Cognitive and Psychological Biases in Irrational Investor Behavior

AJAY KUMAR S[1]
BCom (International Finance), Department of Professional Studies, Christ University, Bengaluru

Lidiya Elizabeth Das[2]
Department of Professional Studies, Christ University, Bengaluru

Abstract:

The main purpose of this paper is to determine if investors are indeed biased or if behavioural finance models only work on paper. A questionnaire was administered to gauge the effects of cognitive and psychological biases. The paper analyses if different genders experience biases to a different extent than the other. The paper also examines if age plays a role in the way people are affected by biases.

Key words: Behavioural finance, cognitive biases, psychological biases, biases

I. Introduction

Behavioral Finance studies the effects of psychological, cognitive and emotional factors on economic decisions of an individual. (Lin, 2011) It seeks to explain why we often behave irrationally. This paper focuses on Herding, Loss Aversion, Mental Accounting, Overconfidence, Anchoring and the Gambler's fallacy. Herding is the tendency of a human to follow the behavior of a larger group. It is an evolutionary trait where it was beneficial to the prehistoric man to follow the 'crowd' in order to have a better chance of survival. Loss aversion is defined as people's ability to prefer avoiding losses than to acquire equivalent gains. This concept is further explained by prospect theory. Overconfidence involves exaggerating one's ability to perform a task successfully. Anchoring refers to the tendency of mentally attaching to a reference point that might be illogical. This concept is also explained by prospect theory. Gambler's fallacy refers to the tendency to incorrectly assume a less likely event should occur when another event has consecutively occurred. Information cascading refers to how information is disseminated from one source to another.

II. Review of Literature

1. Eugene Fama. (1969) Efficient Capital Markets A Review of Theory and Empirical Work

The efficient market hypothesis states that asset prices fully reflect all available information. It implies that it is not possible to beat the market consistently on a risk-adjusted basis. The theory has three variants, which are concerned with the extent to which asset prices incorporate available information.

1. Weak form- Only historic prices are incorporated
2. Semi strong form- Historic prices and public information is incorporated.
3. Strong form- Historic prices, public information and private incorporation are incorporated. (Fama, 1969)

2. Daniel Kahneman and Amos Tversky (1979) Prospect Theory: An Analysis of Decision under Risk.

This paper critiques utility theory as a model of decision making under risk and proposes an alternate model called prospect theory. This paper researches now individuals make irrational decisions when in uncertainty. Value function represents how people value things. Weighting function represents how people deal with probabilities. The trend for gains follows the rule of diminishing marginal utility but there is an abnormality when it comes to the losses quadrant. The origin is the reference point, which is psychological, due to which it is subject to manipulation. By default the reference point indicates today's wealth but it can change if people are manipulated in ways prospects are framed. The research found that when prospects were worded/framed differently which suggested a different reference point, behaviours changed. The value function has a kink at the origin, which is due to the reference point being subject to manipulation. The kink also indicates people are very conscious of little changes in wealth. Fig 1 is a representation of the value function.

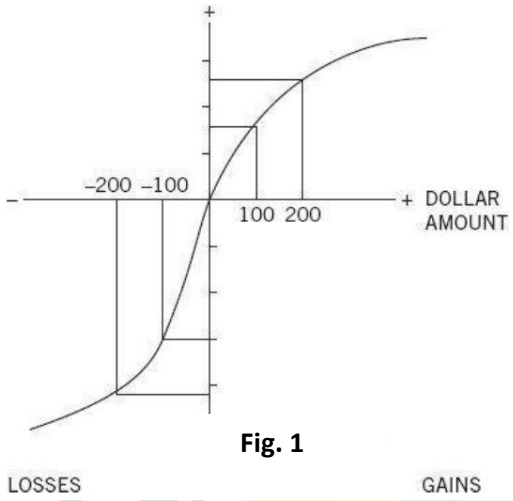


Fig. 1

Weighting function.

Weighting function describes the errors people make when dealing with probabilities. In short, the theory states people often round off lower probabilities to 0 and higher probabilities to 1. However, if they do not round it off they exaggerate between 0 and 1. So therefore, in people's minds probability is thought of in three dimensions- will not happen, may happen and definitely will happen. This is represented in Fig. 2. (Kahneman & Tversky, 1979)

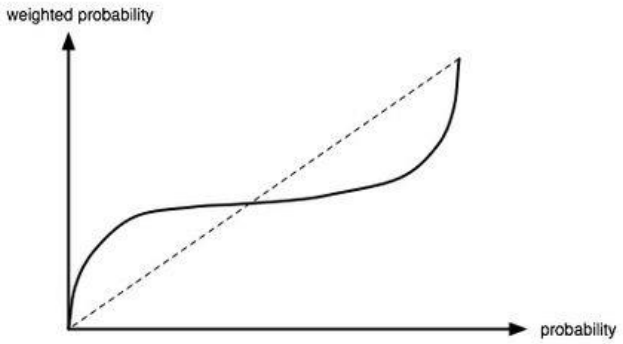


Fig. 2

3. **Malena Johnsson, Henrik Lindblom, Peter Platan. (2002) Behavioural Finance-and the change of investor behaviour during and after the speculative bubble at the end of the 1990's.**

This paper seeks to research in what factors, investing characteristics and decision making processes affected private and institutional investors during the dot com speculative bubble in the 90's and also what factors affected the enormous rise in the value of equity markets during the end of the 90's. This paper also studies how these factors and behaviours changed because of the bubble. After the bubble, private and institutional investors reduced their share of investments, which offer high risk and high returns. No relationship between information sources and the sort of companies they invested in was found. More emphasis was put on fundamental analysis after the bubble. In terms of factors, herding was considered a major contributing factor followed by overconfidence. (Johnsson, Lindblom, & Platan, 2002)

4. **Hersh Shefrin (2005) Behavioural Corporate Finance**

Behavioural obstacles are observed that affect the process of value maximization, internal and external to the firm. The internal factor is termed as behavioural costs. They undermine value creation; they are costs or loss in value, which arise from errors managers make due to cognitive imperfections and emotional influences. External obstacles arise from errors by analysts and investors, these errors have the ability to create a difference between fundamental and market value. Behavioural obstacles internal to the firm are analysed through the cases of Sony and the Chromatron colour tube and Syntex corp.

Overconfidence and loss aversion almost led to the bankruptcy of Sony due to the founder displaying these biases when working on the chromatron project. Syntex corp was a pharmaceutical company, which invested heavily on 'enprostil' test results said that the drug was causing heart attacks, and increased risk of stroke, the president John Fried, ordered the initial memo identifying problems with the drug to be re-written. After long court trials etc. development was stopped. (Shows confirmation bias and loss aversion). The research concluded with the recommendations that if project selection does not affect capital structure & managers seek to max long-term value then the hurdle rate must be used using CAPM approach. Rates should only be adjusted to reflect level of project risk. If project selection affect capital structure then value-maximizing managers will need to adjust hurdle rates to reflect the degree to which the equity of the company is mispriced in the market. (Shefrin, 2005)

5. **Wiliam Coffie (2013) Behavioural Finance theories effects on individual investor's decision-making**

The paper studies the correlations of major stock investment strategies and the most common behavioural finance models effecting investor behaviour. This study mainly addresses anchoring, Herding, Prospect theory and Regret theory. The study focuses on the implications of people being influenced by the above-mentioned biases and theories and if there exists a positive correlation between stock investment strategies and behavioural finance theories. Analysis of primary data showed that investors using the buy and hold strategy had the strongest correlation to regret theory. (75% shoed strong tendencies to this model.) Investors using the fundamental analysis strategy had the strongest correlation to herding theory. (21%) Investors using the technical analysis strategy had no correlation to any of the models, researched in this project. (Coffie, 2013)

III. Research Design.

Statement of the Problem

Many theoretical concepts/ Traditional economic theories [Like the utility theory] assume investors make rational decisions but that always is not the case. In order to identify if investors are biased, data was collected through a questionnaire and analysis was made on the same.

Research Methodology

The research is exploratory. The research seeks to explore the extent to which cognitive and psychological biases affect investors based on various demographics.

Sources of Data

Primary Data [Quantitative]

• Population: Individual investors.

• Sample: 85 investors chosen on random from the population

• Collection tool: Questionnaire [Google Forms]

Secondary Data.

Various research papers and books relating to behavioural finance and other topics relevant to the research.

Data Analysis tools

- Microsoft Excel
- SPSS

Objectives

1. To determine if investors are biased and to measure the extent of the biases.
2. To determine if biases exist between age groups and to identify which age group is most biased.
3. To determine if biases exist between genders and to identify which gender is most affected by biases.

IV. Hypothesis Testing.

1. Null (H0): Investors are not biased.

Alternate (H1): Investors are biased.

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Bias	61.586	84	.000	2.87198879551 8207	2.77925313000 1623	2.96472446103 4791

Table 1

Since the p value is less than 0.05, we reject the null and accept the alternate, which states investors are biased. [One sample t-test used]

2. Null (H0): No significant bias exists between age groups.

Alternate (H1): A significant bias exists between age groups.

