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Demographic Factors Affecting Subjective Financial Risk Tolerance: South African Evidence

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**Demographic Factors Affecting Subjective Financial Risk Tolerance:
South African Evidence**

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Abstract

Central to identifying the appropriate portfolio for an individual is their individual financial risk tolerance. International evidence has shown that several demographic factors have a significant impact on an individual's financial risk tolerance. To date, however, very little research has been conducted on how demographic factors affect financial risk tolerance in a South African context. A Binary Logistic model was used to analyse the effect of the independent demographic variables on financial risk tolerance of a stratified random sample of 320 respondents surveyed in Pietermaritzburg, KwaZulu-Natal. It was found that age and gender were significantly related to risk tolerance, whilst there was mixed evidence as to the relationship between risk tolerance and race as well as income. These findings could be used by financial advisors to improve their understanding of their clients' subjective financial risk tolerance and provide better investment advice.

Keywords: financial risk tolerance, risk aversion, portfolio selection

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INTRODUCTION

An individual's optimal personal asset allocation is a product of two primary inputs, capital market returns and the individual's appetite for, or ability to tolerate, risk (Riley and Russon, 1995: 65). Financial risk tolerance is thus a key consideration when determining optimal portfolio allocations (Sung and Hanna, 1996: 11). Correctly identifying an individual's financial risk tolerance level is recognized as being an important part of providing appropriate financial advice, financial advisers in South Africa are expected to comply with the "know your client rule" (van Wyk, 2008: 18), but the ability to actually, and accurately, measure these levels is rare (Hanna and Lindaood, 2004: 29). In addition, Riley and Russon (1995: 68-69) have demonstrated that financial advisors' investment recommendations are influenced by their perceptions of risk tolerance which are related to individual's age, income, marital status, number of children and gender.

Lugovskyy and Grossman (2007: 2, 3) suggest that in many cases stereotypes have been used in assessing risk tolerance levels for individuals and that this can have potentially damaging effects. Subedar, McCrae and Gerace (2006: 2) highlight that as a result it is important that financial advisors collect reliable and relevant information from investors regarding their financial risk tolerance, rather than rely on heuristics, as there is a probability that financial advisors can misclassify investor's risk preferences, especially as individuals themselves are not always aware of their own tolerances.

Correctly measuring financial risk tolerance, and understanding the relationship between risk tolerance and demographic characteristics, is therefore an important issue for personal financial management but to date very little research in this area has been conducted in South Africa. This paper thus employs an internationally recognized instrument developed by Grable and Lytton (1999a) to investigate to what extent demographic factors influence an individual's willingness to take on financial risk in a South African context.

LITERATURE REVIEW

Hallahan, Faff and McKenzie (2004: 57) define personal financial tolerance as an indication of "...a person's attitude towards accepting risk...". Risk tolerance is generally accepted to be the inverse of the economist's concept of risk aversion (Faff, Mulino and Chai, 2008: 2; Hanna *et al*, 2001: 54). A distinction is made between objective and subjective financial risk tolerance related to the framework used to measure risk tolerance. The objective approach employs the Arrow-Pratt utility framework to derive a measure of risk aversion by determining the ratio of risky assets to wealth (Chaulk *et al*, 2003: 258 and Chang, DeVaney and Chiremba, 2004: 54). A subjective measure of risk tolerance, on the other hand, involves posing hypothetical questions to individuals requiring them to choose between risky alternatives.

International studies have employed both subjective and objective measures of risk tolerance to investigate the relationship between various demographic factors such as age, race, gender, marital status, religion and income/wealth that potentially affect an individual's desire or appetite for risk. The literature reviewed often shows conflicting results with some studies finding positive relationships between the level of risk tolerance and a variable, whilst others find a negative or no relationship for that specific variable.

We are only aware of two South African studies that have attempted to analyse the relationship between subjective financial risk tolerance and demographic factors. Strydom, Christison and Gokul (2009) employed a subjective risk tolerance measure, developed by Hanna and Lindamood (2004), for a sample of 84 third and fourth year Accounting and Finance students at the University of KwaZulu-Natal's Pietermaritzburg campus but their limited sample and methodological approach restricted their analysis. Gumede (2009) attempted to improve on the Strydom *et al.* (2009) study by employing a larger and more diverse sample of first year Economics students (also at the University of KwaZulu-Natal's Pietermaritzburg campus) , more variables and a more sophisticated form of statistical analysis, the ordered dependent variable method. Their findings are presented below together with the international evidence.

