Determinants of Risk Taking Behavior of Stock Brokers: The role of Demographic Characteristics of Stock Brokers on Portfolio Management

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ABSTRACT

Behavioral finance focuses on psychological factors—such as risk perception and portfolio management that play a crucial role in investors' financial decision making. The study investigates the risk-taking behavior of the brokers with respect to the demographic factors namely age, education and experience while making investment decisions. This study has used three demographic factors namely Age, Education and Experience of broker's and their risk-taking behavior has been used while making investment. The population of the study is 305 brokers registered in Pakistan Stock Exchange in which sample size of 170 brokers filled up questionnaires. Questionnaire was shared via Google doc with all 305 brokers and time to time reminders were given to them, so they could response soon. Survey methodology has been used in this study. Each respondent (Broker) had been given a questionnaire to be filled up in which 170 questionnaire forms received back. The survey forms contained 16 questions related to age, education, and experience and risk behavior of the brokers while making investment. Descriptive statistics and ONE-WAY ANOVA used for the purpose of analysis. The study concluded that brokers risk taking behavior has a relationship with the demographic factors (age, education and experience) while making investment decisions so the brokers have not been completely rational individuals as assumed by the traditional theory of finance.

1.1: Introduction

An investment decision always includes the sacrifice of immediate benefits for better future returns. An investment is always made with certain specific objectives in mind. These objectives are primarily classified as the primary and secondary objectives. While the primary objectives revolve around the risk and return part of an investment decision, the secondary objectives include the safety against inflation, liquidity, growth, tax benefit etc. Investment decisions are mostly affected by external as well as internal factor of investor itself. Traditional individual characteristic was not considered in investment decision making and preference was given to rational decision making (Bashir, Uppal, Hanif, Yaseen, & Saraj, 2013).

With study of behavior finance the research community also starts taken account of bounded rationality. The decision may be made through intuitive and heuristic. Investment decisions are made by investors but for taking stock investment decision investors need assistance of a person called Stock Brokers. Stock brokers play a basic part in stock market. A stock broker is an expert and skillful who deals in buying and selling stocks and also deals other securities on behalf of stock investors in the stock market (Bashir, Shaheen, Batool, Hassan Butt, & Javed, 2014)

This study aim is to dig out the effect of an individual broker on investment and his risk-taking ability due to demographic factors like age, education and investment experience of the broker. The study gives evidence that the demographic factors are associated with the investment choice and depends on it. (Bashir et al., 2013)

When the historical development of the theories on investment activities is examined, it is discovered that the traditional portfolio approach was the dominant approach in the market until the 1950s. Although this approach lacked a scientific base, it is seen that it was the dominant view in the market for a long-time due to the fact that its feasibility was relatively easy (Civan, 2007). In the traditional investment conception, the investors think that they can decrease the risk just by increasing the number of investment instruments they have without considering the relations between the yields of investment instruments (Demirtaş and Güngör, 2004). In the traditional investment approach, the investors are recommended to invest in the instruments with a high yield possibility; however, they are not informed about how the

risk will be measured. The mean values of yields realized in the past are defend as expected return (Reilly and Ve Brown, 1999). What is assigned importance in the traditional investment conception is how investors should behave instead of studying how they behave (Sönmez, 2010).

1.3: Research Questions

1. What is the impact of demographic characteristics on risk perception of stock brokers?
2. What effect do demographic factors have on portfolio management by stock brokers?

1.4: Research Objective

1. To find out the relationship between demographic factor and risk perception
2. To find out the relationship between demographic factor and portfolio management

1.5: Significance of the study

This study has the significance for the individual investors to know the demographic factors (age, education and experience) which affect their investment decisions. This study reveals the broker's demographics and their risk-taking behavior while making investment decisions. This study provides evidence that the broker's investment decisions are affected by the demographic variables such as age, experience and education. The interruption of the biases can be avoided if brokers take steps by gaining knowledge about the biases while making investment decision.

2. Literature Review

2.1: Behavioral finance and Psychological biases

Behavioral finance has got importance in last two decades; therefore, researchers are curious to know the role of behavioral aspect in individual investor's investment decision making process. When we examined relevant literature, factors influencing individual investors' attitude were classified into two groups, namely social and economic factors, in general. But recent literature put emphasis on social factors in general and behavioral factors (psychological biases and personality traits) in

particular that affect investors' decisions, as the fluctuations in financial markets could not be explained with the principal doctrines of finance literature.

