

INVESTORS BEHAVIOUR: THE IMPACT OF HEURISTIC AND BIASES ON MUTUAL FUND INVESTMENT

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ABSTRACT

Are investor act rationally in mutual fund investment? Investment decisions are influenced to some extent by behavioural biases and heuristic that does not meet the criteria of rationality. The research problem is that what determine the investment behaviour of individual mutual fund investor? Behavioural Finance explains the irrational behaviour that can affect investment decision and overall market. This study is an attempt to provide insight into heuristic and bias contextual factors that influence investors' behavior of mutual funds investment decisions and real market mechanism as a whole. This research analyse the mutual funds investor's behaviour, investment decision with reference to behavioural finance through the survey of investors. Through factor analysis approach, six factors are extracted viz. familiarity and domestic bias, representativeness-blue chip fallacy bias and SAB, optimism bias, mental accounting bias, representativeness bias and overconfidence and aversion to ambiguity bias, that affect the investment behavior. It can be concluded from the analysis that the behaviour of mutual fund investors is irrational in some extent.

Keywords: Behavioural Finance, Heuristics and Bias, Mutual funds, Investors.

INTRODUCTION

Are investor act rationally in mutual fund investment? Investment decisions are influenced to some extent by behavioural biases and heuristic that does not meet the criteria of rationality. The research problem is that what determine the investment behaviour of individual mutual fund investor? Investment decision relies on many considerations and needs beyond risk and return that influence investor's behaviour. This study is an attempt to provide insight into real market mechanism as a whole and fundamental objective in particular through investor behavior analysis. The most critical issue is that the market participant cannot behave rationally always, but deviate from rationality and expected utility assumption while really making investment decisions. Individual investor and their behaviour had received lot of consideration and focus of interest of many scientists not only being confided only to economist, but, due to the inclusion of the findings and the methodology of psychology into financial studies.

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. 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. These raise the issue how investor process the information and implement their investment decision in financial market. To understand the investment decision, behavioral finance framework is used with special context of mutual fund investors. Since the publication of the two seminal work of Kahneman & Tversky (1974) and that of Slovic (1972), there has been a major challenge to the rationality assumption that has served as the foundation for

modern finance theories. Behaviour finance focuses upon how investors interpret and act on information to make informed investment decisions. Investors do not always behave in a rational, predictable and an unbiased manner indicated by the quantitative models as specified by rational finance model.

REVIEW OF LITERATURE

This section provides a brief review of theoretical and empirical understanding of behavioural finance for identification of various factors that influence investor's investment decision making behaviour. Linter has defined behavioural finance as being study of how human interprets and act on information to make informed investment decisions 1998.

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. Behavioural finance is relatively a new field which seeks to provide explanation for people's economic decisions. 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.

Since the publication of the two seminal work of Kahneman & Tversky (1979) there has been a major challenge to the rationality assumption that has served as the foundation for modern finance theories. In 2002 with Awards of the Nobel Prize in economics to professor of psychology, Daniel Kahneman, where he detailed the heuristics and biases that occur when making decisions under uncertainty. Another important phenomenon documented is representative heuristics, mental accounting and overconfidence (Debondt et al., 1985).

Slovic (1972) indicated that "*psychological*" factors play a decisive role, and stated that psychological explanations include cognitive biases such as overconfidence and over optimism, risk taking and loss aversion in the face of possible losses, and influences stock prices due to money illusion due to overconfidence of investors. Coval & Moscovitz (1999) found that the investment managers have strong preference for local firms in terms of proximities and other domestic factors signify the domestic biases in investment decision. In this direction it was stated that employee prefer their own company stock as compared to other company, indicates that familiarly affect the choice of investment (Huberman, 2001).

Individual investor and their behaviour had received lot of consideration and focus of interest of many scientists not only being confided only to economist, but, due to the inclusion of the findings and the methodology of psychology into financial studies. Debondt et al. (1985) published a behavioural based paper on investors' overreaction to news. It is followed by Shefrin & Statman (1985) publication of paper on Disposition effect. They put it as Disposition effect that investors relate to past winners differently than past losers.

The study would therefore help in expanding the existing body of knowledge in the field of Behavioural Finance, and its investment decision implications. Further, the present study will bring to fore the following behavioural biases which will provide impetus for financial decision making; frame dependence, prospect theory, framing, representativeness, familiarity, overconfidence, disposition effect, etc. The objective is to draw from the literature on decision making as well as behavioural finance theory, and propose hypotheses to analyse the investor behavior biases (Banerjee, 1992).