Age

Intuitively, one would expect financial risk tolerance to decrease as individuals get older as younger investors have more time to recover any financial losses and can replace leisure time with more work to compensate for any portfolio losses (Al-Ajmi, 2008: 15). The life-cycle hypothesis therefore theorises that risk tolerance decreases with age. Morin and Suarez (1983: 1210-1213); Schooley and Worden (1996: 92); Hallahan *et al.* (2004: 75) and Jiankopolos and Bernasek (2006: 999) all found evidence that risk tolerance decreased consistently with age.

In contrast Wang and Hanna (1997: 27) found that age was significantly related to investments in risky assets and therefore risk tolerance. Wang and Hanna (1997: 30) concluded that based on their results, risk tolerance increases with age and as a result the life-cycle hypothesis should be rejected. Grable and Lytton (1999b: 7) also found that older individuals exhibited higher levels of risk tolerance but also concluded that age accounts for a relatively small amount of the variation in financial risk tolerance levels.

Hanna *et al.* (2001: 56) and Anbar and Eker (2010: 505) found that there was no significant relationship between age and risk tolerance. Al-Ajmi (2008: 21) also concluded that there was no clear direction in terms of the affect age had on risk tolerance although he did find significant differences between age groups. Due to the nature of their samples in which there was little variation in the age of the respondents, Strydom *et al.* (2009) and Gumede (2009) did not investigate this variable.

Race

It is believed that an individual's race or ethnicity can potentially be a determinant in the amount of risk incurred (Yao, Gutter and Hanna, 2005: 58) however, the evidence as to which race group is the most risk tolerant is conflicting. Riley and Chow (1992: 36) comparing White, Black, Asian and Native American categories, found that levels of risk aversion were very similar across different race groups in the United States. In contrast, Bellante and Green (2004: 269) found evidence of greater risk tolerance for Whites relative to non-Whites in their sample. Similarly, Yao *et al.* (2005: 55) found that White investors were significantly more likely to take on some risk (59% of all White respondents) compared to Blacks (43%) who were significantly more likely to take on some risk than Hispanics (36%).

Interestingly, this was reversed when considering substantial risk as White respondents were least in favour of taking substantial risk (4%), followed by Blacks (5%) and finally, Hispanics (6%). Yao *et al.* (2005: 58) suggested that one possible reason for Blacks and Hispanics to favour the substantial risk category was due to their aspiration to reduce the gap in the standard of living or income inequality while the greater propensity for whites to have some risk could be explained by a low participation by Hispanics and Blacks in the financial markets.

Schooley and Worden (1996: 93) also found that Hispanics had the highest value of risky assets per dollar of wealth with Whites having the lowest and the other groups, Asian and American Indian, falling in between. Sahm (2007: 23, 39) found that there was a major difference between the risk tolerance levels of Blacks and Whites, whilst the difference between Hispanics and Whites was not very large. More specifically, Blacks were found to have a risk tolerance level that was 28 percent less than that of Whites while Hispanics were lower than Whites by only four percent.

Strydom *et al.* (2009: 17) suggested that Whites were significantly *less* risk tolerant than both Blacks and Indians in their study while Gumede's (2009: 24 and 34) results found that Whites were *more* risk tolerant than Blacks, Asians/Indians and Coloureds.

Income and Wealth

One would expect that as an investor's income and wealth increases they would be able to uphold a higher degree of financial risk (Cohn *et al.*, 1975: 610) but the converse to this may also be true. In the former case the perception may be that as an individual attains higher income his/her ability to tolerate losses is greater, whilst on the other hand an investor may become more prudent with higher income so as to avoid losing their hard-earned wealth (Hallahan *et al.*, 2004: 58). Morin and Suarez (1983: 1210) found that households in the upper wealth group showed a trend of decreasing relative risk aversion. Additionally, in their study wealth was found to be the most important variable in determining risk aversion levels. Similarly, Grable and Lytton (1999b: 6) found that a higher level of income was related to an above-average level of risk tolerance.

