Research Paper   **Management**

Interaction between Demographic Variable and Behaviour Bias of Mutual Fund Investors

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ABSTRACT   *Traditionally, economics and finance have focused on models that assume rationality. However, behavioural bias influences financial decision makers such that they act seemingly in irrational manner, and make suboptimal decision, violate traditional finance claim of rationality. This research study is an attempt to explain how the Heuristics, Bias, and psychological dimensions influence investment decisions of individual investor, how perception influences the mutual funds market as a whole. It is worth exploring whether field of psychology- heuristics and bias helps investor to make more reasonable investment decisions. It is found that there is relationship between perception and overconfidence, mental accounting, familiarity and mental accounting. Thus, it can be concluded that out of six variable (bias) under study there is correlation between four variable with perception viz. Overconfidence, mental accounting, Representativeness in information processing and familiarity bias. It is also observed that age group of investor is most prominent factors among other demographic factors which affect the overconfidence of investors. It can be summed up that there is variation in behavioural biases due to demographic factors viz. Age, Income, Education, while Gender is not showing any evidence of effect. Similarly, awareness is not influencing on behavioural bias but perception if significantly influencing behavioural bias of mutual fund investors.*

KEYWORDS : Behavioural Finance, Heuristics, Bias, Overconfidence, Mental Accounting, Mutual Fund (MF)

Introduction:

Traditionally, economics and finance have focused on models that assume rationality. The behavioural insights have emerged from the application in finance and economics of insights from experimental psychology. Behaviour finance was considered first by the psychologist Daniel Kahneman and economist Vernon Smith, who were awarded the Nobel Prize in Economics in 2002.This was the time when financial economist started to believe that the investor behaves irrationally. Human brains process information using shortcuts and emotional filters even in investment decisions[1].

An underlying assumption of behavioural finance is that, the information structure and characteristics of market participants systematically influence the individual's investment decisions as well as market outcomes. Investor, as a human being, processes information using shortcuts and emotional filters.[2] This process influences financial decision makers such that they act seemingly in irrational manner, and make suboptimal decision, violate traditional finance claim of rationality.

It is an attempt to explain how the Heuristics, Bias, and psychological dimensions influence investment decisions of individual investor, how perception influences the mutual funds market as a whole. It is worth exploring whether field of psychology- heuristics and bias helps investor to make more reasonable investment decisions.

Literature Review:

In the same direction many research work has been added by studies of Gilovich, Griffin, and Kahneman, (2002)[3] referred to heuristics and biases program. Those studies deal with general rule of thumb and deviation from rational expectation, referred to as biases. Shefrin(2000)[4]stated heuristics as to the process by which people find thing out for themselves, usually by trial and error.

Some most important application of this heuristic are in predicting market, picking stocks, choosing mutual funds, selecting money managers, and investing initial public offerings.(IPOs) and seasoned offerings (Shefrin,2000)[5].

W.Forbes (2009)[6] defined behavioural finance as a science regarding how psychology influences financial market. This view emphasizes that the individuals are affected by psychological factors like cognitive biases in their decision making, rather than being rational and wealth maximizing. Behavioural finance is new approach to financial markets that argues that some financial phenomena can be understood by using models where some agents are not fully rational.

The tendency for human beings to be overconfident causes the first bias in investors, and the human desire to avoid regret prompt the second" (Barber and Odean, 1999)[7]. Most of the financial decisions are driven by people's emotions and associated universal human unconscious needs, fears and psychological traits. Thus bias arises and it can be divided into (i) Prospect theory and framing (ii) heuristics and (iii) other biases. Heuristics are referred as rule of thumb, which applies in decision making to reduce the cognitive resources to solve a problem. The heuristic decision process by which the investors find things out for themselves usually by trial and error, leads to the development of rules of thumb (Brabazon, 2000)8.

Given the run up in stock (capital) market in 2004 to the end of 2007 and subsequent downturn of financial market, understanding irrational investor behaviour is as important as it has ever been. In present scenario behavioural finance becomes integral part of decision making process due to its influence on performance of investment stock market as well as mutual funds.

