Foundations of Management, Vol. 10 (2018), ISSN 2080-7279
DOI: 10.2478/fman-2018-0023

DETERMINANTS OF FINANCIAL AND NON-FINANCIAL RISK TOLERANCE AMONG STUDENTS AT SELECTED SOUTH AFRICAN UNIVERSITIES

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Abstract: To enhance the portfolio allocation process, individuals need to understand their financial ability and psychological willingness to tolerate risks. To do this, their risk tolerance level must be quantified. This study used a survey questionnaire to collect data from 470 students at selected South African universities, and a binary logistic regression to test the effect of demographic factors on financial risk tolerance versus non-financial risk tolerance. Our findings suggest that the level of risk tolerance cannot be generalized across different risk domains. We also found that demographic factors affect the two domains of risk tolerance differently. Specifically, age did not have a significant influence on financial risk tolerance, while it significantly increased non-financial risk tolerance. Similarly, gender did not have any significant influence on non-financial risk tolerance, while it positively affected financial risk tolerance. Furthermore, students in the fields of the humanities, engineering and IT showed a strong appetite for non-financial risks, but students in the commerce faculty preferred financial risks.

***Keywords*:** risk tolerance, financial risk tolerant, non-financial risk tolerant, demographic factors.

JEL: D14, G40.

1 Introduction

As human beings we encounter and engage in multiple risk taking situations on a daily basis throughout our lives. These risks that we encounter can be classified into various risk domains. Weber, et al. (2002) referred to the financial, recreational, health/safety, social, and ethical domains as the five major risk domains. Similarly, Nicholson, et al. (2006) defined six different risk domains of health, recreation, finance, career, society, and safety.

Regardless of their domain, some risks are completely avoidable and can easily be minimized or transferred (Nicholson, et al., 2006). It is, however, common for certain individuals to engage in certain risky activities by actively seeking out risks. This is usually either because these individuals have the necessary experience, capacity, and skills to deal with such risks, or because they are simply looking for the reward that comes with the risks (Grable and Rabbani, 2014).

As might be expected, decisions related to participating in particular activities are often shaped by the individual's unique experiences, preferences, perceptions, and risk taking attitudes (Grable and Rabbani, 2014). People thus differ in their ways of approaching situations that involve risks and uncertainties, and these differences are often described as variances in risk taking attitudes (Blais and Weber, 2006). However, it is not clear whether risk taking attitudes differ across the various risk domains, especially when comparing the financial and the non-financial domains (Grable and Rabbani, 2014).

Griesdorn, et al. (2014) noted that financial risks are often a central topic of concern for most individuals and households; however, it is still vital that counseling and planning practitioners have both an abstract and a practical understanding of the concepts relating to both non-financial and financial risk taking. Of the five domains listed by Weber, et al. (2002), the recreational, health/safety, social, and ethical domains can collectively be classified as general/non-financial risk domains.

Health, career, social, safety and recreational risks, as listed by Nicholson, et al. (2006), can also be classified as general/non-financial risks. Non-financial

risks are thus broadly defined as the probability of damage, injury, loss, liability or any other negative non-monetary occurrences due to external vulnerabilities that are usually avoidable through preventive actions (Weber, et al., 2002). Such risks can be threats to one's health, career, social status, moral principles, or physical wellbeing. According to the Canadian Centre for Occupational Health and Safety (CCOHS) (2016), non-financial risks are risks of being harmed, incapacitated, or injured, or experiencing an adverse health effect, when exposed to a hazard.

The possibilities of developing cancer from smoking or of breaking a leg in a car accident are examples of non-financial risks. Financial risk, on the other hand, refers to the probability that the returns on an investment are lower than expected because of investment fluctuations (Ryack, 2011). This domain of risk can be divided into income risk, speculative risk, investment risk, and, sometimes, entrepreneurial risk (Marx, 2010). The most important aspect of financial risk is that it involves the possibility of losing money, be that because of saving decisions, gambling, investing, or lending or borrowing money (Marx, 2010).

For both financial and non-financial risks, individuals usually choose to take, or not to take, the risks on the basis of their tolerance levels. Risk tolerance normally refers to an individual's willingness to partake in behavior for which one or more outcomes are uncertain and potentially negative (Grable and Joo, 2004). Risk tolerance can also refer to an individual's ability to withstand irregularities and uncertainties either in his/her finances or in his/her non-monetary daily life (Pieson, 2012). Risk tolerance therefore measures how far individuals are willing to stretch their possibilities of harm/injury or monetary loss when pursuing their goals and objectives (Pieson, 2012).

