

Financial Risk Tolerance: An Analysis of Investor's Cognitive, Decision-Making Styles and Cultural Effects

Shamila Nabi Khan

Business Administration, Lahore School of Economics, Lahore

Pakistan

nnks113@gmail.com

Abstract

This paper investigates financial risk tolerance (FRT) with multiple risk assessments: 13-item questionnaire (Grable and Lytton, 1999) and single item measurement (Survey of Consumer Finances, Kennickell, 2003). Demographics, opinions/attitudes, and investor's characteristics were used to explore the relationship with risk tolerance. Data was collected from two hundred and sixty-eight individuals who had invested previously and were currently employed. Results show that male, individuals with metric/ O level education, those expecting inheritance, transfer of assets or both, along with personality traits such as achievement, vigilance, emotions (positive and negative) in uncertain environment significantly effect financial risk tolerance. Culture dimensions such as femininity and uncertainty avoidance were also significant with risk tolerance while future outlook did not effect FRT. The results further indicate that multiple assessment of FRT is a better measure as it allows for in-depth analysis FRT sub-variables (investment risk, risk comfort and experience and speculative risk. Lastly, conclusion and discussion are presented.

Keywords—Investor's Attitudes, Investor's characteristics, Personality, Financial Risk Tolerance, developing country, Survey of Consumer Finances

1. Introduction

Financial risk tolerance has been defined by Grable (2000) as the amount of financial ambiguity an individual is presented with, when making decisions. It is the willingness to accept uncertainty when making financial decisions. Several techniques have been developed to measure financial risk tolerance. These techniques are by observing risk behaviors and those using surveys

to gauge investor's behaviors (Hanna, Gutter, & Fan, 2001; Hanna & Lindamood, 2004). Grable (2000) suggested a combination of investment and speculative choices along with comfort with risk and experience to measure financial risk tolerance.

Financial risk tolerance has been studied in regards to demographics by several authors (Yao & Hanna, 2005; Grable, 2000; Sung & Hanna, 1996). Grable and Joo (1997) and Carducci and Wong (1998) suggested several attitudinal factors that could influence individual's willingness to take financial risk regarding money matters. Hence it was proposed that personality factors, cognitive style, decision making style and characteristics, risk taking all play significant role in identifying the financial risk tolerance of an individual.

The purpose of this research is to examine the relationship between the demographics (gender, age, education, ethnicity, marital status, income bracket and employment status), opinion/attitudes (health condition, inheritance expectation, economic outlook, and homeowner) and investor's characteristics (decision making styles, emotions (regarding past investment), risk taking now and in past, cognitive style index, big five personality model, decision making characteristics, culture, and future investment outlook) in the developing country.

This research contributes to the existing literature by exploring financial risk tolerance with decision-making variables that are significant to understand the investor's risk tolerance. Further on, relationship between big five-personality model, cognitive style index, risk taking, emotions and decision-making characteristics were explored with FRT and SCF.

2. Literature Review

Risk tolerance has been defined as a person's attitude towards taking risk (Hallahan et al., 2004). Risk tolerance has been identified as having four dimensions: financial, physical and social as analyzed by Jackson, Hourany, and Vidmar (1972). Demographics have been identified as a major determinant to risk tolerance along with personality.

Several studies on financial risk tolerance have investigated demographics to play a major role in identifying the financial risk tolerance of the individual (Kannadhassan, 2015). Bertaut and Starr-McCluer (2000) investigated the ownership of risky assets within white and non-whites. Coleman (2003) examined the stock holdings with the effects of race. Grable and Joo (1999) explored the effect of white-collar employees to be willing to take risk in comparison to white and non-whites. Previous studies indicated that males are more risk tolerant compared to females

(Hariharan, Chapman & Domian, 2000; Hartog, Ferrer-I-Carbonell & Jonker, 2002). Research on married couples to be risk tolerant was not consistent. Hartog et al. (2002) found the married couples to be less risk tolerant than singles. Several authors have suggested that education and income also play an important role in regards to risk tolerance (Baker & Haslem, 1974; Shaw, 1996).

Jianakoplos and Bernasek (1998) explored the effects of gender on risk tolerance and found significant relationship. Grable (2000) showed that males have lower risk tolerance than females. Baker & Haslem (1974) researched the relationship of education with income and found that as education increased risk tolerance also increased. The relationship of risk tolerance and income and wealth was also significant.