Mental accounting was proposed by Richard Thaler[9]. Traditional finance holds that wealth in general and money in particular must be regarded as 'fungible' and every financial decision should be based on rational calculation of its effects on overall wealth position. In reality, however, people do not have computational skills and will power to evaluate decisions in terms of their impact on overall wealth. Mental Accounting concept is developed by Thaler (1980, 1985) and Tversky and Kahneman(1981).Thaler[10] describe it as, mental accounting is the set of cognitive activities that individuals and households to organise, evaluation and keep track of financial activities and engage in to serve the same function that regular accounting serves in organisation. Mental accounting describes the tendency of people to place particular events into different mental accounts based on superficial attributes (Shiller,1998).[11]

Whether Local bias may be a rational response to better information about familiar assets? Individual investor earned an excess return of 3.5% on local assets relative to non-local assets, taking advantage of local information/knowledge (Ivkovik and Weisbenner,2005)[12] Huberman& Jiang (2006)[13] argued that "Familiarity breeds investment" and that a person is more likely to invest in the company that she thinks that he knows. Instances of this familiarity bias are investing in domestic market, in company stocks.

Gervais and Odean(1998,2001)[14]develop a model in which investor overconfidence results from self-serving attribution bias. Investors in this model infer their own abilities from successes and failures. Due to this tendency to take too much credit for their success, they become

overconfident. Odean,1998 provides explanation to overconfidence and optimisms, by stating that people believe that they are less likely to get hit by bus or be robed than their neighbours. They conclude that new business owners believe their business has 70% chance of success, but only 30% succeed. Gender differences in investor decision making have mainly been studied within the context of overconfidence rather than self-attribution biases. Some theoretical models predict that overconfident investor trade excessively. Barber and Odean (2001).

Research Methodology:
For the Present study, a Descriptive research design has been used, which is typically more formal and structured than exploratory research. It is based on large, representative samples, and the data obtained are subject to quantitative analysis

The present research has been carried out by survey method through administration of structured questionnaire for obtaining information. The primary data investigation proceeded on the framed objectives of the present study. The research instrument consisted of a structured questionnaire. Sampling unit for the study is an individual mutual fund investor. Pre-testing of Questionnaire has been performed before final data collection from 1182 Mutual Fund investors. Attempt is also made to test following hypotheses:

1. There is no association of Awareness about mutual funds with demographic factors.
2. Investment behaviour of MFs investors' is independent of their Perception.
4. Investment behaviour of MFs investors' is independent of heuristics and biases.

Analysis and Findings:
Investment decision making is a complex process which can be defined as a process of choosing a particular alternative among a number of possible courses of actions after careful evaluation of each. Most crucial challenges to investors is to make investment decision, having a difference in their profile, like demographic factors, socio economic factors, educational levels, age, gender, and race.

There are numbers of behavioural finance-biases that affect investor's investment decisions, viz. Heuristics, framing theory, mental accounting and other psychological biases. This study is aiming to answer certain questions to test interaction between demographic factors and behavioural finance biases in investment behaviour. viz. Heuristics, Biases, Optimism, Mental Accounting and Overconfidence.

Following is the result of various analysis performed to understand the interaction between the various demographic factors and behavioural biases in investment of mutual fund investors. In this direction first correlation between awareness, perception of investors and its effect on behavioural biases has been carried out, result is as under.

Table 1 :Correlations between Awareness, Perception and Behavioural Factors

Behaviourl Bias	Statastics	Perception	Awareness	Perception_Sum
Representativeness_Bluechip Fallacy	Pearson Correlation	.421**	0.042	.436**
	P-value	0.000	0.150	0.000
	N	1182	1182	1182
Over_Confidence	Pearson Correlation	.803**	.111**	.821**
	P-value	0.000	0.000	0.000
	N	1182	1182	1182
Investor_Optimism	Pearson Correlation	.386**	.095**	.400**
	P-value	0.000	0.001	0.000
	N	1182	1182	1182
Familiarity_Domestic Bias	Pearson Correlation	.651**	-0.018	.753**
	P-value	0.000	0.529	0.000
	N	1182	1182	1182
Mental_Accounting	Pearson Correlation	.725**	.089**	.732**
	P-value	0.000	0.002	0.000
	N	1182	1182	1182
Representativeness_Information pattern	Pearson Correlation	.770**	0.049	.880**
	P-value	0.000	0.09	0.000
	N	1182	1182	1182
**. Correlation is significant at the 0.01 level (2-tailed).				

