

A Study on Determinants of Financial Risk Tolerance

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Financial risk tolerance is one of the key elements for financial service providers and investors. It is essential for both to understand the risk level. Therefore understanding, assessing and measuring financial risk and factors that affect financial risk tolerance of investors have been interest of research. The purpose of this study is to investigate the relationship between age, annual income, education, occupation, gender, marital status and financial risk tolerance level. The multiple regressions used to predict the relationship between demographic factors and financial risk tolerance level. The study indicates positive relationship with annual income, education, occupation, and gender where as negative relationship with age and marital status. The financial risk tolerance increases with increase in annual income and education level while decreases with increase in age and get married.

Keywords: Demographic factors, Financial risk tolerance, Multiple regression

INTRODUCTION

Risk tolerance is an important concept for both financial service providers and investors. Earlier risk tolerance was used for construction of portfolio to decide the composition of various assets using risk return trade off (Droms, 1987). The financial risk tolerance level also measured using Markowitz portfolio optimization process (Schirripa and Trcotzky, 2000). When financial advisor is unable to determine risk tolerance effectively that leads to similar kind of investment funds among the investors (Jacobs and Levy, 1996). The investor considered their goals, time horizon, financial stability and risk tolerance capacity while taking any investment decisions (Garman and Forgue, 2003). Financial risk tolerance is a subjective and objective phenomenon (Chia-Chi Chang, Sharon A. DeVaney, & Sophia T. Chiremba, 2004). Financial risk tolerance is a subjective matter and genetic in nature (Hanna and Chen, 1997).

The financial risk also depends of personality and attitude toward the risk. Cordell (2001) argued that financial risk tolerance level, personality traits like emotions and attitude can change over a period of time by influencing external factors like life experiences and contact with friends and relatives. W.V.harlow, Keith C. Brown, (1990), has argued that risk tolerance measured with economic, Psychological and biological factors. Some may also focused that it is measured with the help of demographic and socioeconomic factors (Wallach and Kogan, 1961; MaInish, 1982; Morin and Suarez, 1983; Wang and Hanna, 1997; Grable and Joo, 1997; Grable and Lytton, 1998; John E. Grable & So-hyun Joo, 1999; Jasim Y. Al-Ajmi, 2008; Robert Fatt, Terrence Hallhan and Michael McKenzie, 2009; Hakan Ozerol, Selin Metin Camgoz, Dr. Mehmet Baha Karan, & Dr. Azize Ergeneli, 2011)

It is important for financial service advisor to precisely determine the determinants of financial risk tolerance. There are numbers of factors considered for determining risk tolerance level of investors like age, annual income, education, occupation, gender, marital status, etc. The impact of these factors is different at different investors. These factors will decide the investors risk tolerance capacity i.e. how much amount loss he or she can be borne. If the investor know the level of impact of these factors on their risk tolerance level then they may controlled or reduced by proper planning.

REVIEW OF LITERATURE

Presently investors are become too cautious in terms of risk. The perception & behaviour toward risk is different at different time period. Investors are also considered different parameters for deciding their own risk tolerance level. Hence some ideas taken from past literature that how investors perceived their risk tolerance level.

W.V.harlow, Keith C. Brown, 1990, “Understanding and Assessing Financial Risk Tolerance: A Biological Perspective”, studied that how economic, Psychological and biological factors affect on the financial risk tolerance. The result shows that the financial risk tolerance is significantly related to sensation-seeking and extroversion and Individuals who exhibit higher degree of various forms of sensation-seeking who less introverted are more willing to accept financial risk.

Neil F. Riley, Manuel G. Russon, 1995, “Individual Asset Allocation and Indicators of Perceived Client Risk Tolerance”, has analysed that how individual can perceive risk for asset allocation. They have considered to inputs for asset allocation, capital market return and client’s desire and ability to tolerate risk. They concluded that time horizon for a client is an essential element for proper asset allocation. The variable such as age, marital status, gender, and number of children are observable, time horizon which appears to have greatest explanatory power of risk tolerance.

John E. Grable, So-hyun Joo, 1999, “Factors Related to Risk Tolerance: A Further Examination”, studied on explain and predict financial risk tolerance. They used various demographic and socioeconomic factors to predict the financial risk tolerance. The result shows that education, financial knowledge, and income have positive and home ownership & number of dependents have negative relationship with person’s risk tolerance.

Govind hariharan, Kenneth S. Chapman, Dale L. Domian, 2000, “Risk Tolerance and asset allocation for investors nearing retirement”, have analysed the effect of risk tolerance on portfolio composition by using CAPM nearing retirement. The result shows that risk tolerant individuals invest lesser amounts in treasury bills. They also found that the division of individual portfolios between stocks and bonds was not systematically related to our measure of risk tolerance.