Ogden et al. (2004) suggested that subculture which included race and ethnicity along with group/culture values that develop over time significantly impact financial risk tolerance. Further, Dilworth-Anderson, Burton and Johnson (1993) suggested that difference in culture and ways of socialization, among different groups racial and ethnic can influence individual's willingness to take financial risk.

Economic expectations play a significant role in identifying the risk tolerance of an individual (Grable & Lytton, 1997). A difference in judgment of a situation such as risky investment or knowledge of risk affects a person's ability to react differently towards risk (Sung & Hanna, 1996; Grable & Joo, 1997).

Carducci and Wong (1998) has identified personality factors such as type A personality to accept more risk tolerant than those with Type B personality. Grable (2000) also confirmed that personality type A were more willing to accept risk than personality type B. Expectations, attitudes, decision making, emotions and risk taking have been suggested to affect risk tolerance by Carducci and Wong (1998). Zuckerman (1990) related sensation seeking and risk taking and found significant relationship. Several authors have studied personality factors with willingness to take risk. Personality was investigated by Mahmood (2015) with FR. The research findings showed that personality has some impact on investor's risk tolerance that further effect investment decisions.

3. Empirical Methodology

Data

The data collection method used for this study was self- administered questionnaires. The sample size for this study was three hundred respondents. Individuals who had previously invested and were employed were specifically selected for this study. The data was collected from Lahore, Pakistan in May-July of 2013. Out of 300 hundred questionnaires only two hundred and sixty eight questionnaires were found completed. Hence the final observations were two hundred and sixty eight. Table 1 shows the breakup of investment motives, types, financial planning with age and income bracket of the respondents.

TABLE 1: INVESTMENT NEEDS AND DEMOGRAPHICS

	Frequency	Percent
I plan ahead (financially) for		
A few days	40	14.9
A few months	72	26.9
A year	92	34.3
A few years	47	17.5
Several years	17	6.4
Total	268	100.0
For what events/occasions would you invest/save		
Wedding	98	36.6
Household objects (Car, House, lifestyle)	89	33.2
Education	34	12.7
Other	47	17.5
Total	268	100.0
I Invest in...		
Life Insurance	42	15.7
Saving Account	69	25.7
Money Market Funds	40	14.9
Bonds	39	14.6
Stocks	21	7.8
Real Estate	25	9.3
Options/Futures	11	4.1
Gold/Silver	8	3.0
Commodities	1	.4
Committee	12	4.5
Total	268	100.0

Income Bracket		
20,000 to 40,000	40	14.9
41,000 to 60,000	30	11.2
61,000 to 80,000	56	20.9
81,000 to 100,000	46	17.2
100,001 and above	94	35.1
Total	266	99.3
Respondent's age		
24-30	93	34.7
30-39	83	31.0
40-59	82	30.6
60 and above	9	3.4
Total	267	99.6

Measures

Dependent variables. The dependent variables were selected from financial risk tolerance experimental scale developed by Grable and Lytton (1999). Grable and Lytton (1999) empirically define risk tolerance as having three sub variables: investment risk, risk comfort and experience and speculative risk. Apart from using the questionnaire developed by Grable and Lytton (1999) financial risk tolerance used by Surveys of Consumer Finances (SCF) was also analysed. This item has three choices: above average risk, average risk and no risk (Kennickell, 2003).

Independent variables. The independent variables used in this study can be divided into three categories: demographics, opinion/attitudes and investor's characteristics. Demographic variables included: gender, age, education, ethnicity, marital status, and income bracket and employment status. Opinions/attitudes variables included health condition, inheritance expectation, economic outlook, and homeowner were also included.

Investor's characteristics variables included measured by decision-making styles by 41 items, emotions (regarding past investment) were represented by 6 items and risk taking now and in past were measured by 7 items. Cognitive style index (analytical versus intuitive) were measured by 38 items and big five personality model (extraversion versus introversion, agreeableness versus

hostility, conscientiousness versus lack of conscientiousness, emotional stability versus neuroticism, and openness to experience versus closeness to experience) by 41 items. Decision-making characteristics (vigilance, hyper vigilance, buck-passing and procrastination) were measured by 8 items, culture (power distance, uncertainty avoidance, masculinity and collectivism) by 7 items and future investment outlook was measured by 6 items represented the expected investors outlook on investment.