Findings and Results
From the above analysis it can be observed that there is variation among the different behavioural bias due to change in level of awareness and perception. There is no evidence of correlation (0.042) between awareness, perception (0.431) and representativeness bias of investors in terms of blue chip fallacy. It indicated that, mutual fund investors are selecting schemes on other parameter not due to they are named as blue- chip schemes. Above result of correlation test does not provide of evidence of optimism bias among the mutual fund investors due to difference in awareness and perception.

It is found that there is relationship between perception and overconfidence, mental accounting, familiarity and mental accounting. A perception and overconfidence correlation (0.821) indicate that they are strongly correlated in investment behaviour. It can be observed that perception and Familiarity (domestic) bias is correlated (0.753). Mental accounting bias has shown correlation with perception of investors at 0.732 level. It is also observed from above analysis that information usage while investing is strongly correlated (0.88) with perception of investors. Thus, it can be concluded that out of six variable (bias) under study there is correlation between four variable with perception viz. Overconfidence, mental accounting, Representativeness in information processing and familiarity bias. However, poor correlation is evident for representativeness bias (blue chip fallacy), optimism bias to perception of mutual fund investors.

Analysis of data about how investors make investment decision, having a difference in their profile, like demographic factors, socio economic factors, educational levels, age, gender, and race is as under. It is observed from table-1 (**Annexure I**) there is association between education of investors and representativeness bias. It is evident that higher Education leads to low level of bias as compared to low level of education. Chi- Square test sig. value 0.042<0.05, implies that null hypothesis is rejected. Thus, it can be concluded that there is significant association between education and representativeness bias in mutual fund investors.

Another test of association as shown in table -2 and table- 2a between gender and overconfidence, gender and optimism bias in table-3 and table- 3a (**Annexure II**) and gender and familiarity bias as given in table-4 and table-4a does not provide evidence of difference in bias due to gender of respondents. It is evident that Chi-Sqare test value 0.197 in overconfidence, 0.471 in case of optimism bias and 0. 482 in familiarity bias are greater than 0.05 level of significance. It implies that null hypothesis cannot be rejected. Thus it can be concluded that Gender of respondent does not lead to change in behavioural biases.

From the table -5 and table-5a (**Annexure III)** it is observed that there is no significant association of gender of respondents and behaviour biases as we fail to reject null hypothesis (observed value 0.122>0.05, 0.132>0.05). Thus it can be concluded that there is no association between gender of respondents and mental accounting, representativeness bias. However, it is evident from the analysis given in table-5 and table-5a that there is strong evidence of association between education of respondents and representativeness, optimism, Familiarity bias and mental accounting as Chi-square value 0.00<0.05 in all cases.

Table-6: Chi square analysis for association between 'over confidence and forecasting' and Demographic Factors

Sr. No.	Demographic Factors	Chi Square Value	p-value	Significance	Hypothesis
1	Gender	0.874	0.646	No	Null hypothesis not rejected
2	Age group	22.975	0.001	Yes	Null hypothesis rejected
3	Education	11.665	0.308	No	Null hypothesis not rejected
4	Income	8.06	0.428	No	Null hypothesis not rejected

From the above table-6 it is observed that age group of investor is most prominent factors among other demographic factors which affect the overconfidence of investors. when it is checked with investors about familiarity and domestic bias following is the result. From the

below given table -7 ,income and age group (chi square value 0.001< 0.05 and 0.045< 0.05)having significant association. However, there is no evidence of association of familiarity bias and other demographic factors.