Hartog, Ferrer-i-Carbonell, and Jonker (2000: 9-19) employed three separate data sets in their study of risk tolerance. Using the Brabant Survey data of school children, they concluded that the relationship between income and risk aversion was negative, as well as the relationship between wealth and risk aversion. The survey of Dutch accountants, however, found no relationship between risk aversion and income. In the GPD Newspaper Survey it was found that risk aversion fell as income increased, providing further motivation that there was a positive relationship between financial risk tolerance and income and wealth. Schooley and Worden (1996: 96), also found that as a household's level of wealth increased so did their their holdings of risky assets, while Hallahan *et al.* (2004: 67) also provided evidence that wealth and risk tolerance exhibited a positive relationship.

Strydom *et al* (2009: 18) found that there was no significant relationship between income and risk tolerance but also identified that the low response rate to their income question made the reliability of their analysis questionable. Gumede (2009: 28-29 and 38), using a more sophisticated approach to measuring wealth, found that income had a positive effect on risk tolerance but the relationship was not statistically significant.

Gender

Previous research on the topic of gender and financial risk tolerance has been extensive and generally concluded that women are more risk averse than men and that men favoured more risky assets compared to women (Pålsson, 1996: 785, Hartog *et al*, 2000: 11, Hallahan *et al*, 2004: 67 and Al-Ajmi, 2008: 21-22). Powell and Ansic (1997: 622), using computer-based experiments concluded that females had a much higher risk aversion level than males, regardless of the degree of familiarity, frame or cost. Coleman (2003: 106, 109) found that women illustrated a higher level of risk aversion when compared to men but when comparing the ratio of risky assets to net worth for the same age categories, there was no significant difference in the ratios for men and women younger than 40 but women over the age of 40 had a lower ratio than men in the same age category. Hanna and Lindamood (2004: 34); Charness and Gneezy (2007: 13); Faff *et al.* (2008: 13-16) and Olivares *et al.* (2008: 10) also found that females were more risk averse than males.

Schubert *et al.* (1999: 384-385) found that there was not much difference between the financial risk tolerance of males and females under controlled (experimental) economic conditions and that risk tolerance in financial choices are dependent on the decision frame.

The authors further questioned the previous findings that males were more risk loving than females and concluded that the differing risk attitudes "...may be due to differences in male and female opportunity sets rather than stereotypic risk attitudes" (Schubert *et al.*, 1999: 385). Strydom *et al.* (2009: 15), using a sample where males and females had the same education, found some evidence that men preferred higher levels of financial risk but Gumede (2009: 22 and 33) found that there was no significant difference in financial risk tolerance between males and females.

Gender based differences may be attributed to the fact that financial advisors assume females are generally more risk averse and therefore, they are provided with conservative investment advice, a case of "statistical discrimination" (Bajtelsmit and Bernasek, 1996: 6). Chen and Volpe (2002: 290) suggest that gender differences in risk tolerance can also be affected by an individual's understanding of financial knowledge. Barber and Odean (2001: 261) believe that the reason for males being more risk loving than females is simply due to overconfidence where men are more confident than women when it comes to investing. Bernasek and Shwiff (2001: 345), however, argue that women have a greater chance of being exposed to poverty when they are older because, their lifetime earnings are generally lower and therefore, they are not able to accumulate as much savings or invest similar amounts. Added to this is the greater life-expectancy of women, implying that the little savings females have, in fact need to be spread out over a longer period.

Marital Status

Barber and Odean (2001: 285) found that single individuals held more volatile (i.e. risky) portfolios than those who were married. Hallahan *et al* (2004: 71) also concluded that single investors were less risk averse and thus, that marital status was a significant determinant in financial risk tolerance levels. Hawley and Fujii (1994: 202) found evidence that male heads of households and married men had very similar risk preferences, whilst single men preferred a higher level of financial risk. Similarly, comparing females, they found that married women were the most risk tolerant, followed by single women and then female heads of households. Yao *et al.* (2005: 56), reported that married females preferred lower levels of risk when compared to similar married men, whilst single males were more willing to take on high and substantial levels of risk compared to married males.