Factors that determine the risk-associated attitudes of individual investors are of great concern within the discipline of behavioral finance, which looks at character attributes (e.g., mental) that play a key function in funding and financial choices. risk refers back to the uncertainty associated with a final result and arises when there are doubts about at the least one feasible outcome. Assessing the level of danger includes perceiving its state, which shows that the notion is defined by means of objective realism (Bashir et al., 2014)

Psychological biases and personality traits affecting investment behaviour are over significance, risk tolerance, self-monitoring and social influence (Kourtidis et al., 2011). Nagy and Obenberger (1994) conducted a survey on determining the underlying criteria that affect decisions of individual equity investors with substantial holdings in fortune 500 firms. According to empirical evidence, wealth-maximization criteria were found significant among respondents while the effect of recommendations of brokerage houses, individual stock brokers, family members and co-workers were identified as insignificant.

Sitkin and Pablo (1992) and Sitkin and Weingart (1995) argue that an individual's danger-taking movement is affected in particular with the aid of chance notion and attitude. Weber and Hsee (1998) record that individual decision-making is inspired by way of danger perception inside the case of investment choices inside the bonds market. Vlaev, Chater, and Stewart (2009) examine investors' choices for wonderful approaches of transmitting hazard-related records and notice that hazard supplied in phrases of a median maximum (fine) or minimum (worst) is deemed leading. Slovic (2000) factors out that chance is inherently subjective: the method of hazard belief connotes a goal scenario that is itself formed by using revel in, feelings, and expertise.

Prabhakaran and Karthika (2011) show that traders with a higher danger tolerance are much more likely to make portfolio decisions. danger tolerance therefore has a right away effect on buyers' funding selections and determines the composition of various belongings in the portfolio. person buyers' chance tolerance may exchange over

the years on account that it's miles stimulated by means of diverse exogenous factors, for instance, main life studies (Cordell, 2002).

Kiran and Rao (2005) examined whether demographic and psychographic variables were effective on risk-bearing capacity of Indian investors by conducting a sampling survey. By analyzing the collected data through multinomial logistic regression and factor analysis (FA) of SPSS, they verified a strong relationship between risk taking attitude and demographic and psychographic variables.

Goodfellow et al. (2009) investigated institutional and individual investors' trading behaviour by testing for the presence of herding on the Polish stock market from July 1996 to November 2000. According to empirical evidence, contrary to institutional investors, individual investors exhibited herding during market downswings and to a lesser extent also in market upswings which implied that individual investment decisions were prone to sentiment during market stress, while they mostly trusted their beliefs and information when stock prices rose.

Bennet et al. (2011) sought to identify various factors that influence retail investors' attitude towards investing in equity stock markets. They applied a structured questionnaire to retail investors in Tamil Nadu, India. Collected data were analyzed through descriptive statistics and FA. According to the test results, out of the total 26 variables, it was found out that fve factors (investors' tolerance for risk, strength of the Indian economy, media focus on the stock market, political stability and government policy towards business) had a very high influence over retail investors' attitude towards investing in equity stocks.

Shanmughama and Ramyab (2012) tried to explain underlying factors that affect individual investors' behaviour in context of the theory of reasoned action (Fishbein and Ajzen, 1975) and the theory of planned behaviour (Ajzen, 1985; Ajzen, 1991). They collected the data by applying a questionnaire to the respondents living in Coimbatore city of Tamil Nadu State, India. By performing regression analysis, they found that social factors, namely social interactions and media, influenced the trading behaviour (trading frequency) of individual investors.

Tabassum Sultana and Pardhasaradhi (2012) carried out a survey on factors influencing Indian individual equity investors' decision making and behaviour. By

performing FA, out of 40 attributes, they identified 10 factors which represent investors' decisions in common. Cronbach's-alpha test was used to test the reliability of the 40 items, which were categorized under fve headings. According to first preference and weighted mean value of the ranks of multi-investor survey results, 42% of the investors' stock purchases were influenced by accounting information of the company while 37% of them were influenced by personal and financial needs. The rest of the investors who took part in the survey was primarily influenced by information related to recommendation of friends/peer group or broker advice (11%), information related to firm image of the company (4%) and natural or general information of the company (4%) relatively.

Obamuyi (2013) tried to reveal the socio-economic factors influencing investment decisions of investors in the Nigerian capital market through a modified questionnaire developed by Al-Tamimi (2005). By employing independent t-test, analysis of variance and post-hoc tests, past performance of the company's stock, expected stock split/capital increases/ bonus, dividend policy, expected corporate earnings and get-rich quick were found to be the most influential factors on investment decisions of investors in Nigeria. When taking investment decisions, non-economic factors such as religions, rumors, loyalty to the company's products/services, and opinions of members of the family were found to be insignificant among investors.

3. Research Methodology

3.1: Variables

In this study three demographic factors/variables namely age, gender, education and experience of broker's and their risk-taking behavior has been used while making investment. In this study, some items such as Market Efficiency, Prospect Theory, Regret Aversion, Cognitive, Heuristics, Representative Heuristics and Overconfidence (Guven, Mehmet and Abdullah, 2007) of the brokers have checked with respect to age, education and experience of the brokers while making investment decision. For each bias, different questions have been used and have been filled up by brokers in order to know how these biases effect the decision making of the brokers while making investments.