Statistical Methods

In this study, two types of regressions were used. For the risk tolerance, investment risk, risk comfort and experience, and speculative risk OLS regression was used. All independent variables were regressed on four dependent variables cumulatively. For the single item measurement of risk tolerance, the categories were converted into dummy variables and regressed used logit regression. Above average risk and average risk were examined with no risk. Several independent variables such as gender, education, income, age, ethnicity and marital status were converted into dummy variables along with dependent variable were converted into above average risk and average risk versus no risk.

4. Results

OLS Results

Risk tolerance. Risk tolerance was significant with individuals who had metric/ O levels education (see Table 2). Autonomy was found to be significant to risk tolerance indicating that individuals who preferred autonomy to structure were more tolerant to risk as opposed to those who preferred structure. Unconscientious individuals were more risk tolerant as opposed to conscientious individuals. Individuals who were risk tolerant showed negative relation to hyper vigilance and procrastination indicating that procrastination and hyper vigilance was not a characteristic of risk tolerant individuals.

Investment risk. Males were highly significant with investment risk as opposed to females. Individuals, who were expecting inheritance, transfer of assets or both were positively related to investment risk. Investment risk was found to be significant with closeness to experience indicating that individuals who were not open to experience found investment risk to be safe.

Risk comfort and experience. Comfort with risk was associated with investor's who had metric/ O levels education. If the perceived health of the individual was fair comfort with risk was high. Individuals who owned home were more comfortable with risk and were willing to experience risk. Achievement was found to be significantly related to risk comfort. Individuals who preferred autonomy were highly related with risk comfort. People who had low consciousness were significant to comfort with risk. Vigilance was positive related but hyper vigilance was negatively significant to comfort with risk. Uncertainty avoidance was negatively related to risk comfort also.

Speculative risk. Separated individuals were found to be negatively significant to speculative risk compared to married individuals. Further non-Punjabis were negatively significant to speculative risk when compared to Punjabis indicating that investors with Punjabi ethnicity were related to speculative risk. Within the income bracket, investors with income of Rs. 20,000- Rs. 40,000 were found to be negatively significant with speculative risk when compared to investors with income Rs. 41,000- Rs. 60,000.

Within the variables selected for study for investor's characteristics, individuals who are spontaneous as apposed to deliberation decision-making styles were found to be significant. Individuals who were willing to take less risk in the past were significantly related to speculative risk. While risk taking now was also found to be positively significant to speculative risk indicating the individuals who are willing to take risk now were significant to speculative risk. Hyper vigilant individuals were less involved in speculative risk while buck-passing was positively significant with speculative risk. Lastly, feminine culture was significant with speculative risk.

TABLE 2: OLS REGRESSION

	Risk Tolerance	Investment Risk	Risk Comfort & Experience	Speculative Risk
R²	0.346	0.276	0.375	0.318
Adjusted R	0.198	0.113	0.234	0.165
F-value	2.349***	1.697***	2.665***	2.073***
Intercept	2.559***	2.481***	2.706***	2.706***
<i>Demographic Characteristics</i>				
Gender: reference category = female				
Male	0.090	0.203**	0.126	-0.159
Age: reference category = 30 to 39				
24-30	0.014	-0.007	-0.045	0.148
40-59	-0.011	-0.003	-0.032	0.012
60 and above	0.092	-0.095	0.153	0.304
Marital status: reference category: married				
Single	0.104	0.129	0.091	0.085
Separated	-0.198	0.063	-0.133	-0.739*
Divorced	0.307	0.318	0.211	0.451
Widowed	0.047	0.128	0.347	-0.587
Education: reference category = some college education but no degree				
Less than metric/O levels/High school	-0.021	-0.026	0.082	-0.185
Metric/ O levels/High school	0.301**	0.369	0.403**	0.019
Bachelor's degree	0.031	0.224	-0.139	-0.006
Master's degree	0.131	0.278	-0.034	0.161
Higher than Master's degree	0.118	0.289	-0.063	0.133
Ethnicity: reference category = Punjabi				
Non- Punjabi	-0.019	0.018	0.046	-0.186*

Income bracket: reference category = Rs. 41,000- Rs. 60,000

Rs. 20,000- Rs. 40,000	-0.125	0.003	-0.142	-0.312**
Rs. 61,000- Rs. 80,000	-0.035	-0.094	-0.027	0.049
Rs. 80,000- Rs. 100,000	-0.45	-0.544	-0.054	0.012
Rs. 100,001 and above	-0.088	-0.010	-0.031	-0.149

*Opinion/Attitudes***Health condition: reference category = good health**

Excellent health	-0.027	-0.095	-0.062	0.143
Fair health	-0.121	0.099	0.199**	-0.028
Poor health	0.007	0.245	.038	-0.442