Hanna and Lindamood (2005: 8,9) and Gilliam *et al.* (2008: 7) also found that wives were less risk tolerant than husbands leading Hanna and Lindamood (2005: 10) to recommend that financial advisors need to assess the risk tolerance of both spouses when dealing with couples and suggested that when the levels differed it may be reasonable to use the average of the two scores. Gilliam *et al.* (2008: 7, 8), however, also found that wives who were university graduates had higher risk tolerance levels than their husbands but their husbands' mean risk tolerance score was lower than that of the husbands whose wives were not university graduates. Gilliam *et al.* (2008: 9) conclude that financial advisors should thus be wary of using demographic characteristics as a heuristic for determining individual risk tolerance levels. Due to nature of their samples, neither Strydom *et al.* (2009) or Gumede (2009) examined the marital status variable.

Education

Numerous studies have found that there is a positive relationship between the level of education obtained and risk tolerance. Riley and Chow (1992: 34); Schooley and Worden (1996: 92); Sung and Hanna (1996: 14); Donkers *et al.* (2001: 185); Grable and Joo (2004: 78); Bellante and Green (2004: 280); Chang *et al.* (2004: 62); and Kimball *et al.* (2007: 20) all concluded that education was positively related to financial risk tolerance. Bellante and Green (2004: 280) further found that differences in education levels accounted for larger variations in asset allocation than any other variable they examined. Chang *et al.* (2004: 62-64), in comparing subjective and objective risk tolerance, found that education was a significant predictor of subjective risk tolerance and that the ratio of risky assets to net worth was higher for respondents in the higher educational categories. As a result, Chang *et al.* (2004: 65) concluded that financial advisors should be cognisant of the educational backgrounds of their clients when giving advice due to the fact that clients with lower qualifications may need more information when making investment decisions.

Gumede (2009: 27) did not find a significant result in terms of education, whilst the Strydom *et al.* (2009) study did not investigate this relationship.

Religion

Relatively few studies have examined the effect of religion on financial risk tolerance. Barsky *et al.* (1997: 549) found that risk tolerance varies significantly according to religion

with Protestants being less risk tolerant than Catholics and Jews being the most risk tolerant. Halek and Eisenhauer (2001: 13, 14) however, found that an investor's religious belief had a minimal effect on their level of risk aversion with being Jewish the only variable that significantly impacted on risk aversion.

Strydom *et al* (2009: 18) found that Christians were the least risk tolerant compared to Muslims and Hindus, respectively, but cautioned against their results as they could not control for the effects of race in their study and acknowledged that there was an overlap between race and religion. Gumede (2009: 26) found that religion had no significant effect on subjective risk tolerance.

METHODOLOGY

Problem Statement and Research Objectives

It is evident from the preceding literature review that properly understanding an individual's financial risk tolerance is a critical part of achieving an optimal investment portfolio. In addition, there is extensive international evidence to show that financial risk tolerance is related to several demographic characteristics including gender, age, marital status, race, religion, education and wealth. For several of these variables, however, the empirical evidence is mixed and the precise nature of the relationship to financial risk tolerance is still subject to some debate. To date, very little effort has been made to investigate the relationship between demographic factors and subjective financial risk tolerance in the South African context. The purpose of this paper is therefore to investigate the extent to which demographic factors influence an individual's subjective financial risk tolerance. Particularly the study seeks to determine the relationship between risk tolerance and age, gender, education, marital status, race, income and religion.

Sample

Previous South African studies by Strydom *et al.* (2009) and Gumede (2009) used samples of university students which were relatively homogenous in terms of age, education and income. In order to achieve a larger and more diverse sample a shopping mall survey technique was employed. A shopping mall survey is more cost effective (Bush and Hair, 1986: 158; Hornik

and Ellis, 1988: 539) and has the advantage over telephonic interviews in that visual aids can be used (Sudman 1980: 423).

In order to try and ensure that the sample allowed for the various research questions to be examined a random stratified sampling techniques was employed to ensure that preselected subgroups of the population were represented (Hair *et al.*, 2008: 136). Following Sudman (1980: 430), gender and education were therefore used as the two control variables in specifying the relevant categories. A target of 30 male and female respondents in each education category was sought, according to the guideline provided by Leedy (1989: 158). Overall, 320 usable responses were collected in the survey process.

