Risk Tolerance Profile of Business Students in Pakistan

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Abstract
The study on the relationship between demographic variables and risk tolerance among business graduates in Pakistan. The correlation and regression analysis on a sample of 382 business students exhibit the following results. Empirical result of the correlation matrix are showing a positive significant correlation between risk tolerance gender, annual savings, age, experience and annual income and location except occupation which shows significant but negative correlation. Regression analysis depicts significant relationship between Risk tolerance Gender, Savings and Location shown by the t-values 2.037, 2.886, 58 and p –values .042, 0.004, and 0.000 respectively. However an insignificance relationship was found between Risk Tolerance Age, Education, Experience, Income and Occupation exhibited by their t-values -1.290, .638, -.035, -1.886, all less than 2 and p-values above 0.05 respectively.

Keywords: *Investment Preferences, Risk Tolerance and Demographics*

1. Introduction

The paper is focusing on risk tolerance as it was considered as a criterion variable in the study of Hallahan, Faff, and McKenzie (2004), Grable (2000) and Grable, Lytton, and O'Neill (2004)as opposed to the study of (Brennan & Kraus, 1976; Gron & Winton, 2001; Walls & Dyer, 1996)Baker and Haslem (1974) counted portfolio diversification as risk tolerance dependent. Similarly Beebower, Brinson, and Hood (1986) revealed that more than ninety percent of the variations in portfolio return are determined by risk tolerance. According to (Grable *et al*., 2004; Grable,2000; Hallahan *et al*., 2004)risk tolerance is defined as the maximum potential of an investor to absorb and face variability in investment return while making a financial decision. Where as in the words of (Grable, 2000; Joo & Grable, 2004) risk tolerance is defined as the capability to cope with shock arises from the volatility and inconsistency in returns that investors were readily opting while making an investment decision. The study is needed as it was an extension of Grable (1997)work as it was suggested to replicate the study while taking only demographic factors that is taking qualification, gender, profession or employment status and income as classification factors. The study of Lovric, Kaymak, and Spronk

(2008)and (Graham, Stendardi Jr, Myers, & Graham, 2002)had also considered age, income and gender are the most influencing factors of investment. According to the study of Joo and Grable (2004), Laroche, Bergeron, and Barbaro-Forleo (2001) and Pålsson (1996)social and demographic factors could not be excluded from the study of investment .Their studies highlighted factors like age, gender, income level, and education as matter of concerned for studies on investment.

Several studies have shown a negative nonlinear association of age and risk tolerance. Riley Jr and Chow (1992) explored the relationship of risk aversion and investment choices at different ages among of U.S. households. Looking into U.S. financial diary panel data,McInish, Ramaswami, and Srivastava (1993)find out the relationship between asset acquisition and age and concluded an in insignificant relationship between age and acquiring risky assets concluding that younger investors to be more risk tolerant than older investors. In contrast there are studies exhibiting an opposing stance of no relationship between age investor preferences given by risk tolerance(Gollier, 2002; Grable & Lytton, 1999; Grable, 2000; Hanna, Gutter, & Fan, 2001; Hariharan, Chapman, & Domian, 2000; Wang & Hanna, 1997).While considering gender as one of the independent demographic factor in this study. There are a number of studies about the relationship between risk tolerance and gender of the investors. The studies of (Bajtelsmit, Bernasek, & Jianakoplos, 1999;Grable, 2000; Powell & Ansic, 1997) concluded men to be more risk tolerant on the basis of gender.

Hanna, Gutter, and Fan (1998) and Grable and Joo (2000) consider gender differences of no significance in predicting risk tolerance.Yao, Gutter, and Hanna (2005)conducted an experimental study concluded that keeping economic conditions constant females are not subjects to less risky financial decisions than males.Hanna *et al*. (1998) and Grable and Joo (2000) study is elaborating gender differences to be in significant with respect to risk tolerance.Hallahan *et al.* (2004)studied the risk averse trends among women as opposed to the risk taking aptitude among men. Furthermore some studies are predicting about less risk taking aptitude among wealthy individual as contrast to less wealthy given by the work of(Hinz, McCarthy, & Turner, 1997).The study is carrying income with respect to investor preferences. The findings of the different studies exhibited a positive relationship between income and risk tolerance(Cohn, Lewellen, Lease, & Schlarbaum, 1975; Grable & Lytton, 1999; Riley Jr & Chow, 1992).The study of Baker and Haslem (1974),Sung and Hanna (1996b) also consider that education enhances a person ability to better prioritize their investment on the basis of risk. It also exhibits a positive correlation among investment preferences and education.

