

Role of Psychological Biases in the Cognitive Decision Making Process of Individual Investors

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Abstract

The efficient markets hypothesis (EMH) has assumed investors as rational, utility-maximizing individuals. Cognitive psychology, on the other hand, suggests that human decisions are susceptible to several illusions: those caused by heuristic decision-making processes, as well as those arising from the adoption of “mental frames.” Behavioural finance believers argue that heuristic-driven bias and framing effects cause market prices to deviate from fundamental values. This paper argues that understanding of the findings of this research benefits individual investors the most as it seeks to create awareness of the various human biases and the high costs they impose on their portfolios. This research examines the investment behaviour of individual investors. The impact of investment behaviour on investment decisions is also studied. We collected data by obtaining direct responses from 128 individual investors from the twin cities of Cuttack and Bhubaneswar having their brokerage accounts maintained with brokers registered with BhSE (Bhubaneswar Stock exchange).

*Different statistical tools e.g. ANOVA, Means, Cross tabulation, AHP and Regression are used to obtain the results of the study. The software packages used are SPSS and Microsoft excel application. Findings suggest that most individual investors of twin cities of **Cuttack and Bhubaneswar** are victims to various psychological biases, of which the most common are Loss aversion, overconfidence, regret aversion and anchoring these cognitive biases significantly influence the investors financial decision making process and in turn affect the market.*

Keywords: *Psychological Biases, Behavioural Finance, