

Overconfidence and Loss Aversion in Investment Decisions: A Study of the Impact of Gender and Age in Pakistani Perspective

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Abstract

This study investigates the impacts of gender and age on two of the behavioral biases i.e. over confidence and loss aversion with reference to Pakistan. We used questionnaire based survey method to collect data from a sample amounting to 391 individuals. Chi-square analysis, OLS and correlation analysis have been used to estimate the models under study. The findings revealed men and older investors to be more overconfident whereas women and older investors to be more loss averse. Similarly, the results indicate that those who prefer risk are likely to be more over confident. The limitations include time and geographical constraints as well as unavailability of data. In the add, some recommendations have been made that could help researchers in their future works.

Keywords: Behavioral biases, Gender and Overconfidence, Loss Aversion and Behavioral Finance Micro (BFMI).

1. Introduction

This work has been carried out in order to analyze the impact of demographics like gender and age on behavioral biases like overconfidence and loss aversion in Pakistani perspective as only a small number of researchers have endeavored to focus on this problem here. This lack of research is mainly due to the difficulty faced to find data through brokerage houses or even through individual respondents. This has resulted in lack of evidence regarding these individual biases. That is why it is of utmost importance that works should be performed on behavioral finance so as to help the stock market to prosper in Pakistan and take this country out of the crises. The findings of this research may help finance professionals to educate investors.

“People in standard finance are rational. People in behavioral finance are normal” (Statman, 1999). “Behavioral finance, commonly defined as the application of psychology to finance, has become a very hot topic, generating new credence with the rupture of the tech-stock bubble in March of 2000” (Pompian, 2011). Many are still unable to grasp its true concept so to make it easier, it has been divided into two sub-concepts behavioral finance micro (BFMI) and behavioral finance macro (BFMA). BFMA is concerned with stock market anomalies whereas BFMI focuses on investor biases. These biases are of many types but we are going to focus only on the two most prominent and popular of them i.e. Over confidence and Loss Aversion.

By over confidence, we mean to point out the individuals’ faith in their cognition, intuition and decision making. By being over confident one forgets that one can make mistakes just like others do and starts over estimating themselves. “Too many people overvalue what they are not and undervalue what they are” (Chernoff, 2010). Resultantly they enter into a habit of self attribution where they take credit of their successes while putting the blame of failures on external factors; and such people have a motto like “Heads I win, tails it’s chance” (Langer, 1975). Over confident people misinterpret their own knowledge, donot heed others and indulge in excessive trading thereby causing lower returns. Ralph Waldo Emerson most appropriately defined knowledge as “Knowledge is knowing that we cannot know”. As rightly described by Josh Billings, “It’s not what a man don’t know that makes him a fool, but what he does know that ain’t so”.

Another of investor biases has been termed as Loss Aversion in which investors prefer to avoid risk (i.e. risk aversion) and try to invest where they get the surety to have positive returns. Literature provides evidence that females are less overconfident and more loss averse than males. Also young investors have been witnessed to be more over confident and have a love for risk taking as compared to older ones. Ralph Waldo Emerson motivated those who avoid risk by saying “Our greatest glory is not in never failing, but in rising up every time we fail”.

Odean (1998) argued that excessive trading is taking place in stock exchange which as a consequence is resulting in low returns for the traders and this hyper trading is due to the overconfidence of the traders. He also examined the return levels in the stock exchange and witnessed a demand for more volatile securities. Barber and Odean (2001) used the data from brokerage houses to identify the existence of overconfidence among investors emphasized by gender in financial decisions. They found out that males are far more overconfident than are females and presence of overconfidence also impacts the level of trading activity in a positive manner. Their focus was investments in the stock exchange.

Powell, Schubert and Gysler (2001) found out that the level of loss aversion in females is far much higher than that in males as they prefer to take lower level of risks. Gender is one of the strongest influencers that predict the level of over confidence and the degree to which risk is avoided for individual investors as also debated by

Gysler, Kruse and Schubert (2002). Wasterholm and Ollila (2003) concluded through their work on Finnish investors that men, especially younger men, tend to be more over confident and less loss averse as compared to women. Also young men trade more frequently which results in their lower returns. Dittrich, Güth and Maciejovsky (2005) indicated that higher level of risk taking also takes over confidence to a higher level. "There is abundant evidence that most people most of the time are overconfident in the sense that they over estimate the precision of their knowledge, a phenomenon known as miscalibration" (Deaves, Lüders & Schröder, 2005). The status or position a person holds in a setting is also a catalyst for over confidence and risk preference as Malmendier and Tate (2005) observed high level of over confidence and lower loss aversion among the executives of different organizations. Matters (2008) advocated the concept of behavioral finance by saying that investors are certainly influenced by their emotions and cognitions while making investment decisions and by saying that they are rational one is completely ignoring strong facts and reality. He discussed cultural differences in order to provide evidence in support of behavioral finance. Park, Konana, Gu, Kumar and Raghunathan (2010) studied the impact of confirmation (i.e. confirmation bias) over confidence in investors which is negatively impacting their returns. They found a positive yet significant association between the two biases under study. Michailova (2010) studied financial decisions made by individual investors in the light of biases like over confidence and loss aversion. Their results found women more over confident as compared to men but the findings for loss aversion were insignificant for them. "Moreover, men appear to be less risk-averse than women" (Wann & Lobo, 2010). Also the more young the men are, the more mistakes they are likely to make due to their over confidence. On the other hand, females have somewhat more precautionary plan of action for trading. Trinugroho and Sembel (2011) debated that over confident investors perform excessive trading due to their believe that they know it all consequently they get lower returns as compared to others as the amount of their profits is somewhere near to that of losses. Alrabadi, AL-Gharaibeh and Ziad (2011) used survey data in order to scan for the reasons behind ASE's investor over confidence and found experience to be a catalyst. According to Albaity and Rahman (2012), female psychology differs to that of males so as the decisions made by each. They worked on the biases like over confidence in the light of demographics of investors. "It is generally argued that overconfidence bias makes the market less efficient, because it created mispricing in the form of access volatility and the overestimation of one belief about its precision in price predictions" (Khurshid, 2012). Albaity and Rahman (2012) studied the impact of demographics including gender on loss aversion and over confidence and found a significant association of the demographics with each of the explained variables in Malaysian context. Hoffman and Post (2012) indicated that investors having high risk preference continue to prefer risk whatsoever form their returns take. Cronqvist and Siegel (2012) studied loss aversion in investors in the light of genetic differences under the impact of certain personality traits including experience and knowledge, etc. Theorists like Ziane & Abaoub (2009) and Zaiane (2013) concluded excessive trading to be an indicator of over confidence among investors. Bashir, Azam, Butt, Javed and Tanvir (2013) studied the impact of demographic variables including age and gender, etc. upon certain biases that are prominent in behavioral finance including over confidence, etc. plus risk behavior; and witnessed a significant association among them. Jakobsson, Levin and Kotsadam (2013) investigated behavioral bias, over confidence with regards to the gender, in school students of Sweden and Salvador. They provided the evidence that male students tend to be overconfident where as female students were under confident. Also this under confidence was less intense in girls studying in co-education. Ali, Saleem, Ali and Akram (2013) compared and contrasted the traditional finance with the behavioral finance by highlighting de-merits of traditional one. They explained the biases in the behavioral finance and used the data collected through questionnaire based survey that was administered on people investing in KSE. They provided strong substantiation that behavioral finance makes much more sense as compared to traditional one at least in BFMI. Bashir, Javed, Ali, Meer and Naseem (2013) investigated the financial decisions made by the investors in the light of seven prominent biases of behavioral finance micro. They found the impact of some biases, over confidence among them, significant where as that of other biases including loss aversion was insignificant. Sharma and Vasakarla (2013) used chi-square analysis in order to study the association among gender and two of the biases of behavioral finance i.e. over confidence and risk aversion and found women to be more risk averse whereas they do not found a significant relationship between gender and over confidence bias. Bayyurt, Karışık and Coşkun (2013) interpreted forex trends in order to find out the gender influences but found no significant influence of any gender that may differ it from other in financial decision making.

2. Method

1.1 Participants and Procedure

In order to collect data, self administered questionnaire based survey method has been used comprising of ten questions. We conducted the pilot study on fifty participants out of which 23 were males and 27 were females. The target population for our study comprises of all the people who can be categorized as investors in Pakistan and they become a total of approximately 50 million at maximum. So we used a sample of 450 for our final data

collection comprising of households, professors and employees of firms like Ufone, Tollink, Ericson and FFBL, etc. i.e. all accessible within twin cities of Pakistan. 59 participants refused to fill the questionnaires out of which 238 were males i.e. 61% while 153 were females i.e. 39%.