There are two schools of thought when it comes to risk tolerance. There are those who suggest and believe that risk tolerance is domain dependent (Slovic, 1964; Corter and Chen, 2006). Domain dependent risk tolerance refers to the idea that individuals tend to have different responses and risk tolerance levels depending on the dilemma or risk they are facing. In particular, the domain dependent school of thought emphasizes that an average individual shows different risk tolerance attitudes to every risk he or she encounters, without any traceable general representation of risk tolerance across risk domains. In support of the domain dependent school of thought, Corter and Chen (2006) argued that individuals may appear to be very conservative in some areas of their lives, but exhibit very high risk tolerances in other areas. An example would be an individual who is reluctant to invest in high risk investments, yet eager to engage in risky recreational activities such as skydiving.

The second school of thought, supported by Zuckerman (1994) and Zuckerman and Kuhlman (2000), argues that individuals may not be universally risk averse (or risk tolerant) in all areas of their lives, but tend to be characterized by a general representation of risk tolerance. This school of thought simply argues that, on average, individuals will exhibit consistent risk tolerance attitudes across a wide variety of domains (Zuckerman and Kuhlman, 2000).

Regardless of which school of thought is followed, risk tolerance is dependent on three important components (Callan and Johnson, 2002). The first component is willingness to take risk, which speaks to an individual's psychological preparedness to be exposed to risk. Some individuals love and enjoy the prospect of uncertainty, making them more willing to participate in risky activities (Loomes and Sugden, 1982). Others, on the other hand, may find the prospect of taking a risk distressing, and are thus likely to assume relatively fewer risks (Loomes and Sugden, 1982).

The second component of risk tolerance is the ability to tolerate risk. This refers to the capacity, power, and means to assume risks (Roszkowski, et al., 2004). For example, a disabled person might be willing to take the risk of skydiving but, because of his disability, he may be unable to do so. Similarly, someone might be interested in investing in high risk investments, and willing to do so, but lack the financial ability. Lastly, the need to take risks completes the three risk tolerance components; this speaks to the specific goals and objectives driving an individual to expose himself or herself to risky behavior.

When measuring risk tolerance levels, there are two important types of measure, namely subjective and

objective measures. A subjective risk tolerance measure assesses an individual's self-perceived risk tolerance, and is rooted in the economic concept of risk aversion (Chang, et al., 2004). Subjective risk tolerance therefore considers the psychological component of risk taking, and is largely affected by judgments, attitudes, feelings, perceptions, and opinions (Chaulk, et al., 2003). It varies with individuals and is not static, as it changes all the time especially as economic and demographic factors are altered (Chang, et al., 2004). Whilst this study focuses on subjective risk tolerance measures, objective measures look at an individual's revealed behavior. Thus, it is based on the idea of the objective financial situation of a household and is more concerned about revealed or actual allocations than attitudes and opinions (Hanna and Chang, 1997).

Despite the debate on the generalization of risk tolerance across risk domains, some financial institutions tend to use non-financial risk measures to draw inferences on the financial risk tolerance or aversion of their customers. This method is, however, disputed by the afore-explained domain dependent school of thought (Corter and Chen, 2006). The purpose of this study is therefore to determine whether the domain dependent school of thought or the domain general school of thought is correct for a sample of students from different disciplines. The objective is to determine if risk tolerant individuals are tolerant of both financial risks and non-financial risks, or if individuals tend to be risk tolerant for financial risks and risk averse for non-financial risks, or the other way around.

Additionally, this study investigates the extent to which age, gender, and education explain individuals' risk tolerance levels for financial and non-financial risks. The findings of this study are important in indicating whether the general attitude towards risk can be used to measure financial risk tolerance.

2 Brief review of empirical studies

Strongly rooted in the Hindu-Arabic numbering system, the study of risk tolerance is not new and has been of interest to academic researchers for hundreds of years. Various researchers (Weagley and Gannon, 1991; Sung and Hanna, 1996; Weber, et al., 2002; Strydom, et al., 2009) have used different methods and samples to meet their research objectives of quantifying risk tolerance. However, research into risk tolerance has been limited in relation to enhancing decision making, especially in a South African context.