3.2: Data and Sample

The population of the study is 305 brokers registered in Pakistan Stock Exchange in which sample size of 170 brokers filled up the questionnaires. Questionnaire was shared via Google doc with all 305 brokers and time to time reminders were given to them, so they could response soon. In first reminder only 39 brokers filled up the questionnaire and sent back. In second reminder 80 brokers and in third response 51 brokers responded. For each bias different question have been used and have been filled up by brokers in order to know how these biases effect the decision making of the brokers while making investments. For Market efficiency, Prospect theory and regret aversion two questions have been used for each bias while three questions have been used for cognitive bias. One question has been included for each bias such as Heuristics, Representative heuristics and overconfidence so total 12 questions cover these biases while other four questions cover age, education, experience and number of clients

3.3: Method

Survey methodology is being used in this study. Questionnaire is being used for primary data collection where individual was unit of analysis. Each respondent (Broker) will be given a questionnaire to be filled up in which 170 questionnaire forms received back. The questionnaires contain 16 questions related to age, education, experience and risk behavior of the brokers. In questionnaire, different possible options have been given in order to know the respondents attitude. Secondary data gathered from books, journals and websites for review of literature. Descriptive statistics and ONE-WAY ANOVA used for the purpose of analysis.The basic idea of ONE WAY ANOVA is that we have different respondents and their different responses for each question. We make one variable by combining the response of all the respondents with different geographic or educational back ground. In single variable, we cannot differentiate between the reply of different respondents. This job is done by ONE WAY ANOVA and it tells us whether there is any difference in the responses of different geographic and education respondents.

3.5: Hypothesis

H_1: There is a significant relationship between demographiccharacteristics and risk perception.

H_2: Demographic characteristics affect investors' portfolio management.

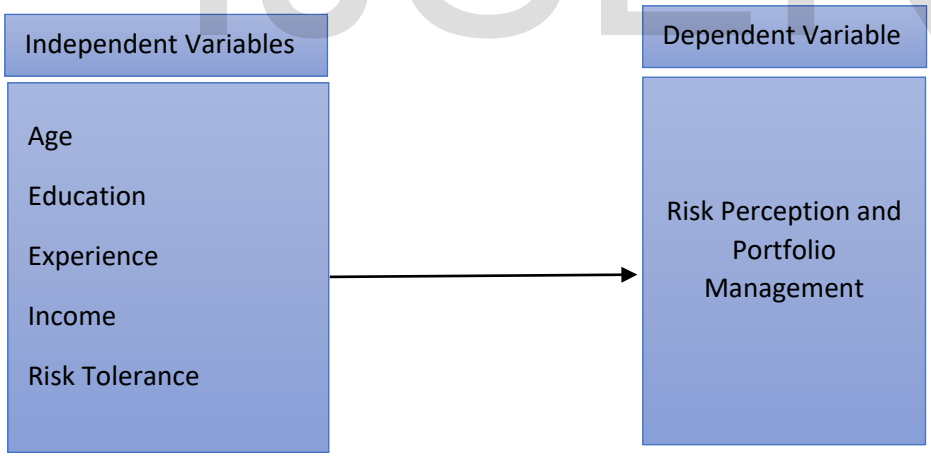
H_3: There is a significant association between risk tolerance and riskperception.

H_4: There is a significant relationship between risk tolerance andinvestors' portfolio choices.

3.7: Theoretical Framework

The present study is based on the theoretical framework illustratedin Figure 1.Our objective is to investigate the impact of demographiccharacteristics (age, gender, education level, and income) and risk tolerance on risk perception and portfolio management. A 16-item questionnaire will be administered to a sample of 170 respondents. The questionnaire (see Appendix) comprised four sections: (i) age, gender, marital status, education level, and occupation; (ii) risk tolerance (six items), (iii) risk perception (nine items), and (iv) portfolio management (six items).

Figure 1: Theoretical framework



4. Results and Analysis

4.1: Descriptive statistics

Empirical findings have been found below, on the basis of questionnaire forms results:

Table 4.1: What is your age?

	Frequency	Percent	Valid Percent	Cumulative Percent
<25	7	4.1	4.1	4.1
25-35	25	14.7	14.7	18.8
35-45	66	38.8	38.8	57.6
45-55	39	22.9	22.9	80.6
>55	33	19.4	19.4	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: The results of table 4.1 are showing the age factor of the brokers in which 38.8 % of the brokers have age of 35-45. It means that brokers having 35 to 45 of age provide more services to investors in purchasing and selling of shares. In the same way, 22.9% brokers are having age of 45-55, 19.4% are having age of more than 55 years, 14.7% are having age of 25-35 while 4.1% brokers are having age less than 25 years.

