate degree).

4. Empirical results and discussion

Table 1: Relationship between education level and risk tolerance

Highest level of education	Risk adverse		High risk tolerant
Some schooling	77.8%		22.2%
Matric	81.5%		18.5%
Diploma	80.1%		19.9%
Undergraduate degree	70.0%		30.0%
Postgraduate degree	62.7%		37.3%
	Value	**df**	**Asymptotic significance (2-sided)**
Pearson chi-square	18.225[a]	4	0.001***

Likelihood ratio	17.778	4	0.001
Linear-by-linear association	14.017	1	0.000
N of valid cases	581		

Table 1 indicates the relationship between education level and risk tolerance of investors. Participants who indicated that they had some level of schooling (77.8%) were risk averse, while 22.2 percent were high risk tolerant. For participants who had matric as their highest level of education, 81.5 percent were risk averse, while 18.5 percent were high risk tolerant. 80.1 per cent of participants had indicateda diploma as their highest level of education and were risk averse, while 19.9 percentwere high risk takers. The majority of participants (70.0%) with undergraduate degrees were risk averse, while 30 per cent were high risk tolerant. For participants who hada postgraduate degree,62.7 percent were risk averse and 37.3 percent were high risk tolerant. From the results obtained in Table 1, it is evident that investors with the highest level of education have the highest percentage of high risk tolerance. These results are in line with the conclusion made byGustafsson andOmark (2015) that the higher the level of education investors have, the higher the risk they are willing to take.Sulaiman (2012) also found in his research that the higher the level of education investors have, the higher the risk they are willing to take. A Pearson chi-square value of 18.225 was found, which was significant at the 1 percent confidence level. Therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_α) is accepted. These results therefore suggest that there is a relationship between the level of education and the level of risk individual investors are willing to take.

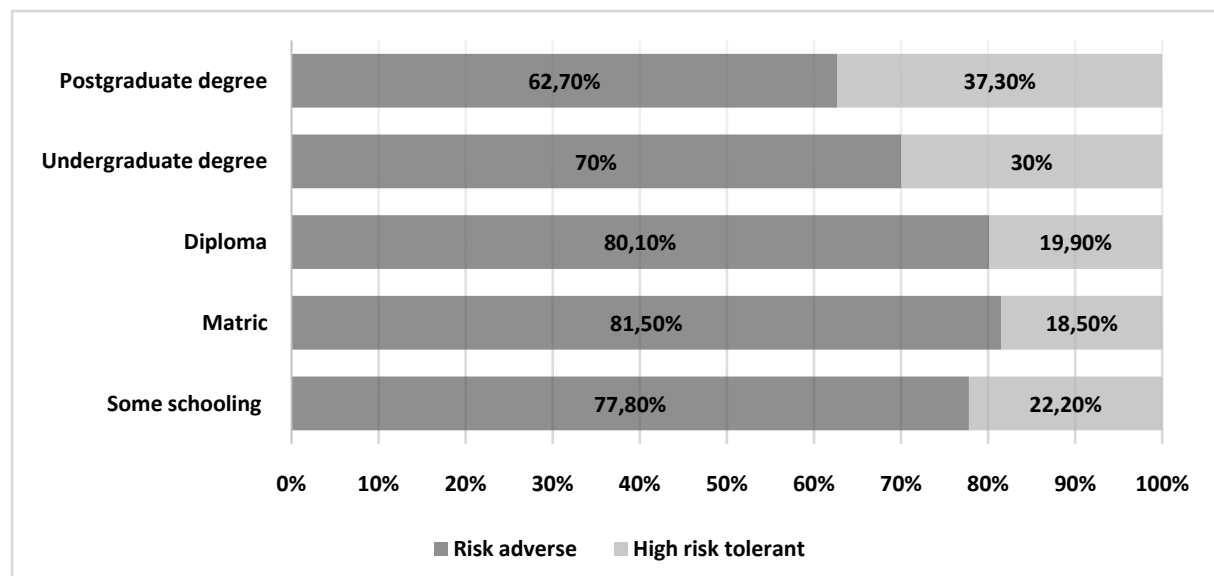**Figure 3: Risk tolerance distribution based on education level**

Figure 3illustratesthat the majority of participants were risk averse. A large portion of investorswith a postgraduate degree were risk aggressive, while the largest portion of investors with a matric diploma were risk adverse.