Many researchers (Bakshi and Chen, 1994; Grable and Lytton, 1998; Faff, et al., 2008; Strydom and Metherell, 2012) have focused on demographic factors such as age, gender, income, and level of education, while completely disregarding the effect of type of education on risk tolerance. Student samples, as opposed to other structured samples, have also received relatively less attention from researchers. Notably, the work by Grable and Lytton (1999, 2004) has been ground breaking in this field of study, going as far as creating a standardized measure of risk tolerance.

Other notable studies include that of Bakshi and Chen (1994), who examined the life-cycle risk aversion hypothesis and concluded that risk tolerance decreases with age. Similarly, Grable and Lytton (1998) concluded that, over the life cycle, risk tolerance declines with age. Sung and Hanna (1996) used a Federal Reserve Board survey on employed participants between the ages of 16 and 70. In contrast to the results mentioned above, they found that age has no significant effect on financial risk tolerance; suggesting that the effect of some of the demographic results cannot be generalized. Using a binary logistic regression model, Strydom and Metherell (2012) found, for their sample of 320 students at a South African university, that age had a negative impact on risk tolerance.

Other studies (Weagley and Gannon, 1991; Riley and Chow, 1992; Faff, et al., 2008; Gilliam, et al., 2010), although not using student samples, discovered a curvilinear relationship between age and risk tolerance, such that risk tolerance increases with age up to a certain point but then starts to decrease as age increases. This suggests that the effect of age on risk tolerance is dynamic and cannot be generalized.

Research on the effect of gender on risk tolerance has been widespread. Generally, men are deemed to be more risk tolerant than women. Using student samples, Strydom, et al. (2009), Yao, et al. (2011),

Strydom and Metherell (2012), and Ramudzuli and Muzindutsi (2015) found men to be more tolerant of risks than women. However, these studies only focused on financial risk tolerance. To date, the extent to which gender differences represent evidence of general traits rather than contextual responses to social and environmental factors is still unresolved.

Education, on the other hand, is considered to be a factor that influences an individual's willingness to take risk. Researchers (Hammond, et al., 1967; Gilliam et al., 2010; Chaulk, et al., 2013; Larkin, et al., 2013) found that people with higher education usually show greater risk tolerance than others. This has been attributed to the notion that a formal academic training allows an individual to assess risks and benefits more accurately, therefore improving his/her risk taking attitude. In contrast, Hallahan, et al. (2004) found that education was not a significant determinant of a person's risk tolerance behavior.

However, these findings have created an increased interest in including education as a variable to explain risk tolerance. When it comes to financial risk tolerance, we argue that the type of education should be given more consideration than the level of education. For example, an individual with an educational background in finance would understand the impact of taking more financial risk, and this would influence his/her financial risk tolerance. Thus, the effect of financial education on risk tolerance should be investigated.

3 Methodology

3.1 Research instruments and procedure

A combination of both explanatory and descriptive quantitative research methods was employed, with a questionnaire used for the empirical portion of the study. The questionnaire was developed from a comprehensive review of the Grable and Lytton (1999, 2004) questionnaire together with the Hanna and Lindamood (2004) questionnaire. Questions were selected from the two questionnaires as seen fit for the study at hand. Some of the questions were also rephrased using simple words, to ensure that participants understood what was being asked; this was mainly to accommodate students who were not studying finance subjects and who might have found it difficult to understand financial terms.

The final questionnaire also proved easy to relate to, as the questions were made specific for the population being studied. For example, instead of requiring income data from the participants as the Hanna and Lindamood (2004) questionnaire does, the participants in this study were asked to give details of their allowances, which it is easy for students to do.

With three major sections, the final questionnaire captured basic demographics in section one, non-financial risk tolerance levels in section two, and financial risk tolerance levels in section three. The questions used in sections two and three were multiple choice questions, requiring participants to choose the one option that related to them. Depending on the question, each participant had three to five options per question.

3.2 Description of the sampled participants

The targeted population for this study was all students (male and female) registered at selected South African universities in commerce courses (economics, accounting, business management & marketing, etc.), humanities courses (education, law, psychology, etc.) and engineering and IT courses, for the academic year 2016. Using a self-administered questionnaire, data were collected from 500 randomly sent questionnaires. A description of the participants is summarized in Table 1.