Objectives of the Study

To identify heuristic and bias contextual factors in influencing investors' behavior affecting mutual funds investment decisions (Thaler, 1980).

RESEARCH METHODOLOGY

This study carried out analysis of Mutual funds investor's behaviour, with reference to Behavioural finance. The data was assembled through the survey of sample size consist 585 mutual fund investors in Gujarat State, that is drawn through convenient sampling. Respondents were screened and inclusion was purely on the basis of their knowledge about financial markets, MFs particular. Secondary information was acquired from auxiliary sources; past research records, market and reference books. It is aimed to analyse the interaction between Heuristic biases/factors and investment behavior of mutual fund investors. Research design adopted for this specific study is descriptive in nature. The investigation focuses on presence of biases in investors' behaviour viz. Frame Dependence, Prospect Theory, Framing, Representativeness, Familiarity, Overconfidence, Disposition effect, etc. The objective is to draw from the literature on decision making as well as behavioural finance theory, and propose behavioural hypotheses of irrational behavior among individual investors (Barbaries et al., 1998).

Analysis of behavioural factors and bias of mutual fund investor from behavioural finance theory perspective through factor analysis (Choi & Lou, 2007).

Factor Analysis of Investor behavioral Biases

Factor analysis is a multivariate statistical technique that is used to summarize the information contained in a large number of variables into a smaller number of subsets or factors. Factor analysis is used to identify underlying dimensions or factors, that explain the correlations among a set of variables and to identify a smaller set of salient variables from a larger set without loss of data Joseph.

For the present study factor analysis was performed on the 24 statements. From these 24 statements five statements were omitted from the analysis. Hence factor analysis was done on 19 statements. The responses of the respondents for these statements were measured on a continuum ranging from one to five (1-strongly disagree to 5-strongly agree).

Bartlett's test of sphericity: Table 1 shows Bartlett's and KMO test. Bartlett's test is indicator of nature of relationship among factors. This test invalid hypothesis that relationship structure is a character cross section. From the Table 1, it is observed that Bartlett's test of sphericity is basic (0.001). The null hypothesis stating correlation matrix is identity, is rejected and concluded that the given correlation matrix is not identity matrix.

Table 1 KMO AND BARTLETT'S TEST		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.773
Bartlett's Test of Sphericity	Approx. Chi-Square	2.552x10 ³
	Df	171
	P-value	<0.001

Interpretation

Kaiser-Meyer-Olkin (KMO) gauges the sampling adequacy (which chooses whether the responses given in model are adequate or not) which should be close to 0.5. The KMO measure if sampling adequacy is an index used to examine the appropriateness of factor analysis. It compares the magnitudes of observed correlation coefficients to magnitude of partial correlation coefficients. High value (more than 0.5) indicates factor analysis is appropriate. Kaiser suggest, values between 0.7-0.8 commendable. The KMO statistics as depict in Table 1 was 0.773, is acceptable and justifies the appropriateness of factor analysis (Lintner, 1998).

Communalities

Communality is the amount of variance a variable can explain with all the factors being considered. The method selected for conducting the factor analysis here is Principal Component Analysis (PCA). In this method the total variance in the data is considered. The initial communalities for PCA are 1. However, the primary concern is the extracted communalities, which are achieved after extract of factors. The communalities are shown in Table 2.

Table 2 shows the initial and final communalities for each factor. The final estimate of the communality which is given in the second column of the table is arrived at by an iterative process. To start the ball rolling, an initial estimate is used. By default, this is the squared multiple correlations obtained when each variable is regressed on all the other variables.

Table 2 COMMUNALITIES		
Statements	Initial	Extraction
The mutual funds scheme of well known AMC like Reliance, SBI are less risky than the Small and New Mutual funds schemes	1.000	0.630
Suppose after a bubble there is correction in market, we should shift our retirement savings into equity mutual fund market	1.000	0.672
For retirement planning Debt/bond funds is best option	1.000	0.456
I am able to judge the market 90% of the time rightly for my investment decision.	1.000	0.570
My past investment successes were due to my specific skills	1.000	0.317
My knowledge about Mutual fund investment is better than average knowledge of others	1.000	0.300
Future of Indian Mutual funds Industry is very bright	1.000	0.501
I plan to increase my investment in the mutual fund market in next 12 months	1.000	0.474
The index of stock market will improve and it leads to appreciation in mutual fund value in next 12 months	1.000	0.356
I prefer to invest in a mutual fund schemes I am familiar with, as compared to unfamiliar ones	1.000	0.554
LIC mutual fund and Reliance MF is Good Among others MFs	1.000	0.564
Franklin Templeton and PNB Paribas is risky MF among others	1.000	0.707
Domestic/ Indian MF is better performer than the foreign MF	1.000	0.454
Best option to invest bonus money is aggressive equity mutual funds and blue chip funds	1.000	0.435
We should not take risk in investment of money, which is for children's education	1.000	0.716
If we are investing our saving of last ten years we have to be very careful in selection of asset class	1.000	0.539
Growth Mutual fund scheme is better option than Value mutual funds scheme for investments	1.000	0.179

Those mutual funds which were looser in last three years , we should not invest in.	1.000	0.485
As the SBI Bank & Reliance group is doing good, they will definitely perform better in MFs	1.000	0.649

Note: Extraction Method: Principal Component Analysis.

The below Table 3 shows the Eigen values and amount of variance explained by each successive factor. The Initial Eigen values are for a principal components analysis, in which the communalities are one. The final communalities are estimated by iteration for the principal axis factor analysis, as mentioned earlier. As can be seen from the Table 2, they seen in the Table 3 in the section headed Extraction Sums of Squared Loadings. The rest of the factor analysis is based on five factors, because five factors have Eigen values greater than one. There are other methods which can be used to decide on the number of factors, some of which may generally be more satisfactory than the rule used here Fabrigier. As an aside, it has been suggested that over-extraction (retaining more than the true number of factors) leads to less distorted results than under-extraction (retaining too few factors).

Variance Explained: It is required that the scale constructed and the components extracted should be able to explain maximum variance in the data. An Eigen values represents the total variance explained by each factor. Table 3 shows the Eigen values of all the components that can be extracted. A maximum of 19 components can be extracted as there were 19 statements. The table also shows the cumulative variance. However, it is required that the maximum amount of variance should be explained in minimum number of components – for this reason extraction of the components is required. Only those factors were extracted for which the Eigen values were greater than one. These factors were six in number and together contribute 51.76% of total variance. Thus extracting six dimensions from a total of 19 items was good by all means and shows the validation of the factor analysis (Hirschey & Nofsinger, 2008).

Further Table 3 shows the extraction sum of square loadings for the scale for measuring the service quality construct. However, it can be infer from Table 3 that total variance explained (51.76%) was not uniformly distributed across all components. Only first component accounted for 17.493% of variance. In order to distribute variance uniformly across all the components, a rotation of the components matrix is required. Component matrix is the loadings of various variables to the extracted components (Finucane et al., 2000).

Table 3 TOTAL VARIANCE EXPLAINED									
Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.618	17.493	17.493	4.618	17.493	17.493	2.881	10.911	10.911
2	2.394	9.068	26.561	2.394	9.068	26.561	2.277	8.625	19.537
3	2.046	7.75	34.311	2.046	7.75	34.311	2.803	10.615	30.152
4	1.631	6.177	40.488	1.631	6.177	40.488	2.229	8.442	38.594
5	1.555	5.888	46.376	1.555	5.888	46.376	1.943	7.361	45.955
6	1.42	5.379	51.755	1.42	5.379	51.755	1.531	5.801	51.755
7	1.292	4.893	56.649						
8	1.187	4.495	61.143						
9	1.134	4.294	65.438						
10	1.113	4.216	69.654						
11	1.073	4.064	73.718						

12	1.055	3.996	77.714						
13	1.012	3.833	81.546						
14	0.956	3.62	85.167						
15	0.901	3.411	88.578						
16	0.84	3.182	91.76						
17	0.813	3.081	94.841						
18	0.721	2.73	97.571						

(Note: Component no. 1 to 19 are as mentioned in above table)

(Extraction Method: Principal Component Analysis)

The initial (unrotated) matrix indicates the relationship between the factors and individual variables. The results obtained from these factors can be wrongly interpreted, because the factors were correlated with many variables. In such a complex matrix it is difficult to interpret the factors. Therefore, through rotation, the factor matrix was transformed into a simpler one that was easier to interpret. VARIMAX method of rotation was used in present study to analyze data. It was the most commonly used rotation method. The variance explained by each component after the rotation method is shown in table-3. It is visible from this table that the variance was evenly distributed in a range of 10.911% - 5.801%, which was 17.493% - 5.379% before rotation.