Expect to receive inheritance/transfer of assets: reference category = none

Inheritance	0.099	0.035*	-0.034	0.154
Transfer of assets	-0.013	0.112*	-0.021	0.165
Both	0.029	0.144*	-0.049	-0.031

Homeowner: reference category = no

Yes	-0.085	-0.079	0.149**	0.012
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Future economic outlook: reference category = negative

Positive	0.005	0.124	-0.024	-0.148
Stable	-0.57	-0.013	-0.033	-0.172

*Investor's characteristics***Decision making style (DMSQ)**

Achievement	0.048	-0.036	0.144**	0.029
Emotional involvement	-0.069	-0.076	-0.054	-0.083
Risk Preference	-0.018	-0.002	-0.025	-0.033
Structure (versus autonomy)	-0.096*	-0.084	-0.139**	-0.044
Spontaneity (versus deliberation)	0.073	-0.082	0.082	0.318***

Emotions (past financial decisions)

Positive Emotions	0.060	0.047	0.039	0.117*
Negative Emotions	0.052	-0.009	0.053	0.154**

Everyday risk-taking

Risk taking now	0.096*	0.046	0.092	0.183**
Risk taking past	-0.032	-0.017	0.037	-0.173**

Cognitive style index

Analytical (versus intuitive)	0.072	0.082	0.104	-0.001
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Big Five Personality

Extraversion	0.027	0.069	0.023	-0.036
Agreeableness	-0.013	0.004	-0.001	-0.059
Conscientiousness	-0.161***	-0.130	-0.189**	-0.165
Neuroticism	-0.012	-0.023	0.029	-0.062
Openness to Experience	0.057	.0162**	-0.013	-0.023

Decision making characteristics

Vigilance	0.066	-0.017	0.137**	0.088
Hyper vigilance	-0.193***	0.025	-0.393***	-0.221*
Buck-passing	0.092	0.069	0.060	0.194**
Procrastination	-0.127**	-0.271***	0.041	-0.166

Working Culture

Power Distance	0.030	0.066	-0.030	0.071
Uncertainty Avoidance	0.040	-0.053	-0.102**	0.089
Masculinity (versus femininity)	-0.048	0.006	-0.036	-0.159**
Collectivism (versus individualism)	-0.037	-0.016	-0.092	0.019
Future investment outlook	0.022	-0.002	0.044	0.023

Logit regression Results

Above average risk versus no risk: Separated individuals were more willing to take above average risk (see Table 3). Individuals, who were expecting inheritance, transfer of assets or both showed lower level of willingness to take above average risk as opposed to no risk. Individuals who expected future economic outlook to be positive and stable were more willing to take above average risk as opposed to no risk. Achievement oriented individuals were positively related to above average risk. Further, intuitive cognitive style of an individual was a trait of individuals

willing to take above average risk. Intuitive cognitive style was found to be positively related to above average risk. Agreeable, emotional stability and uncertainty acceptance was positively related to individuals willing to take above average risk.

Average risk versus no risk: Average risk was found to be positively associated with extroversion personality. Risk preference was positively related to individuals willing to take average risk. Investors who expected future economic outlook to be stable were willing to take average risk while investors expecting inheritance, transfer of assets or both were all positive significant with average risk as opposed to no risk meaning that respondents who expected inheritance, transfer of assets or both were willing to take average risk.

TABLE 3: LOGIT REGRESSION

	Above Average Risk	Average Risk
R²	0.541	0.415
Intercept	1.845	-6.790
<i>Demographic Characteristics</i>		
Gender: reference category = female		
Male	-1.477**	1.291***
Age: reference category = 30 to 39		
24-30	-0.568	0.151
40-59	-0.471	-0.007
60 and above	0.911	0.781
Marital status: reference category: married		
Single	0.948	-0.373
Separated	2.670*	0.519
Divorced	-14.238	17.951
Widowed	-23.059	-21.720
Education: reference category = some college education but no degree		
Less than metric/O levels/High school	2.632	-2.398
Metric/ O levels/High school	-1.304	0.137
Bachelor's degree	-1.304	0.980
Master's degree	-1.058	0.755
Higher than Master's degree	0.376	-0.250
Ethnicity: reference category = Punjabi		
Non- Punjabi	0.259	0.455
Income bracket: reference category = Rs. 41,000- Rs. 60,000		
Rs. 20,000- Rs. 40,000	-0.125	-0.606
Rs. 61,000- Rs. 80,000	-0.035	-0.308
Rs. 80,000- Rs. 100,000	-0.45	-0.544
Rs. 100,001 and above	-0.088	-0.482