Table-7: Chi square analysis for association between 'Familiarity bias' and Demographic Factors

Sr. No.	Demographic Factors	Chi Square Value	p-value	Significance	Hypothesis
1	Gender	4.098	0.393	No	Null hypothesis not rejected
2	Age group	33.597	0.001	Yes	Null hypothesis rejected
3	Education	30.583	0.061	No	Null hypothesis not rejected
4	Income	26.662	0.045	Yes	Null hypothesis rejected

Conclusion:

It is found that there is relationship between perception and overconfidence, mental accounting, familiarity and mental accounting. Thus, it can be concluded that out of six variable (bias) under study there is correlation between four variable with perception viz. Overconfidence, mental accounting, Representativeness in information processing and familiarity bias. However, poor correlation is evident for representativeness bias (blue chip fallacy), optimism bias to perception of mutual fund investors. It is also observed that age group of investor is most prominent factors among other demographic factors which affect the overconfidence of investors. However, there is no evidence of association of familiarity bias and other demographic factors. It can be summed up that there is variation in behavioural biases due to demographic factors viz. Age, Income, Education, while Gender is not showing any evidence of effect. Similarly, awareness is not influencing on behavioural bias but perception if significantly influencing behavioural bias of mutual fund investors.

Table-1: Associon of Education and Representativeness

			Representativeness		Total
			high	Low	
Education	Lower	Count	13	222	235
		% within Education	5.50%	94.50%	100.00%
	Higher	Count	92	778	870
		% within Education	10.60%	89.40%	100.00%
	Finance	Count	10	67	77
		% within Education	13.00%	87.00%	100.00%
Total		Count	115	1067	1182
		% within Education	9.70%	90.30%	100.00%

Table-1a: Chi-Square Tests result of Association of Education and Representativeness

	Value	Df	P-value	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.353[a]	2	0.042	0.042		
Likelihood Ratio	7.041	2	0.03	0.031		
Fisher's Exact Test	6.878			0.031		
Linear-by-Linear Association	5.987[b]	1	0.014	0.017	0.009	0.004
N of Valid Cases	1182					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.49.

b. The standardized statistic is -2.447.

Table- 2: Association between Gender of Investors and Overconfidence

			Over_Confidence		Total
			high	Low	
Gender	Male	Count	132	879	1011
		% within Gender	13.10%	86.90%	100.00%
	Female	Count	27	144	171
		% within Gender	15.80%	84.20%	100.00%
Total		Count	159	1023	1182
		% within Gender	13.50%	86.50%	100.00%

Table- 2a: chi Square test - Association between Gender of Investors and Overconfidence

	Value	df	P-value	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.938[a]	1	0.333	0.396	0.197	
Continuity Correction[b]	0.718	1	0.397			
Likelihood Ratio	0.903	1	0.342	0.396	0.197	
Fisher's Exact Test				0.333	0.197	
Linear-by-Linear Association	.938[c]	1	0.333	0.396	0.197	0.058
N of Valid Cases	1182					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.00.

b. Computed only for a 2x2 table

c. The standardized statistic is -.968.

Table- 3: Association between gender of Investor and Optimism bias

			Investor_Optim		Total
			high	Low	
Gender	Male	Count	154	857	1011
		% within Gender	15.20%	84.80%	100.00%
	Female	Count	25	146	171
		% within Gender	14.60%	85.40%	100.00%
Total		Count	179	1003	1182
		% within Gender	15.10%	84.90%	100.00%

Table 3a: Chi-Square Tests-Association between gender of Investor and Optimism bias

	Value	df	P-value	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.043[a]	1	0.836	0.908	0.471	
Continuity Correction[b]	0.008	1	0.927			
Likelihood Ratio	0.043	1	0.836	0.908	0.471	
Fisher's Exact Test				0.908	0.471	
Linear-by-Linear Association	.043[c]	1	0.836	0.908	0.471	0.091
N of Valid Cases	1182					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.90.

b. Computed only for a 2x2 table

c. The standardized statistic is .207.

Table -4: Association between Gender of respondents and Familiarity_Localbias

			Familiarity_Localbias		Total
			High	Low	
Gender	Male	Count	79	932	1011
		% within Gender	7.80%	92.20%	100.00%
	Female	Count	14	157	171
		% within Gender	8.20%	91.80%	100.00%
Total		Count	93	1089	1182
		% within Gender	7.90%	92.10%	100.00%

Table -4a: Chi-Square test of Association between Gender of respondents and Familiarity_Localbias

	Value	df	P-value	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.028[a]	1	0.867	0.878	0.482	
Continuity Correction[b]	0	1	0.989			
Likelihood Ratio	0.028	1	0.868	0.878	0.482	
Fisher's Exact Test				0.878	0.482	
Linear-by-Linear Association	.028[c]	1	0.867	0.878	0.482	0.118
N of Valid Cases	1182					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.45.

b. Computed only for a 2x2 table

c. The standardized statistic is -.168.