1.2 Measures

The questions were adopted from Sharma and Vasakarla (2013) with slight amendments of wordings as well as scale. The amended questionnaire was approved by some PhD scholars skilled in research. The questionnaire, as depicted in Appendix-A, contained ten questions in total; two for gender and age whereas four items each for loss aversion (constructed using ordinal scale) and overconfidence (constructed using likert scale). The cronbach alpha for the pilot study has been observed to be 0.609 where as for final survey as 0.730.

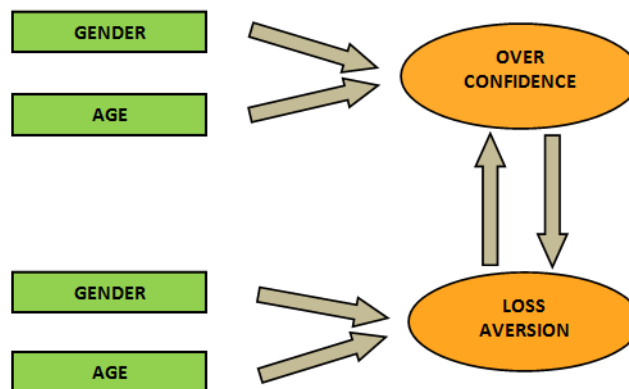
1.3 Analysis techniques

For analysis of the data collected, we have used chi-square analysis as also used by Sharma and Vasakarla (2013); and regression along with correlation analysis as also used by Bashir et. al (2013), are used to estimate the impact of gender and age on two behavioral biases namely over confidence and loss aversion. The models to be tested using OLS are:

$$\text{Over Confidence} = \beta_0 + \beta_1\text{Gender} + \beta_2\text{Age} + \epsilon_i \quad \dots\dots (1)$$

$$\text{Loss Aversion} = \beta_0 + \beta_1\text{Gender} + \beta_2\text{Age} + \epsilon_i \quad \dots\dots (2)$$

Where over confidence and loss aversion are our dependent variables whereas gender and age are explanatory ones; β_0 is the intercept whereas β_1 and β_2 are coefficients for gender and age. ϵ_i is the error term depicting other factors influencing each of the biases. The pictorial representation of the models mentioned above has been displayed below:



With the help of the topic under study and the literature surfing, the following five hypotheses have been formulated by us:

- Ho1: Gender and over confidence are not correlated.
- Ho2: Gender and loss aversion are not correlated.
- Ho3: People who are overconfident do not tend to be less loss averse.
- Ho4: Males do not tend to be more over confident.
- Ho5: Young people do not tend to be more over confident
- Ho6: Females do not tend to be more loss averse.
- Ho7: Older people do not tend to be more loss averse.

3. Results

Table 1 demonstrates the count and percentage for each gender out of total respondents. Out of the sample of 391, approximately 61% i.e. 238 are males whereas the remaining 39% i.e. 153 are females.

Table - 1

GENDER	#	%
male	238	60.9
female	153	39.1
Total	391	

Table 2 demonstrates the age division for each gender out of their total. It tells that 66% males and 79% females fall in the age bracket of (21-33); 26% males and 17% females fall in the age bracket of (34-47); 6% males and 3% females fall in the age bracket of (48-60) while the remaining 3% males and 1% females fall in the age bracket of (above 60).

Table - 2

GENDER		Age				Total
		21-33	34-47	48-60	ABOVE 60	
MALE	#	156	61	15	6	238
	%	65.5	25.6	6.3	2.5	
FEMALE	#	121	26	4	2	153
	%	79.1	17.0	2.6	1.3	
Total						391

In order to prove the significance of chi-square analysis, we have calculated the Pearson chi-square for each item as well as both the biases under study along with their degree of freedom and level of significance as displayed in Appendix-B. Table 3 demonstrates the risk preference for each gender out of their total. It tells that 27% males and 19% females are avoid risk; 58% males and 49% females are neutral about risk while the remaining 16% males and 32% females love to take risk. There are significant differences in responses related to risk preference between gender at 1% level of significance with $\chi^2 = 14.3$, $df = 2$ and $p = 0.001$.