*Opinion/Attitudes***Health condition: reference category = good health**

Excellent health	0.201	-0.208
Fair health	-0.381	-0.439
Poor health	-22.786	21.711

Expect to receive inheritance/transfer of assets: reference category = none

Inheritance	-1.342**	0.865*
Transfer of assets	-1.265**	0.842*
Both	-1.660**	0.891*

Homeowner: reference category = no

Yes	-0.324	0.379
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Future economic outlook: reference category = negative

Positive	2.145***	-0.525
Stable	1.523**	1.014**

*Investor's characteristics***Decision making style (DMSQ)**

Achievement	1.600***	-0.469
Emotional involvement	0.252	-0.835
Risk Preference	-0.731	1.188***
Structure (versus autonomy)	-0.008	0.137
Spontaneity (versus deliberation)	0.890	0.039

Emotions (past financial decisions)

Positive Emotions	0.674	-0.137
Negative Emotions	0.352	-0.144

Everyday risk-taking

Risk taking now	0.657	0.274
Risk taking past	0.123	-0.449

Cognitive style index

Analytical (versus intuitive)	-1.668**	0.446
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Big Five Personality		
Extraversion	-0.323	1.444***
Agreeableness	1.205*	-0.721
Conscientiousness	-0.554	0.413
Neuroticism	-1.477*	0.778
Openness to Experience	-1.096	-0.153
Decision making characteristics		
Vigilance	0.421	0.350
Hyper vigilance	-0.049	-0.476
Buck-passing	-0.056	-0.427
Procrastination	-0.725	0.670
Working Culture		
Power Distance	-0.400	0.197
Uncertainty Avoidance	-1.357***	0.693
Masculinity (versus femininity)	-0.373	0.168
Collectivism (versus individualism)	0.058	-0.315
Future investment outlook	0.680	-0.501*

5. Discussion

Risk tolerance impacts demographics, this research suggested that males are higher risk tolerance and are willing to take risk as opposed to females. However, Yao and Hanna (2005) suggest that based on the economic analysis females should be more risk tolerant. Further on it was found that education to play significant role. Individuals with metric/ O level education were high on financial risk tolerance as opposed to individuals with Bachelor's education.

This research linked expectation to receive inheritance, transfer of assets or both to play a significant play in identifying risk tolerance of an individual. Inheritance, transfer of assets and/or both were significant to investment risk, above average risk and average risk. This needs to be investigated more deeply as expectation to receive assets and inheritance makes the investor comfortable and more willing to take risk. Unconscientious and vigilant investors were related to

risk tolerance. An investor who is willing to take risk was found to be more vigilant and was considered unconscientious.

These results show help financial planners to educate the clients about the appropriate level of financial risk they can take. Attitudinal characteristics as well as personality factors can help the financial planners to decision the action these investors will or will be willing to take.

Conclusion

The study investigated financial risk tolerance two ways: firstly, by employing the questionnaire developed by Grable and Lytton (1999) and secondly SCF single item risk tolerance question developed by Kennickell (2003). The independent variables were demographics, opinions/attitudes along with investor's characteristics. OLS regression and logistic regression was used to test for each of the financial risk tolerance questionnaires.

In investigating the characteristics of risk tolerant individuals, several demographics, opinions/attitudes and investor's characteristics were found to be significant. For risk tolerance, males showed more risk tolerance than females, individuals with metric/ O level education were high with risk tolerance, and hyper vigilance was negatively related to risk tolerance. Investment risk was found to be significant to males, inheritance, transfer of assets or both, and openness to experience and negatively related to procrastination. Risk comfort was related to individuals with metric/ O levels, fair health, homeowner, achievement, autonomy, conscientiousness, vigilance, hyper vigilance and uncertainty avoidance. Speculative risk was significant to individuals with income Rs. 20,000- Rs. 40,000, spontaneity, negative emotions, risk taking now and past, hyper vigilance, buck-passing and femininity culture.

For the logit regression, above average risk was significant with males, inheritance, transfer of assets or both, positive and stable economic outlook, achievement, intuitive cognitive style, and femininity culture. Average risk was significant with males, inheritance, transfer of assets, or both, risk preference, extraversion and future investment outlook.

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