Table 4.2: What are your educational qualifications?

	Frequency	Percent	Valid Percent	Cumulative Percent
Intermediate	6	3.5	3.5	3.5
Graduation	94	55.3	55.3	58.8
Masters	38	22.4	22.4	81.2
MS/Mphil	18	10.6	10.6	91.8
other	14	8.2	8.2	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: In table 4.2 the results have shown the educational qualifications of the brokers. Most of the brokers are undergraduate as shown above in result and having 55.3% which is high percentage. While 22.4% are having master's degree,10.6% are having MS/Mphil degree and 8.2% are having other academic certifications and diplomas.

Table 4.3: How long have you been offering financial planning advice to clients?

	Frequency	Percent	Valid Percent	Cumulative Percent

<1	7	4.1	4.1	4.1
1-4	69	40.6	40.6	44.7
5-10	77	45.3	45.3	90.0
>10	17	10.0	10.0	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: The results of table 4.3 have shown the time period or duration of the financial services provided by the brokers to the investors. The result showing that five to 10 years' time period got 45.3 % which is the highest percentage among all which is also showing their years of experience in providing such services. It also shows that 40.6% brokers are having experience of 1-4 years, while 10% brokers are having experience of more than 10 years and offering financial services provided by the brokers to the investors.

Table 4.4: How many clients do you currently have?

	Frequency	Percent	Valid Percent	Cumulative Percent
< 10	26	15.3	15.3	15.3
10-39	65	38.2	38.2	53.5
40-79	76	44.7	44.7	98.2
>80	3	1.8	1.8	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: The results of table 4.4 are clearly showing the number of clients. It is showing that the 40-79 has the higher percentage of 44.7% among all other number of clients so 40-79 is the greatest number of client's which brokers have. In the same way,38.7% brokers added that they have 10-39 clients and they offer financial services to them, while only 1.8% brokers have more than 80 clients.

Table 4.5: Do you think that you can make profit by purchasing the shares before the stock market index goes up and sell out the shares before stock market index goes down?

	Frequency	Percent	Valid Percent	Cumulative Percent
I think it is possible to earn profit by doing this	104	61.2	61.2	61.2
I don't think it is possible to earn profit by doing this	41	24.1	24.1	85.3
I have no idea about it	14.7	14.7	14.7	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: The result of table 5 showing the brokers attitude regarding market efficiency. Both of the questions are clearly presenting that the brokers don't believe on market efficiency because most of the brokers have selected the "I think it is possible" option. In case if the brokers really trust on efficient market then their response would be "I don't think it is possible" instead of "I think it is possible". 61% of the brokers suggest that market efficiency does not exist which means that available information has not spread equally on which abnormal profit can be earned.

Table 4.6: If you attempt to evaluate and select individual stock, like you are forecasting whether the market price of HBL or Bank Alfalah shares will go up and at which time it will increase?

	Frequency	Percent	Valid Percent	Cumulative Percent
I think it is possible to earn profit by doing this.	106	62.4	62.4	62.4
I don't think it is possible to earn profit by doing this.	49	28.8	28.8	91.2
I have no idea about it.	15	8.8	8.8	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: The result of table 6 are showing the brokers attitude regarding market efficiency. Both of the questions are clearly presenting that the brokers don't believe on market efficiency because most of the brokers have selected the "I think it is possible" option. In case if the brokers really trust on efficient market then their response would be "I don't

think it is possible" instead of "I think it is possible". 62.4% of the brokers suggest that market efficiency does not exist which means that available information has not spread equally on which abnormal profit can be earned. The above results of table 4.5 and 4.6 are showing that brokers do not use available information which is in market and become overconfident by not processing the already available information so due to overconfidence bias brokers neglect the available information and use their own information.

Table 4.7: Does your intuitions will influence you when you are making decision to purchase shares of a specific company?

	Frequency	Percent	Valid Percent	Cumulative Percent
Intuitions will have little influence	57	33.5	33.5	33.5
Intuitions will have influence	57	33.5	33.5	33.5
Intuitions will have large influence	13	7.6	7.6	54.1
Intuitions will not have influence	37	21.8	21.8	75.9
It based on the circumstances	41	24.1	24.1	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Table 4.7 is presenting the broker's behavior within prospect theory framework. The table 4.7 is showing the results that only 21. 8% of brokers have answered that "Intuition will not have influence" which is clearly showing that the brokers are far away from being rational one due to their decision-making method. Rational decision making is based on analysis while irrational is based on intuition so 33.5 % of the brokers suggest irrational behavior while purchasing shares of a company.

Table 4.8: In uncertain stock exchange market conditions, if you have to sell out some of the shares, which shares will you prefer to sell?