Table - 3

GENDER		Risk Preference			Total
		Averse	Neutral	Lover	
MALE	#	63	137	38	238
	%	26.5	57.6	16.0	
FEMALE	#	29	75	49	153
	%	19.0	49.0	32.0	
Total					391

Table 4 demonstrates the investment preferences, if have excess money available to them, arranged according to the ascending order of their underlying level of risk for each gender out of their total. It tells that 28% males and 14% females prefer bank accounts; 35% males and 35% females prefer forex or gold investments while the remaining 37% males and 51% prefer other riskier investments. There are significant differences in responses related to investment preferences between gender at 1% level of significance with $\chi^2 = 12$, $df = 2$ and $p = 0.002$.

Table - 4

GENDER		Rs. 500,000 excess			Total
		Bank Account	Forex/Gold	Other	
MALE	#	66	85	87	238
	%	27.7	35.7	36.6	
FEMALE	#	22	53	78	153
	%	14.4	34.6	51.0	
Total					391

Table 5 demonstrates the tolerance of loss after suffering from it once for each gender out of their total. It tells that 19% males and 10% females completely avoid loss after facing it once; 43% males and 36% females take moderate risk after suffering from loss once while the remaining 38% males and 54% females take risk optimistically even after facing loss. There are significant differences in responses related to loss tolerance between gender at 1% level of significance with $\chi^2 = 11.5$, $df = 2$ and $p = 0.003$.

Table - 5

GENDER		Lost Rs. 1000 in a game			Total
		Be Contended	50% to win 500	25% to win 1000	
MALE	#	45	102	91	238
	%	18.9	42.9	38.2	
FEMALE	#	15	55	83	153
	%	9.8	35.9	54.2	
Total					391

Table 6 demonstrates the risk taking ability for each gender out of their total. It tells that 16% males and 11% females are reluctant about risk; 40% males and 35% females take moderate level of risk while the remaining 44% males and 54% females are extremely optimistic about risk. There are significant differences in responses related to risk taking ability between gender at 10% level of significance with $\chi^2 = 4.8$, $df = 2$ and $p = 0.089$.

Table - 6

GENDER		Rs. 2000,000 inheritance			Total
		70% low risk	50% low risk	25% low risk	
MALE	#	38	96	104	238
	%	16	40.3	43.7	
FEMALE	#	16	54	83	153
	%	10.5	35.3	54.2	
Total					391

Table 7 demonstrates the investment frequency for each gender out of their total. It tells that 8% males and 19% females never invest; 15% males and 26% females rarely invest; 39% males and 30% females have moderate frequency of investment; 24% males and 18% females invest very often while the remaining 15% males and 7% females are regular investors. There are significant differences in responses related to investment frequency between gender at 1% level of significance with $\chi^2 = 22.9$, $df = 4$ and $p = 0.000$.

Table - 7

GENDER		Investment Frequency					Total
		Never	Rarely	Sometimes	Very Often	Regularly	
MALE	#	19	35	92	56	36	238
	%	8.0	14.7	38.7	23.5	15.1	
FEMALE	#	29	39	46	28	11	153
	%	19.0	25.5	30.1	18.3	7.2	
Total							391

Table 8 demonstrates the participants' views about their abilities to tackle others for each gender out of their total. It tells that 3% males and 5% females claim their abilities to be poor; 7% males and 12% females claim their abilities to be below average; 34% males and 35% females marked themselves as average; 33% males and 32% females claim their abilities as above average while the remaining 22% males and 16% females marked themselves as excellent. There are no significant differences in responses related to abilities' estimation between gender with $\chi^2 = 5.7$, $df = 4$ and $p = 0.222$.

Table – 8

GENDER		Ability to cope & interact with people					Total
		Poor	Below Avg	Average	Above Avg	Excellent	
MALE	#	8	17	81	79	53	238
	%	3.4	7.1	34.0	33.2	22.3	
FEMALE	#	8	19	53	49	24	153
	%	5.2	12.4	34.6	32.0	15.7	
Total							391

Table 9 demonstrates the participants' views about their understanding of what is right for them for each gender out of their total. It tells that 1% males and 5% females claim their understanding to be poor; 6% males and 12% females claim their intuition to be below average; 24% males and 34% females marked themselves as average; 49% males and 40% females claim their understanding as above average while the remaining 20% males and 10% females marked themselves as excellent. There are significant differences in responses related to intuition estimation between gender at 1% level of significance with $\chi^2 = 18.1$, $df = 4$ and $p = 0.001$.