Table-5: Association Betwen Demographic Variable and Heuristics and Biases

Biases	Variable		High	Low	Total
Mental Accountin g Bias	Male	Count (% within Gender)	135 (13.40%)	876 (86.60)	1011 (100%)
	Female	Count (% within Gender)	17 (9.90)	154 (90.10%)	171 (100%)
	Total	Count (% within Gender)	152 (12.90%)	1030 (87.10%)	1182 (100%)
Represen tativenes s_Informa tion	Male	Count (% within Gender)	103 (10.20%)	908 (89.80%)	1011 (100%)
	Female	Count (% within Gender)	12 (7%)	159 (93%)	171 (100%)
	Total	Count (% within Gender)	115 (9.7%)	1067 (90.30%)	1182 (100%)
Education* representati veness_Men tal Shortcuts	Lower	Count (% within Education)	14 (6%)	221 (94%)	2.35 (100%)
	Higher	Count (% within Education)	90 (10.30%)	780 (89.70%)	870 (100%)
	Finance	Count (% within Education)	8 (10.40%)	69 (89.60%)	77 (100%)
	Total	Count (% within Education)	112 (9.50%)	1070 (90.50%)	1182 (100%)
Education*Ov erconfidence	Lower	Count (% within Education)	23 (9.80)	212 (90.20%)	235 (100%)
	Higher	Count (% within Education)	125 (14.40%)	745 (85.60%)	870 (100%)
	Finance	Count (% within Education)	11 (14.30%)	66 (85.70%)	77 (100%)
	Total	Count (% within Education)	159 (13.50%)	1023 (86.50%)	1182 (100%)
Education * In vestor_Optimi sm	Lower	Count (% within Education)	23 (9.80%)	212 (90.20%)	235 (100%)
	Higher	Count (% within Education)	141 (16.20)	729 (83.80%)	870 (100%)
	Finance	Count (% within Education)	15 (19.50)	62 (80.50%)	77 (100%)
	Total	Count (% within Education)	179 (15.10%)	1003 (84.90%)	1182 (100%)
Education * Fa miliarity_Dome stic bias	Lower	Count (% within Education)	14 (6%)	221 (94%)	235 (100%)
	Higher	Count (% within Education)	76 (8.70%)	794 (91.30%)	870 (100%)
	Finance	Count (% within Education)	3 (3.90%)	74 (96.10%)	77 (100%)
	Total	Count (% within Education)	93 (7.90%)	1089 (92.10%)	1182 (100%)
Education * Me ntal_Accountin g	Lower	Count (% within Education)	18 (8.70%)	217 (92.30%)	235 (100%)
	Higher	Count (% within Education)	127 (14.60%)	743 (85.40%)	870 (100%)
	Finance	Count (% within Education)	7 (9.10%)	70 (90.90%)	77(100%)
	Total	Count (% within Education)	152 (12.90%)	1030 (87.10%)	1182 (100%)

Table-5a: Chi Square Test of Association Betwen Demographic Variable and Heuristics and Biases

Variables	Chi-Square Test	Value	df	P-value	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Gender* Representativeness	Pearson Chi-Square	1.674[a]	1	0.196	0.212	0.122
Gender* Mental_Accounting	Pearson Chi-Square	1.519[a]	1	0.218	0.266	0.132
Education * Representativeness _Bluechip	Pearson Chi-Square	4.232[a]	2	0.12	0.117	0.000
Education * Investor_Optim	Pearson Chi-Square	7.139[a]	2	0.028	0.028	0.000
Education * Familiarity_Localbias	Pearson Chi-Square	3.763[a]	2	0.152	0.144	0.000
Education * Mental_Accounting	Pearson Chi-Square	8.992[a]	2	0.011	0.011	0.000

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