Rotated Factor Matrix: An analysis of factor loadings in the rotated factor matrix helps in interpreting and naming the five factors that had been extracted in the earlier section. Interpretation was done by identifying the statements that have very high loadings on the same component. These factors could then be interpreted in terms of the statements that load highly on it. Table 4 shows the rotated component matrix.

Table 4 ROTATED COMPONENT MATRIX							
Statement No.	Statements	Component					
		1	2	3	4	5	6
1	The mutual funds scheme of well known AMC like Reliance, SBI are less risky than the Small and New Mutual funds schemes	0.66					
2	Suppose after a bubble there is correction in market, we should shift our retirement savings into equity mutual fund market		0.764				
3	For retirement planning Debt/bond funds is best option	0.639					
4	I am able to judge the market 90% of the time rightly for my investment decision.	0.551					
5	My past investment successes were due to my specific skills						
6	My knowledge about Mutual fund investment is better than average knowledge of others						
7	Future of Indian Mutual funds Industry is very bright			0.598			
8	I plan to increase my investment in the mutual fund market in next 12 months						
9	The index of stock market will improve and it leads to appreciation in mutual fund value in next 12 months						
10	I prefer to invest in a mutual fund schemes I am familiar with, as compared to unfamiliar ones						-0.679
11	LIC mutual fund and Reliance MF is Good Among others MFs	0.585					

14	Franklin Templeton and PNB Paribas is risky MF among others	0.61					
12	Domestic/ Indian MF is better performer than the foreign MF	0.56					
13	Best option to invest bonus money is aggressive equity mutual funds and blue chip funds	0.528					
15	We should not take risk in investment of money, which is for children's education					-0.757	
16	If we are investing our saving of last ten years we have to be very careful in selection of asset class			0.5			
17	Growth Mutual fund scheme is better option than Value mutual funds scheme for investments						
18	Those mutual funds which were looser in last three years , we should not invest in.				0.649		
19	As the SBI Bank & Reliance group is doing good, they will definitely perform better in MFs				0.83		

(Note: Rotation Method: Varimax with Kaiser Normalization. Values less than 0.1 is not mentioned in above Table 4)

The factors, depending upon the associated statements and inferences is discussed and inferred as under. From analysis it is observed that statement 1,4,11, and 14 are loaded combined in one factor and labeled as “*Familiarity and representativeness bias*”. And statement 2,1 and 7 are combined and labeled as “*Overconfidence bias*”, statement 7&16 are labeled as “*Anchoring bias/Framing effect*”, statement 18 & 19 are labeled as “*Good company good Stock*”, statement 15 is labeled as “*Mental accounting bias*” and statement 15 and 10 combined and labeled as “*Familiarity Bias*” as per the loading extraction Table 5.

Table 5 Factors Identified and Factor labeling	
Factors	Label
1	Familiarity and representativeness bias
2	Overconfidence(SAB)
3	Anchoring bias/Framing effect
4	Good company good Stock
5	Mental accounting
6	Familiarity Bias (aversion to ambiguity bias)

CONCLUSION

This research attempt to examine the heuristic and biases dimension of investment by individual investors. Objective of this research was to identify and analyse behavioural bias and heuristics and its effect on investment behaviour (factor analysis) of mutual fund investors. The analysis of 19 statements representing heuristics and behavioural biases of investors have been analysed through factor analysis after testing its appropriateness. Through varimax method of factor rotation, six factors so extracted viz. familiarity and domestic bias, representativeness-blue chip fallacy bias and SAB, optimism bias, mental accounting bias, representativeness bias and overconfidence and aversion to ambiguity bias, that affect the investment behavior. It can be concluded from the result of the analysis that the behaviour of mutual fund investors is irrational in some extent.

Behavioural biases understanding related to mutual fund investor have number of practical implications. Professional investors like (MF), could use knowledge of this heuristic, and biases

of individual investors in designing and managing mutual fund schemes. However, investor behaviour is likely to change as market conditions, environmental influence change. It would be interesting to analyze the investors over a period of time and examine the shift in behaviour of investors to understand overall market sentiments.

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