2 Research Methodology

This section is composed of theoretical frame work, research design, Sampling procedure and conceptual back ground and theoretical framework analysis and conclusion.

2.1 Research Design

Descriptive and correlational looking for the relationship between demographic factors and risk tolerance in Pakistan while adopting a model given byLeimberg, Satinsky, LeClair, and Doyle (1993).

2.2 Data Collection

The data was collected from major cities of Pakistan from 1stJanuary, 2016 to 30thApril, 2016 while adopting convenient sampling method 500 questionnaires were distributed

out of which 400 were collected in which 382 were correctly posted and the rest inappropriately filled were discarded.

2.3 Conceptual Background and Theoretical Framework

The study had derived it conceptual layout and theoretical frame work from the financial management model developed by (Leimberg et al., 1993) considering demographic composed of financial well-being, income, expenditure and risk tolerance. Whereas Grable (1997) also encourages the research in the area to work on the demographics aspect as well. In short after thoroughly envisioning the background literature it is finally deemed appropriate to proceed with model depicted below.

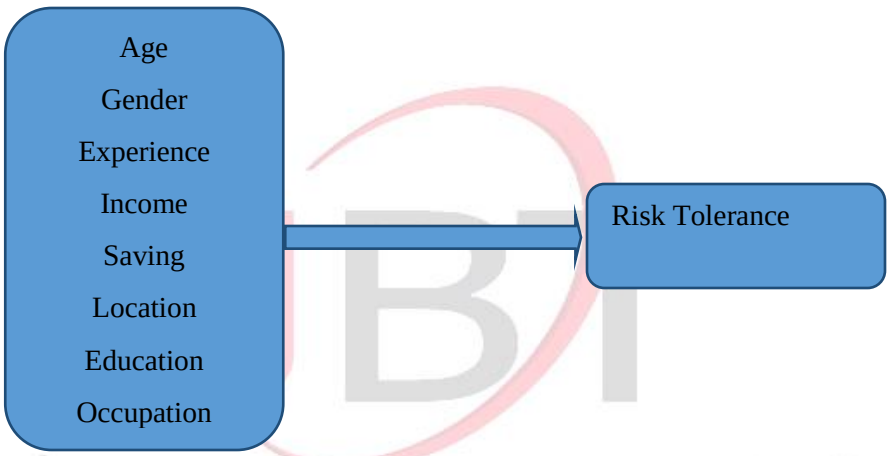

Figure 1: Theoretical Framework
(Adopted from Financial Management Model,(Leimberg et al., 1993))

3. Analysis

Regression and correlation were statistical techniques were used to analyze the data. Mcneil, Newman, and Fraas (2011)regarded multiple linear regression in order to test association between categorical variables, between categorical and continuous variables, or between continuous variables.

$$RT = \beta 1\mathrm{Gen}_{D0} + \beta 2\mathrm{Gen}_{D1} + \beta 3\,\mathrm{Age}_{D0} + \beta 4\,\mathrm{Age}_{D1} + \beta 5\,\mathrm{AgeD2} + \beta 6\mathrm{IncD0} + \beta 7\mathrm{Inc}_{D2} + \beta 8\mathrm{Inc}_{D3} + \beta 9\mathrm{Inc}_{D4} + \beta 10\mathrm{Inc}_{D5} + \beta 11\mathrm{SavD0} + \beta 12\mathrm{SavD1} + \beta 13\mathrm{SavD2} + \beta 14\mathrm{SavD3} + \beta 14\mathrm{SavD4} + \beta 15\mathrm{OcpD0} + \beta 16\mathrm{OcpD1} + \beta 17\mathrm{OcpD2} + \beta 18\mathrm{OcpD3} + \beta 19\mathrm{LocD0} + \beta 20\mathrm{LocD1} + \beta 21\mathrm{LocD2} + \beta 22\mathrm{LocD4} + \beta 23\,\mathrm{LocD5} + \beta 24\mathrm{LocD6} + \beta 25\mathrm{EduD0} + \beta 26\mathrm{EduD1} + \beta 27\,\mathrm{EduD2} + \beta 28\,\mathrm{EduD3} + \beta 29\mathrm{EduD4} + \beta 30\mathrm{ExpD0} + \beta 31\mathrm{ExpD1} + \beta 32\mathrm{ExpD2} + \beta 33\,\mathrm{ExpD3} + \beta 34\mathrm{ExpD4}$$