	Frequency	Percent	Valid Percent	Cumulative Percent

The shares which earned a profit	114	67.1	67.1	67.1
The shares which earned a loss	56	32.9	32.9	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Table 4.8 is showing the risk attitude of the brokers. The results of the table 4.8 have showed that 67.1 % of the brokers reported that they give preference to share which earn profits instead of to the share which earn losses. It means that they take risk of having more losses by not selling shares having losses and by realizing those losses. The results are showing support for the risk-taking tendency of the brokers within prospect theory structure. Brokers prefer risk taking behavior by delaying the sale of losing stock and by selling the winning stock in order to realize the gain, so prospect theory is accepted here because risk portion is more as compare to profit.

Table 4.9: By comparing the gratification of 50% appreciation in the price of the shares that you have purchased and the regret of 50% decrease in the price of the shares that you have purchased:

	Frequency	Percent	Valid Percent	Cumulative Percent
The amount of gratification is higher than the amount of regret.	94	55.3	55.3	55.3
The amount of regret is higher than the amount of gratification.	76	44.7	44.7	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Table 4.9 has presented the concept of Regret aversion. The results have described that 94 (55.3%) out of 170 brokers or respondents have answered that the amount of gratification is low which is 76 (44.7%) than the amount of regret which is high 94 (55.3%) as compared to gratification so low gratification which is 76 (44.7%) out of 170 by comparing the 50% appreciation with 50% decrease in price of a share. Here main concern is with the losing stock and risk. Brokers hold losing stock in order to earn significant amount

but when they lost they regret. They gain in winning stock but not feel gratification or happy while the amount of both is same, but they are main concern with the losing stock.

Table 10: Which was the most influencing factor of your decision making to purchase shares which provided greatest? Profit to you recently?

		Advice of a friend	**Advice of professional**	**Analysis of your own**	**Recommendations provided by media**	**Your intuitions**	**Total**
By comparing the gratification of 50 % appreciation in the price of the shares that you have purchased and the regret of 50 % decrease in the price of the shares that you have purchased.	The amount of gratification is higher than the amount of regret	3	10	24	1	4	42
	The amount of regret is higher than the amount of gratification	13	14	17	8	6	58
	Total	16	24	41	9	10	100

Interpretation: Table 4.10 shows the results that out of 58 only 17 respondents or brokers have revealed that they use their own analysis for making decisions while others apply different options for making their decisions. So here the amount of gratification is 24 while the amount of regret is 17. It means that level of gratification is high as compare to level of regret, so the theory is not totally regret aversion.

Table 11: How much return on average you obtained from your investments in stock exchange market during the last year:

	Frequency	Percent	Valid Percent	Cumulative Percent
0	13	7.6	7.6	7.6
≥0-20	80	47.1	47.1	54.7
20-40	64	37.6	37.6	92.4
40-60	13	7.6	7.6	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Results of table 4.11 presenting the Cognitive theory and have described that the 80 respondents have answered that they will have return of ≥0-20 , while replying to the next question they respond that during uncertainty time period they will sell the share which earn profit, so they have kept their belief that their initial decision was faultless or correct. During selection of stocks, investors were more concerned to incorporate losing stock in portfolio so earn less loss. So traditional finance is applicable because of rational decision making.

Table 12: How much average return you are expecting from stock investments for coming year?

	Frequency	Percent	Valid Percent	Cumulative Percent
At loss	29	17.1	17.1	17.1

0 -20%	61	35.9	35.9	52.9
20% -40%	72	42.4	42.4	95.3
40% -60%	8	4.7	4.7	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Results of table 4.12 are also presenting the cognitive theory in which 29 respondents out of 170 have pointed that "I may not be able to have positive return" while the other 141 respondents still believe that they expect a positive return. Brokers are more optimistic because they give more weight to their own decisions instead of other individuals.

Table 13: The shares of well recognized organizations have lesser risk as compared to risk of the shares of the smaller firms:

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree strongly	74	43.5	43.5	43.5
Agree	42	24.7	24.7	68.2
Disagree	28	16.5	16.5	84.7
Disagree strongly	15	8.8	8.8	93.5
Have no judgment	11	6.5	6.5	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: The results of table 4.13 are presenting Heuristic and have showed that 43.5% and 24.7% brokers have expressed that they "agree" or "strongly agree" with the statement that organizations have lesser risk which are well recognize. So, heuristics theory is accepted here.

Table 14: Do you think that familiar stock will provide you more return as compared to stock which is unfamiliar to you?

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, I think it is possible	73	42.9	42.9	42.9
No, I don't think it is possible	66	38.8	38.8	81.8
I have no idea	31	18.2	18.2	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Whereas, the results of table 4.14 have indicated that 42.9% of the brokers have expressed that "they think it is possible" that the known stock will give more return, so heuristics theory is accepted here. Most investors prefer investment in known securities due to lesser risk and more return instead of unknown securities so base on these they forecast that their result will be positive as they know the security well.