Of the 500 questionnaires that were sent out, 470 (94%) were deemed usable, with 239 (50.85%) from female participants and 231 (49.15%) from male participants. As represented in Table 1, the age of the participants was divided into four categories: 18 years old or younger (22.5%), between 19 and 21 years (28.30%), between 22 and 24 years (27.87%), and 25 years and older (21.28%).

The education of the participants was split into two sub-classes, namely education level and subject studied. Level of education was measured by identifying the year of study of the participant.

In total, there were 120 first year, 76 second year, 156 third year and 118 postgraduate students. For the subject, the field of study of the participant was used. Of the 470 participants, 198 were studying commerce, 103 engineering and IT studies, and 169 humanities courses.

Table 1. Description of participants

Variable	Category	Frequency	Percentage in variable
Gender	Male	231	49%
	Female	239	51%
Age	18 or younger	106	23%
	19-21	133	28%
	22-24	131	28%
	25 or older	100	21%
Level of education	1st year	120	26%
	2nd year	76	16%
	3rd year	156	33%
	Postgrad	118	25%
Field of study	Commerce	198	42%
	Engineering & IT	103	22%
	Humanity	169	36%

3.3 Risk tolerance score and model specification

Apart from the descriptive analysis, this study employed a binary logistic regression model, which had a dependent variable of a dichotomous nature and many independent variables each with its own hypothesis. For each individual participant, a risk tolerance score (RTS) was calculated and compared to the average score, to classify participants as either risk averse (RA) or risk tolerant (RT). The risk tolerance scores were calculated from an absolute value assigned to each option in the multiple-choice questions, depending on its riskiness, with high risk options assigned a higher value than lower risk options.

The RTS was generated by adding up an individual's total score for each question in the questionnaire. Adding up the total score for the whole sample and calculating the average then gave a basis upon which those with a total score below the average score were classified as risk averse and those with scores above the sample average as risk tolerant (Grable and Lytton, 1999). Thus the participants were classified as either RT or RA based on their risk tolerance levels generated using the Grable and Lytton (2004) risk tolerance scoring method.

Two logistic regressions with two different dependent variables (financial risk tolerance and non-financial risk tolerance) were estimated. For both logistic regressions, the dependent variable took the value of 1 for a risk tolerant participant and 0 for a risk averse participant. The binary logistic regression models were expressed in a linear form by a latent variable Y^* as follows:

$$Y_i^* = \Sigma\beta X_i + u_i \quad (1)$$

where X_i represents a set of demographic factors used to determine an individual's risk tolerance status, β^ represents the coefficients $(\beta_1, \beta_2, \ldots \beta_n)$, and u_i represents the error term. Since Y^* is a latent variable and thus not observable, an event represented by a dummy variable Y is then observed as:

$$Y=1 \text{ if } Y^* > 0 \text{ and } Y=0 \text{ otherwise} \quad (2)$$

From equations (1) and (2) above, the probability of being risk tolerant is as follows for both regression models:

$$\text{Prob}(Y_i = 1) = F(\beta X_i)$$
$$\text{Prob}(Y_i = 0) = 1 - F(\beta X_i) \quad (3)$$

A cumulative distribution function of these probabilities eventually generates the regression model, expressed as follows:

$$E(Y_i|X_i) = \Sigma Y_i \, Prob(Y_i|X_i) \text{ for } Y_i = 0, 1 = [0 \text{ x } Prob(Y_i = 0|X_i)] + [1 \text{ x } Prob(Y_i = 1|X_i)] = Prob(Y_i = 1|X_i) \quad (4)$$

This is similar to the probability that a participant is risk tolerant in each of the regressions in equation (3) and can be written as follows:

$$Prob(Y_i = 1) = F(\beta X_i) \text{ such that } 0 \leq F(\beta X_i) \leq 1 \quad (5)$$

This is a logistic distribution (logit model) with the assumption of a normal distribution and the homoscedastic error term standardized as $\sigma = 1$. The logit models used for the two regressions in this study to measure the effect of demographic variables on the probability of being risk tolerant are as follows:

$$FRTS_i = \beta_0 + \beta_1 AG + \beta_2 GE + \beta_3 FE + \beta_4 LE + e_i \quad (6)$$

$$NFRTS_i = \beta_0 + \beta_1 AG + \beta_2 GE + \beta_3 FE + \beta_4 LE + e_i \quad (7)$$

where:

$FRTS_i$ = financial risk tolerance status,

$NFRTS_i$ = non-financial risk tolerance status,

AG = age of participant,

GE = gender of participant,

FE = field of education of the participant,

LE = level of education of the participant,

β_0 = the intercept,

β_1 to β_4 = the coefficients to be estimated and

e_i = the error term.