Whereas β represent coefficient of the regression and other symbols represents the following

RT= Risk tolerance

GenD0 =Female, GenD1=Male

AgeD0=Less than 25 years age, AgeD1=between 25 to 40 years, AgeD2=Greater than 40 years
IncD0=Less than Rs.5 lack, IncD2=Rs. 5 lack to Rs.10 lack, IncD3=Rs. 10 to Rs.15 lack, IncD4=Rs.15 to Rs.20 lack,IncD5=Rs. 20 lack and above
SavD0=Less than 5% of income, SavD1=5% to 10 % of income, SavD2=10% to 20 % of income
SavD3=20% to 30% of income, SavD4=30% and above
OcpD0=Other, OcpD1=Own business or Partnership, OcpD2=Public, OcpD3=Private
LocD0=Lahore, LocD1=Peshawar, LocD2=Islamabad, LocD4=Karachi, LocD5=Quetta, LocD6=Chitral
EduD0=Less than High School, EduD1=High School,
EduD2=Diploma,EduD3=Graduate
EduD4=Post Graduate
ExpD0=Less than 1 year, ExpD1=1 to 3 years, ExpD2=3 to 5 years, ExpD3=5 to 8 years
ExpD4=8 years and above

3.1 Descriptive

This portion of the research is composed of Descriptive statistic and frequencies of the various respondents towards various slabs of demographics as well as investment preferences. The list of the work is explained below

Table 1: Descriptive Statistics

	N	Mean	Std. Dev.	Variance	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
Risk_Tol	382	1.8766	.30641	.094	.112	.125	-.289	.249

The Table 1 shows mean values 1.8766 for Risk tolerance with standard deviation of 0.30, indicates that investors are risk averse in nature and having relative low variance as indicated by the value of standard deviation. The distribution of data is positively skewed while the data is flatykurtic in nature as evidenced by the value of 0.112 and -0.289 for skewness and kurtosis respectively.

Table 2: Descriptive Summary of Demographic Variables

Demographics	Categories	Frequency	Percent	Cumulative Percent
Gender	Male	302	79.1	79.1
	Female	80	20.9	100
Age	Less than 25 Years	265	69.4	69.4
	Between 25 and 40 Years	102	26.7	96.1
	Greater than 40 years	15	3.9	100
Education	Less Than High School	4	1	1
	High School	4	1	2.1

	Diploma	1	0.3	2.4
	Graduate	231	60.5	62.8
	Post Graduate	142	37.2	100
Experience	Less Than 1 Year	254	66.5	66.5
	1 to 3 Years	53	13.9	80.4
	3 to 5 Years	22	5.8	86.1
	5 to 8 Years	27	7.1	93.2
	Greater Than 8 Years	26	6.8	100
Annual Income	Less than 500,000	301	78.8	78.8
	500,000 to 1,000,000	51	13.4	92.1
	1,000,000 to 1,500,000	14	3.7	95.8
	1,500,000 to 2,000,000	5	1.3	97.1
	2,000,000 and Above	11	2.9	100
Annual Saving	Less Than 5% of Income	242	63.4	63.4
	5% to 10% of Income	76	19.9	83.2
	10 to 20% of Income	35	9.2	92.4
	20 to 30% of Income	16	4.2	96.6
	30% and Above	13	3.4	100
Occupation	Private	134	35.1	35.1
	Public	64	16.8	51.8
	Own Business/ Partnership	52	13.6	65.4
	Others	132	34.6	100
Location	Karachi	23	6	6
	Islamabad	217	56.8	62.8
	Peshawar	56	14.7	77.5
	Lahore	34	8.9	86.4
	Quetta	23	6	92.4
	Chitral	29	7.6	100

Table 2 describe the population composition having the highest frequency for male, age less than 25 years, graduate, less than one year experience with less than 5 lack annual income, saving less than 5% of their annual income, privately employed belonging to Islamabad evident by 302,265,231,254,301,242,134,and 217 respectively. Comparatively lowest frequencies are evident from 80,15,1,22,5 13,52,23 for female, agein between 25 and 40 years,diploma,3 to 5 years of experience, 15 to 20 lack annual income, saving of 30 % of annual income, own business/partnership, belonging to Quetta and Karachi respectively.