Table 15: You have earned profit previously on the purchase of shares which a friend has recommended to you. Now the same friend asks you that the price of shares of a certain company A will increase. What will be your decision regarding the purchase of that stock?

	Frequency	Percent	Valid Percent	Cumulative Percent
I will purchase these shares immediately.	40	23.5	23.5	23.5
I will do some research and then purchase it.	44	25.9	25.9	49.4
I will consider some other similar alternatives.	16	9.4	9.4	58.8

I will not consider purchasing these shares.	35	20.6	20.6	79.4
I will make decision based on existing market trend regarding these shares.	35	20.6	20.6	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Results of table 4. 15 are showing Representative Heuristics which is another kind of Heuristics. According to the results jotted above in table it is clearly stated that 25.9 % of respondents answered that "I will do some research and then purchase it". So, the individual historical experiences could not be disregarded. Brokers have neglected the historical experiences and follow current.

Table 16: If your current stock holding is able to provide you positive return, what will be your decision about your stock holding?

	Frequency	Percent	Valid Percent	Cumulative Percent
I will immediately sell the stock	71	41.8	41.8	41.8
I will hold the stock for better return in the future	55	32.4	32.4	74.1
I am unable to decide	44	25.9	25.9	100.0
Total	**170**	**100.0**	**100.0**	

Interpretation: Table 4.16 results are showing the Overconfidence bias in which brokers trade too aggressively. The results indicated that 71 (41.8%) out of 170 brokers have answered that "I will immediately sell the stock" because of giving positive return instead of holding the stock for future better return. Brokers don't go for holding the stock. They become aggressive and sell the stock.

4.2: One Way ANOVA Results

Table 4.17: Experience

		Sum of Squares	df	Mean Square	F	Sig.
Market Efficiency 1	Between Groups	8.569	3	2.856	5.664	.001
	Within Groups	83.719	166	.504		
	Total	92.288	169			
Market Efficiency 2	Between Groups	9.196	3	3.065	8.065	.000
	Within Groups	63.092	166	.380		
	Total	72.288	169			
Prospect Theory 1	Between Groups	1.704	3	.568	.211	.889
	Within Groups	447.596	166	2.696		
	Total	449.300	169			
Prospect Theory 2	Between Groups	1.934	3	.645	3.004	.032
	Within Groups	35.619	166	.215		
	Total	37.553	169			
Regret Aversion 1	Between Groups	1.175	3	.392	1.592	.193
	Within Groups	40.849	166	.246		
	Total	42.024	169			
Regret Aversion 2	Between Groups	.469	3	.156	.170	.917
	Within Groups	153.084	166	.922		
	Total	153.553	169			
Cognitive theory 1	Between Groups	1.276	3	.425	.761	.518
	Within Groups	92.847	166	.559		
	Total	94.124	169			
Cognitive theory 2	Between Groups	1.434	3	.478	.715	.545
	Within Groups	111.089	166	.669		
	Total	112.524	169			
Heuristic 1	Between Groups	15.274	3	5.091	3.463	.018
	Within Groups	244.026	166	1.470		
	Total	259.300	169			

Heuristic 2	Between Groups	3.479	3	1.160	2.135	.098
	Within Groups	90.145	166	.543		
	Total	93.624	169			
Representative Heuristics	Between Groups	15.744	3	5.248	2.412	.069
	Within Groups	361.132	166	2.175		
	Total	376.876	169			
Overconfidence	Between Groups	2.556	3	.852	1.308	.274
	Within Groups	108.155	166	.652		
	Total	110.712	169			

Interpretation: Table 4.17 provides difference among broker biases in terms of experience. The table provides significant results for all the items related to the broker biases. Results of Market Efficiency 1 and 2,Prospect Theory 2,Heuristic 1 are highly significant values suggesting that brokers having different experiences have different approach and thinking towards behavioral biases. The above results regarding market efficiency are showing that brokers do not use available information which is in market and become overconfident by not processing the already available information so due to overconfidence bias brokers neglect the available information and use their own information. The results of Prospect Theory are showing support for the risk-taking tendency of the brokers within prospect theory structure. Brokers prefer risk taking behavior by delaying the sale of losing stock and by selling the winning stock in order to realize the gain, so prospect theory is accepted here because risk portion is more as compare to profit.

The results of Heuristic and have showed that brokers have expressed that they “agree” or “strongly agree” with the statement that organizations have lesser risk which are well recognize. Hence, heuristics theory is accepted here. Most investors prefer investment in known securities due to lesser risk and more return instead of unknown securities so base on these they forecast that their result will be positive as they know the security well. It can be further concluded on the basis of results in table that individual broker irrational behavior changes with experience.