Sherman D. Hanna, Michael S. Gutter, Jessie X. Fan, 2001, “A measure of Risk Tolerance based on Economic Theory”, has measured risk tolerance based on economic theory and described the pattern of risk tolerance based on the measure. The result shows that there is a wide variation of risk tolerance in people, but no systematic patterns related to gender or age have been found.

Victor J Callan, Malcolm Johnson, 2002, “Some guidelines for Financial Planners in Measuring and Advising Clients about their Risk Tolerance”, has evaluated key issues to understand the risk tolerance of their clients for advisers and financial planners. They suggested that advisers and planners have to understand the psychology of each individual investor and the risk that they are willing to take. A well developed risk tolerance test and scientific measure helps in providing better advice and services.

Kenneth A. Froot, Paul G. J. O. O’Connell, 2003, “The Risk Tolerance of International Investors”, has measured investor’s confidence and risk tolerance. They tried to measure whether an observed price change is attributable to a shift in investor confidence or a change in fundamental value. The results shows that the risk tolerance component turns out to account for a substantial portion of variation in portfolio holdings and a smaller but meaningful amount of variation in equity returns.

Chia-Chi Chang, Sharon A. DeVaney, Sophia T. Chiremba, 2004, “Determinants of Subjective and Objective Risk Tolerance”, has measured the effect of factors on subjective and objective risk tolerance and whether subjective risk tolerance affects the objective risk tolerance. The result shows that education, race and employment were determinants of both subjective and objective risk tolerance and subjective risk tolerance positively influenced objective risk tolerance.

Robert W. Moreschi, 2005, “An Analysis of the ability of Individuals to predict their own Risk Tolerance”, has analyzed the capability of individuals to accurately estimate risk tolerance. Their finding was males make smaller forecast errors than females and more education leads smaller forecast errors and forecast errors appear to increase with age & income. They have concluded that the most significant factors are gender and forma education.

Michael J. Roszkowski, John Grable, 2005, “Estimating Risk Tolerance: The Degree of Accuracy and the Paramorphic Representations of the Estimate”, has determined that how

effective financial advisors and clients are at estimating risk tolerance and to see if one can represent the judgmental process through multiple regression models using items from a risk tolerance test and demographic characteristics. They have found that advisors' ability to predict actual risk tolerance is rather faulty, accounting for only about 17% of the variation in the clients' actual risk tolerance and the financial advisors are not particularly accurate when estimating their client's true level of risk tolerance, despite their training and experience. The conclusion was financial advisors in this study tended to be relatively worse at assessing even their own risk tolerance compared to their clients.

Coter J.E, & Chen Y. J, 2006, Do Investment Risk Tolerance Attitudes Predict Portfolio Risk?, found that the risk tolerance level was high for those investors whose has investment experience and higher risk portfolio than less experienced investors. The study has concluded that experience in the investment decided the risk tolerance level.

Jasim Y. Al-Ajmi, 2008, "Risk Tolerance of Individual Investors in an Emerging Market", for the purpose to understand the underlying factors that determines the investment decisions of individual investors in Bahrain. The Study has found that men are less risk aversion than women, less educated investors are less likely to take risk, the effect of age on risk tolerance is complex in contrast to reports in earlier studies, wealthy investors are more risk tolerate than the less wealthy investors.

Robert Fatt, Terrence Hallhan and Michael McKenzie, 2009, "Nonlinear linkages between financial risk tolerance and demographic characteristics", has studied the linkage between risk tolerance and demographical characteristics. The study found that age, no. of dependents and income exhibit basic quadratic association with financial risk tolerance.

John E. Gilliam, Swarn Chatterjee, Dandan Zhu, 2010, "Determinants of Risk Tolerance in the Baby Boomer Cohort", has examined whether the leading boomers differ significantly from the trailing boomers in their financial risk tolerance. The study shows that not only were the older leading boomers less risk tolerant than trailing boomers, age also associated with risk tolerance in the regression estimates of two sub-cohorts. The author has concluded that the lower income and less educated are more likely to underestimate their risk tolerance scores.

Hakan Ozerol, Selin Metin Camgoz, Dr. Mehmet Baha Karan, Dr. Azize Ergeneli, 2011, “Determining the Performance of Individual Investors: The Predictive roles of Demographic variables and Trading Strategies”, have measured effect of demographic variables and trading strategies on trading performance of individual investors. The findings suggest that investors, who have fewer amounts of portfolio value and turnover rates, have tendency to outperform the market. The Investor exhibiting superior performance is educated and relies on the recommendations of experts. There is a positive association between turnover and gender, indicating male investors have higher turnover rates.

OBJECTIVE AND SIGNIFICANCE

The purpose of this paper is to explore the relationship between selected demographic factors and financial risk tolerance level. The research question that this paper attempt to answer is whether the demographic factors of age, annual income, education, occupation, gender and marital status have any impact on the level of financial risk tolerance. This study is important for financial service provider and personal financial planner to understand the risk tolerance level their clients to offer better products which suit them as per their risk tolerance level.