4.1.   Regression analysis

The Omnibus test for model coefficients has a p-value of 0.001, which is statistically significant at a 5 percent significant level, which indicates that the current model outperforms the null model. This indicates that the model is significant and is a good fit. The model summary had a Nagelkerke R-square value of 0.044, suggesting that 4.4 percent of the model coefficient explains the variation of the level of risk that individual investors are willing to take. This result can be explained by the number of independent variables used. Furthermore, the classification table indicated an overall accuracy rate of 74.5 for predicting the number of participants who are risk averse and those who would take high risks.

Table 2: Regression results of investor risk tolerance and education level

	B	S.E.	Wald	df	Sig.	Exp(B)
Postgraduate degree			17.740	4	*0.001	
Some schooling	-0.734	0.593	1.534	1	0.215	0.480
Matric	-0.963	0.281	11.716	1	*0.001	0.382
Diploma	-0.874	0.249	12.307	1	*0.000	0.417
Undergraduate degree	-0.329	0.288	1.304	1	0.254	0.720
Constant	-0.518	0.174	8.925	1	*0.003	0.596
-2 log likelihood				**Omnibus**	17.778	
Nagelkerke R-squared		0.044		**P-value**	*0.000	

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

Considering Table 2, the dominant sign for the logistic regression was negative, which indicates that investors are more likely to be risk adverse and less likely to be risk tolerant. Investors with some level of schooling were found to be 52 percent (odds ratio 1-0.480) less likely to be high risk tolerant. The result for investors with some level of schooling were not significant, and thereforethe null-hypothesis can be concluded. Investors with a matric also had a negative beta coefficient (-0.963),which was significant at the 1 percent confidence level (p<0.01). Investors with a diploma will also be 58.3 percent (1-0.417) less likely to be high risk tolerant. Investors with a matric were also found to be less likely (61.8%) to fall in the high risk tolerant category. A negative coefficient was again found for investors with a diploma; however, the result was significant at the 1 percent confidence level (p<0.01). This group of investors will be less likely to be high risk tolerant and more likely to be risk adverse. For this category of investors, the null-hypothesis can be rejected. Lastly, for individuals with an undergraduate degree,a negative beta (-0.329) was found; however, the p-value was not significant at 1 percent. When considering the odds ratio, these investors will be 41 percent less likely to be high risk tolerant compared to the other level of education groups. The results for this article were similar to previous and older research studies (Baker &Haslem, 1974;

8

Hawley &Fujji, 1993; Haliassos&Bertaut, 1995; Sung & Hanna, 1996; Grable, 1997; Grable &Joo, 1999; Grable, 2000).

The results found in the binary regression were also similar to more recent studies, such as those of Halek and Eisenhauer (2001) as well as Grable (2016), who found that individuals who obtained an undergraduate degree or higher are believed to be the most risk tolerant. Similar to this research article, individuals with lower education such as those with a matric diploma or less were also considered to be highly risk adverse. This article's results,within a South African context, are also confirmed by van Schalkwyk (2012), who also found individuals with undergraduate, honours, master's and doctoral degrees to be more likely to be risk tolerant than individuals with grade 12 or diplomas within the South African context.

5. Conclusion

Risk tolerance refers to the amount of uncertainty an investor is willing to bear in term of financial decisions. Investors need to be aware of their position on the spectrum of risk tolerance (from risk aversion to risk seeking) for them to have a better understanding of their level of risk tolerance. The investor's risk tolerance is influenced by a variety of factors, with education levels being a prominent factor. The relationship between risk tolerance and the investor's level of education is expected to be positive, as suggested by literature. Investors with a matric or a diploma were found to be significantly different from the other education groups. These two education levels were significantly less likely to be high risk tolerant compared to the other levels of education. Investors with an undergraduate degree or postgraduate degree were found to be more risk tolerant when considering financial decisions. When constructing an investment portfolio, investment firms can option higher risk investment products to individuals with an undergraduate degree and upwards. By taking an individual investors level of education 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, which can ultimately transition into a higher level of financial well-being for investors. It is furthermore recommended that this model is applied to more investment companies to compare results within all investment firms in South Africa. This research article also made use of a single demographic factor to isolate the effects on investor financial risk tolerance. It is therefore recommended to include all demographic variables to determine which factors will have an effect. This inclusion may contribute to more accurate investor risk profiling.

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