Table 4.18: Age

		Sum of Squares	df	Mean Square	F	Sig.
Market Efficiency 1	Between Groups	.864	4	.216	.390	.816
	Within Groups	91.424	165	.554		
	Total	92.288	169			
Market Efficiency 2	Between Groups	1.505	4	.376	.877	.479
	Within Groups	70.783	165	.429		
	Total	72.288	169			
Prospect Theory 1	Between Groups	1.977	4	.494	.182	.947
	Within Groups	447.323	165	2.711		
	Total	449.300	169			
Prospect Theory 2	Between Groups	.655	4	.164	.733	.571
	Within Groups	36.897	165	.224		
	Total	37.553	169			
Regret Aversion 1	Between Groups	.878	4	.219	.880	.477
	Within Groups	41.146	165	.249		
	Total	42.024	169			
Regret Aversion 2	Between Groups	9.095	4	2.274	2.597	.038
	Within Groups	144.458	165	.876		
	Total	153.553	169			
Cognitive theory 1	Between Groups	1.494	4	.374	.665	.617
	Within Groups	92.629	165	.561		
	Total	94.124	169			
Cognitive theory 2	Between Groups	.364	4	.091	.134	.970
	Within Groups	112.160	165	.680		
	Total	112.524	169			
Heuristic 1	Between Groups	15.999	4	4.000	2.713	.032

	Within Groups	243.301	165	1.475		
	Total	259.300	169			
Heuristic 2	Between Groups	1.590	4	.397	.713	.584
	Within Groups	92.034	165	.558		
	Total	93.624	169			
Representative Heuristics	Between Groups	2.971	4	.743	.328	.859
	Within Groups	373.905	165	2.266		
	Total	376.876	169			
Overconfidence	Between Groups	2.343	4	.586	.892	.470
	Within Groups	108.369	165	.657		
	Total	110.712	169			

Interpretation: Table 4.18 provides difference among broker biases in terms of age. The table provides significant results for all the items related to the broker biases. Results of Regret Aversion 2 and Heuristic 1 are highly significant. The results have Regret Aversion shows that the amount of gratification is low which is than the amount of regret which is high as compared to gratification. Here main concern is with the losing stock and risk. Brokers hold losing stock in order to earn significant amount but when they lost they regret. They gain in winning stock but not feel gratification or happy while the amount of both is same, but they are main concern with the losing stock.

Whereas, the results of Heuristic 1 have indicated that brokers have expressed that “they think it is possible” that the known stock will give more return, so heuristics theory is accepted here. Most investors prefer investment in known securities due to lesser risk and more return instead of unknown securities so base on these they forecast that their result will be positive as they know the security well.

Table 4.19: Education

		Sum of Squares	df	Mean Square	F	Sig.
Market Efficiency 1	Between Groups	1.695	4	.424	.772	.545
	Within Groups	90.593	165	.549		
	Total	92.288	169			
Market Efficiency 2	Between Groups	1.792	4	.448	1.048	.384
	Within Groups	70.497	165	.427		
	Total	72.288	169			
Prospect Theory 1	Between Groups	15.344	4	3.836	1.459	.217
	Within Groups	433.956	165	2.630		
	Total	449.300	169			
Prospect Theory 2	Between Groups	.815	4	.204	.915	.457
	Within Groups	36.738	165	.223		
	Total	37.553	169			
Regret Aversion 1	Between Groups	.331	4	.083	.327	.860
	Within Groups	41.693	165	.253		
	Total	42.024	169			
Regret Aversion 2	Between Groups	5.429	4	1.357	1.512	.201
	Within Groups	148.124	165	.898		
	Total	153.553	169			
Cognitive theory 1	Between Groups	2.456	4	.614	1.105	.356
	Within Groups	91.668	165	.556		
	Total	94.124	169			
Cognitive theory 2	Between Groups	7.239	4	1.810	2.836	.026
	Within Groups	105.285	165	.638		
	Total	112.524	169			

Heuristic 1	Between Groups	20.143	4	5.036	3.474	.009
	Within Groups	239.157	165	1.449		
	Total	259.300	169			
Heuristic 2	Between Groups	.557	4	.139	.247	.911
	Within Groups	93.066	165	.564		
	Total	93.624	169			
Representative Heuristics	Between Groups	6.578	4	1.644	.733	.571
	Within Groups	370.299	165	2.244		
	Total	376.876	169			
Overconfidence	Between Groups	1.015	4	.254	.382	.822
	Within Groups	109.697	165	.665		
	Total	110.712	169			

Interpretation: Table 4.18 provides difference among broker biases in terms of education. The table provides significant results for all the items related to the broker biases. Results of Cognitive theory 2 and Heuristic 1 are highly significant.It can be further concluded on the basis of results in table 19 that individual broker irrational behavior changes with education.