Table 2

Pairs	P Value
Age group-Herding	0.000
Age group- Loss aversion	0.000
Age group-Mental accounting	0.000
Age group-Overconfidence	0.000
Age group-Anchoring and Ability	0.000
Age group-Gamblers Fallacy	0.000
Age group- Information Cascading	0.687

Therefore, a significant bias exists between age groups since P value is less than 0.05, except in the case of information cascading which implies no impact between the bias and age group. [Paired sample t-test used]

3. Null (H0): No significant bias exists between genders.

Alternate (H1): A significant bias exists between genders.

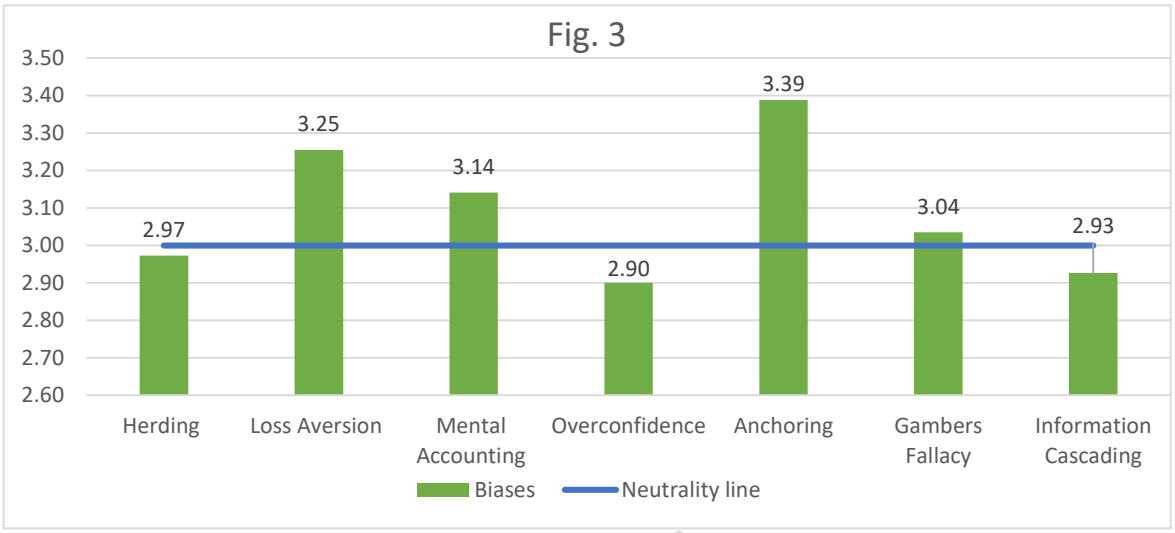
Table 3

Pairs	P Value
Gender-Herding	0.000
Gender - Loss aversion	0.000
Gender -Mental accounting	0.000
Gender –Overconfidence	0.000
Gender -Anchoring and Ability	0.000
Gender -Gamblers Fallacy	0.000
Gender - Information Cascading	0.000

Since the P values are less than 0.05, there exists a significant bias between genders. [Paired sample t-test used]

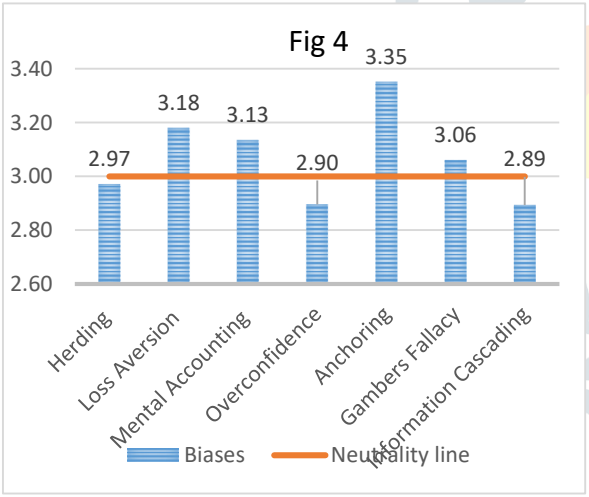
IV. Data Analysis

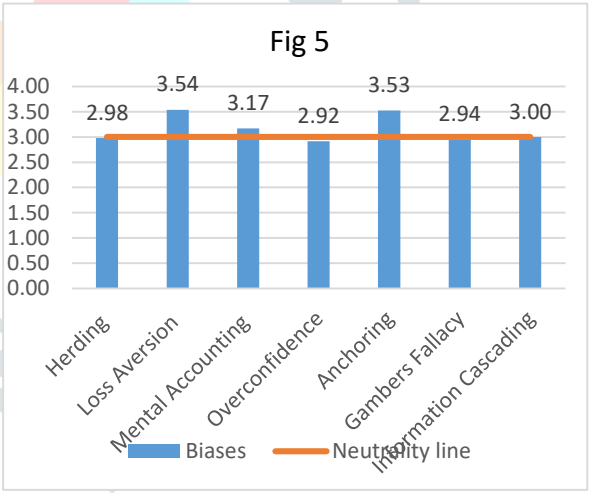
Answers to questions, which helped in assessing biases, were based on a 5-point Likert scale where 5 being Strongly Agree and 1 being Strongly Disagree. In order to ascertain whether investors are biased and which biases affect them more than the other, responses were grouped based on the biases and an average score was computed. Biases with values greater than 3 indicate biases, which are prevalent among investors since, 3 ranks as neutral on the scale.