Survey Instrument

Grable and Lytton (1999a: 165) argue that while objective measures are commonly used, the deduction of a person's risk tolerance from their asset holdings could pose serious validity concerns as objective measures are based on the assumptions that investors behaved rationally and that an individual's asset allocation is a personal choice as opposed to being the product of advice from a financial advisor. They further argue that objective measures tend to be descriptive rather than predictive, do not account for the different dimensions of risk and generally cannot explain actual investor behaviour (Grable and Lytton, 1999a: 165).

Barsky, Juster, Kimball and Shapiro (1997: 538) provided further support for the survey technique because "...[t]he econometrician typically needs to posit a functional form. Instrumental variables are needed to control for potential endogeneity." Barsky *et al.* (1997: 538) stated that using surveys overcomes these issues as one can construct a survey instrument "...that is designed precisely to elicit the parameter of interest while asking the respondent to control for differences in economic circumstances that confound estimation." More simply put, it allows for a comparison to be made on fairer terms between all respondents regardless of differences in income, for example. The survey technique is not without its own weaknesses though, as Barsky *et al.* (1997: 538) acknowledged, particularly in that respondents may not be entirely accurate when answering questions. Subjective measures are however, not limited solely to the questionnaire technique. Hanna *et al.* (2001: 53) reported that there are a minimum of four methods of assessing risk tolerance which included "asking about investment choices, asking a combination of investment and subjective questions, assessing actual behaviour, and asking hypothetical questions with

carefully specified scenarios.” The use of questionnaires, however, is the primary subjective risk tolerance assessment method employed (Hallahan *et al.*, 2004: 59).

Strydom *et al.* (2009) and Gumede (2009) used a variant of the Hanna and Lindamood (2004) questionnaire. The Hanna and Lindamood (2004) questionnaire, however, has its limitations, in that a certain level of financial knowledge is needed to answer all the questions and it does not account for the different dimensions of financial risk tolerance. For this reason an alternative instrument developed by Grable and Lyton (1999a) which has been extensively tested and used in several international studies (see for example Grable and Lyton, 1999b; Yang 2004; Al-Ajmi, 2008; Anbar and Eker, 2010) was employed.

The Grable and Lyton instrument consists of 13 items measuring several components of financial risk tolerance extensively tested to measure its construct validity (Grable and Lyton, 1999a: 178). The criterion-related validity of the instrument was further tested with results showing moderate support for its concurrent validity (Grable and Lyton, 2003: 264). According to Pallant, 2007: 98 internal reliability can be tested using Cronbach’s Alpha with scores above 0.7 considered acceptable. Al-Ajmi (2008: 19) tested the instrument’s internal reliability and obtained a Cronbach’s alpha score of 0.742; Anbar and Eker (2010: 509) who also used the Grable and Lyton instrument obtained a score of 0.61).

Method Of Analysis

In a similar fashion to the studies by Sung and Hanna (1996), Hanna and Lindamood (2005) and Anbar and Eker (2010) this study employed a logit model in analysing the data. This model was preferred to other techniques (e.g. regression analysis and discriminant analysis) as it does not assume a linear relationship between the dependent and independent variables, nor does it require the assumptions that the variables are normally distributed and homoscedastic (Anbar and Eker, 2010: 511). The probit and logit models are very similar except that their assumptions around the error terms differ. A probit model assumes the errors follow the standard normal distribution while the logit model assumes they are logistically distributed (Kennedy, 2003: 260 and Koop, 2008: 279). It must be noted that a probit model was also estimated in order to determine whether there were any differences in the output produced. The results suggested that the models were very similar and it was found that the same explanatory variables were significant in both models.

FINDINGS AND ANALYSIS

Sample Descriptive Statistics

Table 1 shows the overall sample statistics in terms of how many observations were recorded for each of the explanatory variables.