Table - 9

GENDER		Understanding of what is good					Total
		Poor	Below Avg	Average	Above Avg	Excellent	
MALE	#	3	15	57	116	47	238
	%	1.3	6.3	23.9	48.7	19.7	
FEMALE	#	7	18	52	61	15	153
	%	4.6	11.8	34.0	39.9	9.8	
Total							391

Table 10 demonstrates the participants' views about their vision clarity for each gender out of their total. It tells that 2% males and 5% females claimed their clarity to be poor; 7% males and 10% females claimed their clarity to be below average; 19% males and 26% females marked their clarity as average; 43% males and 34% females claimed their clarity to be above average while the remaining 29% males and 39% females marked their clarity as excellent. There are significant differences in responses related to clarity of vision between gender at 10% level of significance with $\chi^2 = 7.8$, $df = 4$ and $p = 0.098$.

Furthermore the for overall overconfidence, there are significant differences in responses between gender at 5% level of significance with $\chi^2 = 29.2$, $df = 16$ and $p = 0.023$. Whereas for overall loss aversion, there are significant differences in responses between gender at 1% level of significance with $\chi^2 = 24.0$, $df = 16$ and $p = 0.002$.

Table - 10

GENDER		Clarity of vision in life					Total
		Poor	Below Avg	Average	Above Avg	Excellent	
MALE	#	5	16	46	103	68	238
	%	2.1	6.7	19.3	43.3	28.6	
FEMALE	#	8	15	39	52	59	153
	%	5.2	9.8	25.5	34.0	38.6	
Total							391

Table 11 demonstrates correlation analysis and the results depict that over confidence has negative yet low correlation with loss aversion and gender at 99% confidence level for each having $r = -0.281$ and -0.224 , respectively; and $p = 0.000$. Whereas overconfidence is positively slightly correlated with age at 99% confidence level having $r = 0.189$ and $p = 0.000$. However loss aversion is slightly positively correlated with gender and age at 99% and 90% confidence level having $r = 0.222$ and 0.086 and $p = 0.000$ and 0.088 , respectively. Similarly, gender has low yet negative correlation with age at 99% confidence level having $r = -0.142$ and $p = 0.005$.

Table - 11

* indicates significance at 0.10 level, ** at 0.05 level and *** at 0.01 level

BIAS		Over Confidence	Loss Aversion	Gender	Age
Over Confidence	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	391			
Loss Aversion	Pearson Correlation	-0.281***	1		
	Sig. (2-tailed)	0.000			
	N	391	391		
Gender	Pearson Correlation	-0.224***	0.222***	1	
	Sig. (2-tailed)	0.000	0.000		
	N	391	391	391	
Age	Pearson Correlation	0.189***	0.086*	-0.142***	1
	Sig. (2-tailed)	0.000	0.088	0.005	
	N	391	391	391	391

Table 12 demonstrates the results of the regression analysis for the two models. For model (1), gender and age have a 27.4% impact on overconfidence while the remaining 72.6% impact is of residuals with the value of F-statistic = 15.776 significant at 1%. Hence, the model is appropriately specified. Also, the results indicate that 1 unit increase in the value of gender decreases overconfidence by 0.321 units with t-statistic = -4.078 significant at 1%. Similarly, 1 unit increase in the value of age increases overconfidence by 0.184 units with t-statistic = 3.244 significant at 1%.

For model (2), gender and age have a 25.2% impact on loss aversion while the remaining 74.8% impact is of residuals with the value of F-statistic = 13.112 significant at 1%. This model is also appropriately specified. Also, the results indicate that 1 unit increase in the value of gender increases loss aversion by 0.249 units with t-statistic = 4.810 significant at 1%. Similarly, 1 unit increase in the value of age increases loss aversion by 0.091 units with t-statistic = 2.423 significant at 5%.

Table - 12

** indicates significance at 0.05 level and *** at 0.01 level

BIAS		Gender	Age	R	F-value	p-value
Over Confidence	coefficient	-0.321	0.184	0.274	15.776	0.000***
	t-value	-4.078	3.244			
	p-value	0.000***	0.001***			
Loss Aversion	coefficient	0.249	0.091	0.252	13.112	0.000***
	t-value	4.810	2.423			
	p-value	0.000***	0.016**			

4. Discussion

The chi-square analysis showed that the participants' responses depict significant differences between genders with reference to over confidence. Hence, we find the evidence that there is a strong association between gender and over confidence. Therefore we reject Ho1. Similarly, responses depict significant differences between genders with reference to loss aversion. Hence, we get the substantiation that there is a strong association between gender and loss aversion. Therefore we reject Ho2. Sharma and Vasakarla (2013) also used chi-square analysis in order to study the association among gender and two of the biases of behavioral finance i.e. over confidence and risk aversion and found women to be more risk averse whereas they do not found a significant relationship between gender and over confidence bias.