4 Empirical results

4.1 Distribution of risk tolerance

The distribution of the risk tolerance of the participants for both financial risk and non-financial risk is summarized in Table 2.

Table 2. Risk tolerance by demographic factors

Variables		Financial Risk Tolerant		Non-Financial Risk Tolerant	
		Count	% in variable	Count	% in variable
Gender	Male	183	79%	133	58%
	Female	39	16%	127	53%
Age	18 or younger	49	46%	0	0%
	19-21	65	49%	106	80%
	22-24	69	53%	87	66%
	25 or older	39	39%	67	67%
Academic year	First year	29	24%	57	48%
	Second year	22	29%	17	22%
	Third year	110	71%	91	58%
	Postgrad	61	52%	95	81%
Faculty	Commerce	172	87%	93	47%
	Engineering & IT	28	27%	57	55%
	Humanity	22	13%	110	65%

These results seems to support the domain school of thought, that people tend to exhibit different risk attitudes for each risk they encounter (Slovic, 1964; Corter and Chen, 2006). This can be observed in the different risk tolerance percentages for each of the demographic factors in question.

One can observe that as many as 79 percent of all male participants were tolerant of financial risk, while only 58 percent were tolerant of non-financial risk. Similarly, only 16 percent of female participants were tolerant of financial risk while as many as 53 percent were tolerant of non-financial risk. This trend is seen in relation to all the other demographic variables, including age, level of education, and field of education, as participants who showed higher tolerance for financial risk showed lower tolerance for non-financial risk, and vice versa.

With regards to age, respondents in the category of those aged 18 years old or younger showed relatively higher tolerance for financial risk (46%) than for non-financial risk (0%). By contrast, participants in the other age categories (19-21, 22-24 and 25 or older) showed higher tolerance for non-financial risk and lower tolerance for financial risk.

The level of education, in Table 2, showed a continuation of the established trend, with 24 percent of first year students being tolerant of financial risk and as many as 48 percent being tolerant of non-financial risk. Second year students, however, displayed more balanced tolerances for the two types of risk, with 29 percent of second year students being tolerant of financial risk and 22 percent being tolerant of non-financial risk. Third year students, on the other hand, showed a preference for financial risks, while postgraduates showed a preference for non-financial risks.

Field of study was another variable studied, with the three categories of commerce, engineering & IT and humanities. Of the 198 commerce participants, 178 (87%) were tolerant of financial risk, while only 93 (47%) of the same 198 participants were tolerant of non-financial risk. Higher percentages of participants in the engineering & IT and humanities categories (55% and 65%, respectively) tolerated non-financial risk, while smaller percentages (27% and 13%) tolerated financial risk.

Our results therefore show that the majority of participants tended to exhibit high tolerance for one risk type and low tolerance for the other risk type. This is in line with the domain dependent school of thought, according to which individuals' responses to risk change with the type of risk faced, and the level of risk tolerance varies across different risk domains (Corter and Chen, 2006).

4.2 Analysis of determinants of risk tolerance

Table 3 summarizes the logistic regression results for financial risk tolerance estimated from equation (6). Age was divided into two categories, namely, 1 for participants aged 25 and older, and 0 otherwise. Age has a negative coefficient, which is not statistically significant at the 5 percent level of significance. This indicates that the probability of being tolerant of financial risk does not change with age. The variable of field of study compared commerce to other fields of study (humanities and engineering & IT). This variable has a negative coefficient, significant at the 1 percent level of significance (p-value = 0.00), implying that the probability of being tolerant of financial risk was lower for humanities and engineering & IT students than for commerce students. Gender has a positive coefficient which is statistically significant at the 1 percent level of significance, indicating that being male increased the probability of being tolerant of financial risk.

Table 3. Financial risk tolerance regression results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0,64480	0,64854	-0,99423	0,32010
Age	-0,22887	0,13446	-1,70206	0,08870
Field of education	-1,53710	0,17589	-8,73909	0,00000*
Gender	1,91191	0,29361	6,51184	0,00000*
Level of education	0,42257	0,12914	3,27214	0,00110*
Note: *Significant at the 1% level of significance				

Level of education also has a positive coefficient, which is significant at the 1 percent level of significance. This indicates that postgraduate students were likely to tolerate more financial risks than undergraduate students in their first, second, and third years. In summary, the probability of being tolerant of financial risk is highly influenced by the participant's field of education, gender, and level of education.