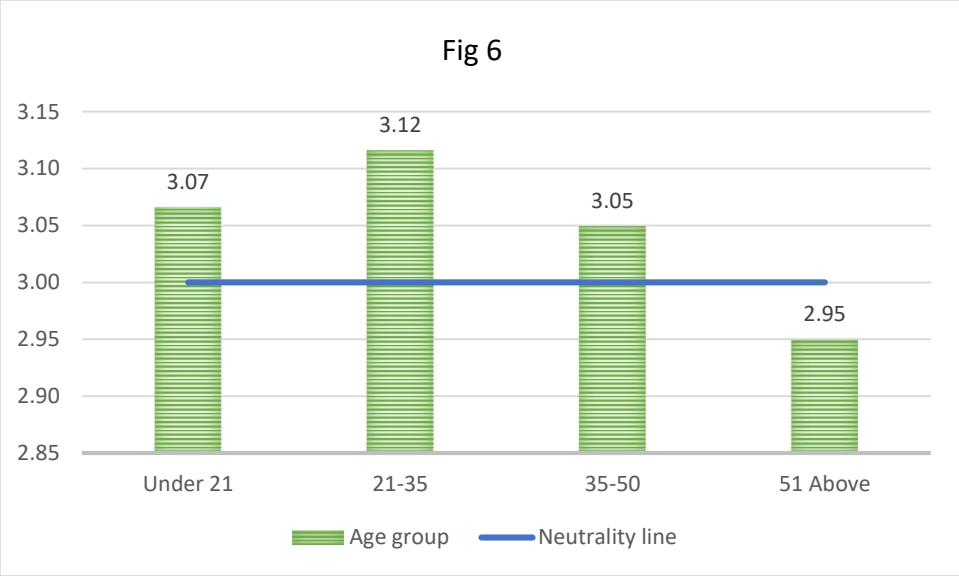
From the above graph we can infer that out of the biases gauged, investors are affected by loss aversion, mental accounting and anchoring.

The above treatment was applied individually on, male and female samples and an average score was computed for each gender. The average score for males is 3.07 while the average score for females is 3.15. This shows females are slightly more biased than men when it comes to decision making in investments.





An analysis of different age groups using the same methods found the age group of 21-35 experience more bias than other age groups while the age group of 51 and above experienced the least bias when it came to investments.



VI. Conclusion

Behavioral finance gives a more realistic understanding of individual's investment decisions as it factors in psychology and human behavior. Through this branch of finance, we can understand where an individual commits errors when it comes to investments and take necessary steps to rectify those errors. Through the concepts of behavioral finance, we see that, the sample as a whole experiences anchoring, loss aversion and mental accounting. In terms of gender, females exhibit a slightly higher tendency of being susceptible to biases than men, while the age group of 21-35 from the sample show a significantly higher tendency of being influenced by biases.

VII. References

1. Coffie, W. (2013). Behavioural Finance Theories Effecting on Individual Investor's Decision-Making. *UNIVERSITY OF WOLVERHAMPTON*, 4-69.
2. Fama, E. F. (1969). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance, Vol. 25, No. 2*, 2-4.
3. Howard, C. T. (2014). Behavioral Portfolio Management. *Journal of Behavioral Finance & Economics*, 4-37.
4. Johnsson, M., Lindblom, H., & Platan, P. (2002). Behavioural Finance-and the change of investor behaviour during and after the speculative bubble at the end of the 1990's. *Schol of Economics and Management Lund University*, 2-70.
5. Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica, Vol. 47, No. 2*, 2-30.
6. Lin, T. C. (2011). A Behavioral Framework for Securities Risk. *Seattle University Law Review*, 1-13.
7. Shefrin, H. (2005). Behavioral Corporate Finance. *Santa Clara University*, 2-17.
8. WARUINGI, K. V. (2011). A SURVEY OF BEHAVIOURAL FACTORS INFLUENCING INDIVIDUAL. *THE SCHOOL OF BUSINESS UNIVERSITY OF NAIROBI*, 50-66.