Table 3: Reliability of the Questionnaire

Variables	Cronbach's Alpha	Items	No of observations
Risk tolerance	0.634	13	382

The table above is showing reliability statistics of 0.634 for risk tolerance composed of 13 items, above than 0.6 stated in the study of Nunnully & Bernstein (1994) showing reliable predictors respectively.

3.2 Correlations

The table 4 shows a positive significant correlation between Risk Tolerance and gender, annual savings and locations exhibited by the values of correlation coefficients of-.153,0.108 and-0.087 at p-values of .003,0.035,and 0.090 respectively except occupation bearing a negative significant relationship shown by its correlation coefficient -0.158 and p-value of 0.002.It is also illustrating an insignificant relationship of Risk Tolerance with Age, experience, annual income, of the respondent as exhibited by the values of correlation coefficients of0.030,0.026 and 0.070with p-values of .564,0.617and 0.174 respectively.

3.3 Regression Results

It is evident from the value of F value equal 568 which is high enough reflecting fitness of the model and adjusted R square represents that 97 percent of the variation in the value of predictor is brought about by the explanatory variable considered in the model given in the table 5.

3.4 Significant relationships of Risk Tolerance with Gender, Savings and Location

Table 5 represents regression result for the Risk tolerance which shows significant results for Gender, Savings and location and the rest of the demographics are exhibiting insignificant results. Other things remaining the same respondents belonging to Male gender are showing significant relation with Risk tolerance with t value of 2.037 greater than 2 and p –value .042 at 5 percent

Table 4: Correlation Matrix

		Risk_Tolerance	Gender	Age	Education	Experience	Annual Income	Annual Saving	Occupation	Location
Risk_Tolerance	Pearson Correlation	1								
	Sig. (2-tailed)									
Gender	Pearson Correlation	-.153**	1							
	Sig. (2-tailed)	.003								
Age	Pearson Correlation	.030	-.182**	1						
	Sig. (2-tailed)	.564	.000							
Education	Pearson Correlation	.070	-.024	.201**	1					
	Sig. (2-tailed)	.172	.647	.000						
Experience	Pearson Correlation	.026	-.114*	.566**	.065	1				
	Sig. (2-tailed)	.617	.026	.000	.208					
AnnualIncome	Pearson Correlation	.070	-.007	.130*	-.042	.195**	1			
	Sig. (2-tailed)	.174	.895	.011	.416	.000				
AnnualSaving	Pearson Correlation	.108*	-.065	.220**	.060	.263**	.457**	1		
	Sig. (2-tailed)	.035	.202	.000	.246	.000	.000			
Occupation	Pearson Correlation	-.158**	.060	.115*	.074	.154**	.032	.106*	1	
	Sig. (2-tailed)	.002	.245	.024	.146	.003	.536	.038		
Location	Pearson Correlation	-.087	.015	-.028	-.125*	.117*	.096	.148**	.106*	1
	Sig. (2-tailed)	.090	.769	.585	.014	.022	.060	.004	.039	

Table 5: Regression Model Summary for Risk tolerance

Model Summary and ANOVA

Model	R	R Square	F	Sig.
1	0.989	0.978	568.000	.000

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age_D1	-.054	.042	-.015	-1.290	.198
Age_D2	.022	.098	.002	.221	.825
Gen_D1	-.079	.039	-.019	-2.037	.042
Edu_D	-.067	.158	-.004	-.424	.672
Edu_D1	-.210	.152	-.011	-1.380	.169
Edu_D2	.189	.296	.005	.638	.524
Edu_D4	.025	.035	.008	.703	.482
Exp_D1	.010	.047	.002	.219	.827
Exp_D2	-.050	.072	-.006	-.692	.489
Exp_D3	.027	.069	.004	.398	.691
Exp_D4	-.003	.076	.000	-.035	.972
Inc_D1	.038	.051	.007	.749	.454
Inc_D2	.003	.089	.000	.033	.973
Inc_D3	-.077	.144	-.005	-.533	.594
Inc_D4	.086	.097	.008	.890	.374
Sav_D1	.120	.042	.028	2.886	.004
Sav_D2	.075	.062	.012	1.208	.228
Sav_D3	-.031	.084	-.003	-.376	.707
Sav_D4	.158	.091	.015	1.741	.082
Ocp_D1	-.011	.050	-.002	-.224	.823
Ocp_D2	-.104	.055	-.020	-1.886	.060
Ocp_D3	-.077	.039	-.024	-1.978	.049
Loc_D1	1.941	.033	.769	58.866	.000
Loc_D2	1.745	.053	.351	33.234	.000
Loc_D3	1.794	.063	.281	28.532	.000
Loc_D4	1.900	.074	.245	25.697	.000
Loc_D5	1.944	.062	.282	31.413	.000
Loc_D	1.999	.069	.258	29.155	.000