Table 4 summarizes the logistic regression results for non-financial risk tolerance estimated from equation (7). Age has a positive coefficient, which is significant at the 1 percent level of significance, indicating that the probability of being tolerant of non-financial risk increases with age. Older individuals tended to have more tolerance of non-financial risks than younger individuals.

This means that participants aged 25 or older were likely to tolerate more non-financial risks than participants in lower age groups. Similarly, the field of education has a positive coefficient, which is statistically significant at the 1 percent level, implying that the probability of being tolerant of non-financial risk was less for commerce students than for humanities and engineering & IT participants.

Level of education has a statistically significant positive coefficient, indicating that postgraduate students were likely to tolerate more non-financial risks than undergraduate students. Gender has a non-statistically significant coefficient, implying that gender does not affect the likelihood of being tolerant of non-financial risk. This is different from the effect of gender on financial risk tolerance, which is statistically significant. Hence, gender has an influence on the tolerance of financial risk but has no effect on the tolerance of non-financial risk.

The effect of field of education on risk tolerance also changes with the type of risk: it has a negative effect on financial risk tolerance and a negative effect on non-financial risk tolerance. These findings suggest that the effect of demographic variables on risk tolerance attitudes varies across risk domains.

Table 4. Non-financial risk tolerance regression results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-5,01702	0,74993	-6,69000	0,00000*
Age	0,79042	0,10849	7,28577	0,00000*
Field of education	0,69761	0,16242	4,29498	0,00000*
Gender	0,41429	0,28834	1,43679	0,15080
Level of education	0,54486	0,10373	5,25291	0,00000*
Note: *Significant at the 1% level of significance				

5 Discussion and concluding remarks

The findings of this study support the domain dependent risk tolerance school of thought advocated by Slovic (1964) and Corter and Chen (2006). Our findings show that gender is a significant factor in financial risk tolerance, but not a key determinant of non-financial risk tolerance. Similarly, age influences the attitude towards non-financial risks but not the attitude to financial risks. Furthermore, studying in the field of commerce rather than other fields (humanities and engineering & IT) increased the likelihood of being tolerant of financial risk, while it decreased the likelihood of being tolerant of non-financial risk. Level of education is the only variable that showed a consistent effect on tolerance for the two types of risks. Specifically, both financial and non-financial risk tolerances increased as participants' level of education increased. This can be attributed to the fact that people with a high level of education become capable of assessing risks and benefits more carefully than those with a low level of education. There is evidence to suggest that a high level of education encourages people to take more risks, implying that a person who is more educated is more risk tolerant than a person with a lower level of education (Grable and Lytton, 1999; Christiansen et al., 2006; Al-Ajmi, 2008).

There is a variety of studies demonstrating a strong association between risk tolerance and demographic factors, and this paper builds upon the existing research by examining how age, gender, and education affect tolerance for both financial and non-financial risks. Our findings reveal that the effect of demographic factors on risk tolerance varies across risk domains. Consistent with past researchers such as Slovic (1964) and Corter and Chen (2006), we found that risk tolerance is domain dependent, such that individuals exhibit different opinions, attitudes, and tastes for each individual risk to which they are exposed. Age and education proved to be significant determinants of non-financial risk tolerance, while gender and education were significant determinants of financial risk tolerance. This research therefore confirms the idea that individuals tend to exhibit general risk tolerances across various risk domains, as advocated by Zuckerman and Kuhlman (2000), and hence that the level of risk tolerance cannot be generalized across different risk domains.

This study also emphasizes the importance of demographic factors when quantifying risk tolerance levels, whether that be for financial risk or non-financial risk. The implications of this study for financial companies is that the attitude to financial risks can be driven by other variables, such as those stated in this study, and that there is a possibility of a spillover effect of risk tolerances from one risk to another. Understanding risk tolerance behavior within the context of a developing country is vital for policy making and policy implementation in the development of financial markets. The measurement of risk tolerance contributes to financial development by addressing various issues such as portfolio optimization based on risk tolerance levels. Thus, relevant risk measurement tools are needed to capture the level of financial risk tolerance accurately.

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