5. Findings and Recommendations

5.1: Findings

The purpose of the study is to find out the risk-taking behavior of the brokers with respect to the demographic factors namely age, education and experience while making investment decisions. In this study three demographic factors/variables namely Age, Education and Experience of broker's and their risk-taking behavior has been used while making investment. Some items such as Market efficiency, Prospect theory, Regret aversion, Cognitive, Heuristics, Representative heuristics and Overconfidence of the brokers have been checked with respect to age, education and experience while making investment decision.

For each bias different question have been used and have been filled up by brokers in order to know how these biases effect the decision making of the brokers while making investments. For Market efficiency, Prospect theory and regret aversion two questions have been used for each bias while three questions have been used for cognitive bias. One question has been included for each bias i-e Heuristics, Representative heuristics and overconfidence so total 12 questions cover these biases while other four questions cover age, education, experience and number of clients. The population of the study is 305 brokers registered in Pakistan Stock Exchange in which sample size of 170 brokers filled up questionnaires.

The ONE-WAY ANOVA table provides significant results for all the items related to the broker Experience. Results of Market Efficiency 1 and 2,Prospect Theory 2,Heuristic 1 are highly significant values suggesting that brokers having different experiences have different approach and thinking towards behavioral biases. The above results regarding market efficiency are showing that brokers do not use available information which is in market and become overconfident by not processing the already available information so due to overconfidence bias brokers neglect the available information and use their own information. The results of Prospect Theory are showing support for the risk-taking tendency of the brokers within prospect theory structure. Brokers prefer risk taking behavior by delaying the sale of losing stock and by selling the winning stock in order to realize the gain, so prospect theory is accepted here because risk portion is more as compare to profit.

The One-Way ANOVA table provides difference among broker biases in terms of age. The table provides significant results for all the items related to the broker biases. The results have Regret Aversion shows that the amount of gratification is low which is than the amount of regret which is high as compared to gratification. Here main concern is with the losing stock and risk. Brokers hold losing stock in order to earn significant amount but when they lost they regret. The One-Way ANOVA table for education provides significant results for all the items related to the broker biases. Results of Cognitive theory 2 and Heuristic 1 are highly significant.It can be further concluded on the basis of results in table 19 that individual broker irrational behavior changes with education.

5.2: Practical and Policy Related Implications

On the basis of the study an investor can choose that broker which suits him according to his risk-taking behavior. If an investor is risk taker then will surely go for a broker who takes risk i.e. risk taker but if an investor is risk averse, then will avoid such broker who takes risk and will go for the one who avoids risk. The investor will also keep all studied factors and biases in mind which can affect the broker's decision-making process while making investment. SEC arranges training programs time to time as a result brokers are less likely to depend on market rumor and thus make their own judgment by keeping all psychological biases in mind. Due to high tendency Individual broker with age, education and experience goes towards risk taking behavior.

The results suggest the impact of behavioral biases on the decision-making criteria of the investor. The impact of behavioral biases can be reduced by education, incorporating cognitive abilities in decision making, consultation with the experts, social interaction and discussion on future bright prospects. Furthermore, behavior can be modified by analyzing the standard of living risk of the individual broker and modifying his/her behavior accordingly. Decision making of the individual broker can also be modified by rationalizing the expected gains and losses in terms of figures to reflect the amount that investor can either gain or loss.

For better risk management and efficient portfolio management, brokers should be given advance level training in investment decision making. Traditional finance assumes that cognitive abilities of brokers, professionals, large investors, small investor and an ordinary investor are same, meaning that all can analyze the investment options, portfolio development, revision of portfolio in the same way. This is the main flaw of traditional finance. The results of current study as well as behavioral finance suggest that cognitive abilities of all level of investors are different. Thus, for efficient and effective investment and management of portfolio proper investment training and risk management techniques must be learned by brokers and investors. This also suggests that decision making among investors also differs on the basis of cognitive abilities.

Brokers should rationally analyze the investment options rather than relying on the raise in market price of the investment based on the goodwill of company. Before investing broker should calculate the intrinsic value of investment and then should make decision regarding the investment.To reduce the disposition effect broker should ask themselves whether the decision of holding has any solid quantitative grounding or broker is trying to hide its previous mistakes (cognitive dissonance). By doing so broker can revise the decision of holding the losing stock. Brokers are overconfident regarding their own estimation and future movement of prices. Broker should not only relay on its own estimation but have to refer other experts and brokers for accurate predication and estimation.Broker easily fall in the trap of heuristics and take wrong decision by keeping in mind only past experience with investment. In order to overcome the heuristics broker should properly analyze the future prospects of even most familiar investment options.

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