DATA AND METHODOLOGY

The data were collected from the investors in Surat city using risk tolerance questionnaire. The samples of 210 investors chosen for the inclusion were randomly selected. Respondents were asked to complete thirteen self directed questions. Seven questions were used to measure each respondent’s risk tolerance while six questions were used to assess respondent demographic characteristics.

Dependent Variable: The risk tolerance level of each respondent’s used as a dependent variable measured by likert scale from highly lower risk taker to highly higher risk taker.

Independent Variable: The demographic factors like age, annual income, education, occupation, gender and marital status were used as independent variable measured on ratio and nominal scale. The data obtained on nominal scale were coded as dummy variable.

Statistical Analysis: Multiple Regressions was used to perform analysis of data. The data is coded as given in the table 1 below for regression analysis. The regression analysis is to find out

which demographic variables contribute to the prediction of risk tolerance and the extent of the contribution. Reliability test also measured to check the consistency of result.

Table: 1 Variable Coding for Regression Analysis

Age	Income	Education	Occupation	Gender	Marital Status
Respondent's actual age (24 to 61)	Respondent's actual income	Respondent's education (1 to 17)	Businessman = 1	1 = Male	1 = Married
			Professional = 2	0 = Female	0 = Unmarried
			Service = 3		
			Retired = 4		
			Other = 0		

HYPOTHESIS:

H0: There is no significant effect of demographic factors on financial risk tolerance level.

The following regression model used to measure the effect of demographic factors on financial risk tolerance level.

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + e$$

Where

Y = Relative changes in risk tolerance level

X1 = Age, X2 = Income, X3 = Education, X4 = Occupation, X5 = Gender, X6 = Marital status,

E = Error term

DATA ANALYSIS**REGRESSION ANALYSIS****Table 1 Model Summary^b**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.906 ^a	.821	.816	.476	1.961

a. Predictors: (Constant), Marital Status, Occupation, Education Qualification, Age of Respondents, Annual Income, Gender

b. Dependent Variable: Risk taking ability

Table 2 ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	211.580	6	35.263	155.553	.000 ^a
	Residual	46.020	203	.227		
	Total	257.600	209			

a. Predictors: (Constant), Marital Status, Occupation, Education Qualification, Age of Respondents, Annual Income, Gender

b. Dependent Variable: Risk taking ability

Table 3 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.386	.222		15.270	.000
	Age of Respondents	-.043	.003	-.476	-13.087	.000
	Annual Income	1.143E-6	.000	.226	5.806	.000
	Education Qualification	.097	.009	.353	10.909	.000
	Occupation	.114	.035	.111	3.234	.001
	Gender	.370	.090	.164	4.093	.000
	Marital Status	-1.126	.095	-.479	-11.810	.000

Reliability Test

Table 4

Cronbach's Alpha	N of Items
.756	9

The analysis of model summary in table 1 shows that change in financial risk tolerance is very well explained by the regression model as evident from adjusted R^2 value of 0.821. The model shows 82% of the variations in the risk tolerance level can be explained using six demographic variables.

The ANOVA table 2 shows validity for linear equation/model. The p-value is less than 0.05 which shows that the model is valid for using linear regression. The p-value is less than 0.05 which means that we fail to accept null hypothesis and there exist the relationship between these variables.

The regression coefficient table 3 shows whether demographical variable are having capacity to predict the risk tolerance and the extent of the contribution power. All the variable are statistically significant with p-value less than 0.05 which means that we fail to accept null hypothesis and there is a relationship between age, annual income, education, occupation, gender, marital status and financial risk tolerance level.

Financial risk tolerance level = 3.386 – 0.43 Age + 1.143 Annual Income + 0.97 Education + 0.114 Occupation + 0.370 Gender – 1.126 Marital status

The reliability test is used to measure the reliability of instrument used for risk tolerance measurement. The result shows in a table 4. The cronbach's Alpha value is 0.756 indicate the instrument is consistent and reliable.

CONCLUSION

The study indicate that there is a positive relationship between annual income, education level, occupation and gender with financial risk tolerance level where age and marital status have negative relationship with financial risk tolerance. Annual income has greater influence on

financial risk tolerance where education has lesser impact. The financial risk tolerance level increases with increase in annual income and education. Marital status has greater negative influence while age has lesser impact. The financial risk tolerance level decreases with increase age and person's get married. As age increase the people thought about retirement plan and do not want to lose money hence risk tolerance level decreases. When a person get married obviously the responsibility increases to fulfill all financial needs therefore they are not likely to take more risk.

IMPLICATIONS

The study used to financial advisor and personal financial planner for assessment of risk tolerance level of their clients. It is important for them to analyze demographic characteristic and offer them the product which are most suitable to them. The portfolio manager can construct appropriate portfolio for their clients by assessing investor's risk profile. Financial planner can serve the different needs of the investors according to their relative importance of various demographic characteristics.

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