Table 1: Sample Statistics

Variable	N	Total Observations
Age		319
Minimum	17	
Maximum	85	
Mean	41.03	
Gender		320
Male	172	
Female	148	
Race		320
Black	65	
Coloured	37	
Indian	81	
White	137	
Income		316
<R150 000	132	
R150 001<R235 000	84	
R235 001<R325 000	48	
R325 001<R455 000	25	
R455 001<R580 000	11	
>R580 001	16	
Education		320
Matric or less	121	
3 Year Undergraduate Degree/Diploma or less (but higher than Matric)	133	
Postgraduate Degree	66	
Marital Status		320
Single	135	
Married	164	
Divorced	21	
Religion		318
Christian	259	
Hindu	37	
Muslim	16	
Jewish	1	
Other	5	

A total of 320 usable responses were gathered from the survey, however, in some cases respondents did not complete all the demographic data required in the questionnaire. Therefore, the final model was estimated using the 313 valid responses.

In order to place individuals into a risk tolerance category, scores of one to four were assigned to each possible answer for each question, with the higher the score the more risky the choice selected and the individual scores totalled (Grable and Lytton, 1999a: 168-169; 175). Using the Grable and Lytton scores the highest possible score across the 13 items is 47 and the lowest 13. Table 2 below presents the summary data for the sample scores.

Table 2: Risk Tolerance Score Sample Statistics

N	Valid	320
	Missing	0
Mean		26.18
Std. Deviation		5.804
Range		31
Minimum		14
Maximum		45

The mean score for the sample was 26.18. Following Grable and Lytton (1999b: 4) and Anbar and Eker (2010: 508), respondents who scored below 26.18 were categorised as being below average risk tolerant and those that scored above 26.18 were categorised as being above average risk tolerant. In total there were 166 respondents who were below average risk tolerant (51.9% of the sample) and 154 who were above average risk tolerant (48.1%). The classification above average risk tolerant (coded 1) or below average risk tolerant (coded 0) was the used as the dependent variable in the Binary Logit model. The complete model estimated in this study is shown below:

$$RT_i = \alpha + \beta_1 Age_i + \beta_2 Gender_i + \beta_3 Education_i + \beta_4 MaritalStatus_i + \beta_5 Race_i + \beta_6 Income_i + \beta_7 Religion_i + \epsilon_i,$$

Table 3 presents the results from the Binary Logit model.

Table 3: Binary Logit Model Results

	Coefficient	Std. Error	z-Statistic	Prob.
C	0.637764	0.416610	1.530843	0.1258
AGE	-0.015243	0.007994	-1.906681	0.0566
GENDER	-0.436163	0.240213	-1.815729	0.0694
RACE	0.080982	0.107998	0.749851	0.4533
INCOME	0.250559	0.091721	2.731748	0.0063
EDUCATION	-0.038126	0.099234	-0.384207	0.7008
MARITAL_STATUS	-0.353277	0.216336	-1.633005	0.1025
RELIGION	-0.072591	0.132657	-0.547209	0.5842

Age and Risk Tolerance

The results show that age is statistically significant at the ten percent level and that the sign of the coefficient is negative. This finding is interesting as it suggests that there is a negative relationship between age and risk tolerance which indicates that older respondents are less risk tolerant than younger respondents in this survey. Accordingly, one can reject the null hypothesis that age has no effect on risk tolerance.

Gender and Risk Tolerance

The second hypothesis tested was whether there was any difference between the risk tolerance levels of males and females. The variable gender was found to be statistically significant at the ten percent level suggesting that gender does play a role in determining risk tolerance levels of respondents. The sign of the coefficient, being negative, suggested that females were less risk tolerant than males in the sample. Therefore, this result provides further support for the notion that females are less risk tolerant than males. It must be highlighted though that this is a general result for females and therefore, all females may not be below average risk tolerant.

Although, these results support the general perception that women have less appetite for risk compared to men it is still not safe to assume that this is the case for all females. Financial advisors are again cautioned against discriminating against females and assuming they are automatically less risk tolerant than their male counterparts because of their gender. Individual risk analysis should always be conducted in order to appropriately determine an

investor's risk appetite and therefore, match the required investment portfolio to the correct risk tolerance level. Based on this the null hypothesis that there is no difference in risk tolerance between males and females can be rejected.