a. Dependent Variable: Risk_ Tolerance

b. Linear Regression

confidence level. Whereas the coefficient of -0.79 exhibit a variation from one gender to another will bring a negative variation of -0.79 time in Risk tolerance that is chasing less risky assets as shown by negative sign of the coefficient. Keeping other things equal Annual Savings at level of 5 to 10 percent of income are showing significant relationship with Risk Tolerance shown by t-value 2.886, greater than 2 and P-value of 0.004. Whereas the coefficient of 0.120 D1 (5 percent to 10 percent of income) exhibit a variation from one level of income to another will bring a positive variation of 0.120 time in Risk tolerance that is more towards chasing risky choices.

Demography of belonging to any location of Pakistan are exhibiting a positive significant relationship with Risk tolerance other things constant evident from t values of 58,33,28,25,31 and 29 >2 and p-value 0.0000.Whereas the coefficient of 1.941, 1.745, 1.794, 1.900, 1.944, and 1.999 belongingness to Karachi, Lahore, Peshawar, Islamabad, Quetta and Chitral exhibit a variation from one place to another place will bring a positive variation of 1.941, 1.745, 1.794, 1.900, 1.944, and 1.999 time in Risk tolerance that is more towards opting risky tolerance while making investment as evident from the positive coefficient sign.

3.5 Insignificant relationship of Risk Tolerance with Age, Education, Experience, Income and Occupation

Table 5 shows the coefficients of -0.054,0.022,0.025at age less than 25 and 25 to 49 years with Risk tolerance can be interpreted as a variation of age from one level to another will bring -0.054and 0.022times variations in risk tolerance respectively keeping other factors constant. The coefficients of -.067, -.210, 0.189, and 0.025of education with risk tolerance can be interpreted as a variation of education from one level to another will bring-.067, -.210, 0.189, and 0.025 times variations in Risk tolerance respectively other factors remaining the same. The coefficients of .010,-.050, .027and -.003of experience with risk tolerance can be interpreted as a variation of experience from one level to another will bring .010,-.050, .027 and -.003times variations respectively in Risk tolerance keeping other factors constant. The coefficients of 0.038,0.003,-0.077, 0.086 of income with risk tolerance can be interpreted as a variation of income from one level to another will bring0.038,0.003,-0.077, 0.086times variations in Risk tolerance respectively keeping other things same. The coefficients of -.104 and -.077of occupation with Risk tolerance can be interpreted as a variation of occupation from one level to another will bring-.104 and -.077 times variations in Risk tolerance keeping other factors constant respectively.

4. Conclusions

There is a significant correlation between risk tolerance and three of the demographic variables like gender, saving and occupation. But the study shows negative correlation with gender and occupation showing that employed males are less risk tolerant. Thus Savings is concluding a significant relationship with risk tolerance showing that any individual with some saving will go for preferring investment in less risky, moderate risk options in Pakistan. Age is irrelevant in their investment choices whereas location is also mattering in their investment choices. Individual belonging to any of the location concerning the study sample in Pakistan will go for preferring investment in less risky options in Pakistan.

Education is irrelevant in their risk tolerance and modes of investment preference. Experience is irrelevant in case of risk tolerance. Individual with some experience will opt for tangible assets and conventional assets investments whereas Experience, incomes and occupation have an insignificant relationship with risk tolerance. The study is sharing some of its findings with (Grable & Joo, 2000; Hanna et al., 1998)exhibiting a significant relationships of Risk Tolerance with gender, savings and location. Similarly the study of Riley Jr and Chow (1992), andMcInish et al. (1993) is in support of the current research showing insignificant relationship of age and investment preferences.

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