The results obtained through correlation analysis illustrate that increase in overconfidence causes decrease in loss aversion. This means that people who are more over confident do not avoid losses instead they like to take risks frequently. Hence, we reject Ho3. Also we found out that males and older investors are more overconfident. Similarly, older women are more risk averse. Other theorists like Levi, Li & Zhang (2011) and Pandey (2013) also concluded males to be more over confident than females.

More importantly, through the results of regression analysis we conclude that decrease in gender causes increase in overconfidence that is to say that males are far more overconfident. This may be because that Pakistan is a male dominated society and females are more criticized for their mistakes than are men so women start under estimating themselves. Also increase in age causes over confidence to increase i.e. older people are more over confident. The reason for this lies perhaps in the experience and knowledge gained by older people during their

life that makes them to overestimate their cognition and invest more frequently. Hence, we reject Ho4 but accept Ho5.

Also the results depicted that increase in gender causes increase in loss aversion meaning females are far more loss averse. D'Acunto (2013) searched for the reasons that contribute to a higher level of over confidence in males as compared to females. He found out that being overconfident makes men to love more risk as well as invest more i.e. resulting in a decrease in their loss aversion. Similarly, increased age cause increased loss aversion depicting that older people are more loss averse. This may be due to the fact that older people spend their life in saving the excess and they simply cannot let their money to vanish. So, we reject both Ho6 and Ho7.

5. Conclusion

Gender is a demographic that has a prominent impact on behavioral biases like overconfidence and loss aversion. Our research findings supported this theory and provided some new insights into the psychology of Pakistani investors. Hence, we conclude that in Pakistan, men are more over confident whereas women are more loss averse. Older investors are both overconfident and majority of them trade excessively here. Also in Pakistan, people who prefer risks are generally observed to be more overconfident.

We had to face many hurdles while conducting this research and this was the reason that we focused on just two of the biases. A few most important ones among limitations are: firstly, we had time constraints; secondly, we had geographical constraints; thirdly, people were very reluctant to share their views even though our questionnaire ensured privacy; and finally, our brokerage houses are not developed enough to provide us with required secondary data. So, we recommend theorists to adopt a wider focus on biases in future and targeting other areas apart from the twin cities.

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Appendix

A. Questionnaire

1. Gender			
1. Male	2. Female		
2. Age:			
1. 21-33	2. 34-47	3. 48-60	4. Above 60
3. Risk preference			
3. Risk Averse	2. Risk Neutral	1. Risk Lover	
4. You have Rs. 500,000 excess, where would you prefer to invest?			
3. Bank Account (Fixed/Saving)	2. Forex/Gold	1. Other	
5. You lost Rs. 1000 in a game and have to choose one of the three alternatives, which one you would prefer?			
3. Be contented with your loss and do nothing			
2. 50% chance to win Rs.500 and a 50% chance to lose an additional Rs.500			
1. 25% chance to win Rs.1000 and a 75% chance to lose an additional Rs.1000			
6. Suppose you inherited Rs. 2,000,000; which investment option would you choose?			
3. 70% in low risk, 20% in medium risk, 10% in high risk			
2. 50% in low risk, 35% in medium risk, 15% in high risk			
1. 25% in low risk, 15% in medium risk, 60% in high risk			
1. Never to 5. Regularly			
7. How frequently you invest?			
1. Poor to 5. Excellent			
8. Your ability to cope & interact with people?			
9. Your understanding of what is good?			
10. Your clarity of vision in life?			

B. Chi-square Analysis

* indicates significance at 0.10 level, ** at 0.05 level and *** at 0.01 level

	Gender		
	Pearson χ^2	df	p-value
Risk Preference	14.3	2	0.001***
500000 excess	12.0	2	0.002***
lost 1000 in a game	11.5	2	0.003***
inherited 2000000	4.8	2	0.089*
frequency of investment	22.9	4	0.000***
ability to cope & interact	5.7	4	0.222
understanding of good	18.1	4	0.001***
clarity of vision	7.8	4	0.098*
over confidence	29.2	16	0.023**
loss aversion	24.0	8	0.002***

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