Race and Risk Tolerance

The relationship between race and risk tolerance was investigated however, it was found that race was highly insignificant and therefore, had no effect on risk tolerance levels. The fact that the results suggest that there is no difference in risk tolerance across the race groups (Black, Coloured, Indian and White) is interesting as one would expect there to be based on the cultural diversity within South Africa. In contrast, the study by Strydom *et al* (2009: 17) suggested that Whites were significantly less risk tolerant than both Blacks and Indians in their study. It was thought that possibly income was capturing some of the effects for race in that there was a possibility that Whites had higher incomes than Indians and may therefore, be more risk tolerant. However, a comparison of the number of Indians versus Whites in the various income categories does not lend a great deal of support to this notion. Table 4 shows that a higher percentage of Indians (20.51%) actually fall into the top three income categories compared to Whites (16.18%). These findings suggest that further research into the relationship between race and risk tolerance is necessary.

Table 4: Income Levels for Whites and Indians

	Income						Total
	<R150 000	R150 001 <R235 000	R235 001 <R325 000	R325 001 <R455 000	R455 001 <R580 000	>R580 001	
Indian	33	16	13	8	4	4	78
White	52	38	24	12	3	7	136
Total	85	54	37	20	7	11	214

Household Income and Risk Tolerance

The results suggest that income has a highly significant effect on risk tolerance levels. The table shows a p value of 0.0063 and the positive coefficient infers that as an individual moves into a higher income bracket their risk tolerance increases. This relationship seems plausible as it shows that respondents who fall in the lower household income categories are less willing to risk their hard earned money possibly because they do not have as much disposable

income to spare. As a respondent's income increases there may be a greater capacity for them to take on higher levels of risk and therefore, their risk tolerance levels increase with their income levels.

Education and Risk Tolerance

The regression results shown in Table 3 indicate that education level had no significant effect on the level of risk tolerance of a respondent. The finding that there is no significant difference in risk tolerance across the education categories is surprising given the extensive international evidence that the two are positively related.

Marital Status and Risk Tolerance

The marital status variable was found to be borderline significant at the ten percent level with a p value equal to 0.1025. This result suggested that across the marital status categories of being single, married or divorced there was no difference in risk tolerance levels however, a larger sample may prove otherwise due to the fact that the p value was marginally greater than the required ten percent. Based on this one cannot reject the null hypothesis that marital status has no effect on risk tolerance. The negative sign on the coefficient, although not significant, suggests that divorcees are less risk tolerant than married respondents who in turn are less risk tolerant than those that were single.

Religion and Risk Tolerance

The results from the logit model suggested that religion had no significant effect on the risk tolerance levels of respondents in this study as the p value was found to be 0.5842 as shown in Table 3. From these results one cannot reject the null hypothesis that religion has no effect on risk tolerance. These results may have occurred due to the low numbers in some of the categories, for example there was only one Jewish respondent. Furthermore, a category such as Christian is an extremely broad one, considering the number of different denominations a respondent could belong to, and it may be more prudent to better define this variable and the categories in future research.

Limitations of the Study

It must be noted that this study was localized and that the sample was not necessarily representative of the broader South African. Caution should therefore be extended in attempting to generalize these results to the whole population. In particular it is worth observing that by design the sample was restricted to an urban population and that different results might be obtained if those living in rural areas were included. In addition certain sub-sections were under-represented which limited the statistical robustness of the analysis of marital status and religion. Nevertheless, important inferences can be made from the findings which have important implications for personal financial advisors.

CONCLUSION

Results from the various analyses conducted in this study provide further evidence that an individual's demographic characteristics play an important role in determining their risk tolerance levels. Age, gender and income, in particular, were found to have a major impact in determining an individual's subjective risk tolerance. Perhaps the most enlightening finding is that race and religion were not found to have a significant influence on subjective financial risk tolerance. A further surprising finding was that education did not affect financial risk tolerance which is in contrast to extensive international evidence that they are positively related. Further research could involve conducting similar studies in different geographic areas to determine how sensitive these results are to location, testing the relationship between financial risk tolerance and education more extensively and comparing subjective and objective risk measures for South Africans.

Individual risk tolerance is central to personal financial wealth management but is very poorly understood. This study provides valuable insight into how demographic factors affect an individual's subjective financial risk tolerance and as such contributes to a better understanding of how individuals in South Africa make financial decisions and to assisting financial advisors to provide financial advice that suits the individual needs of investors.

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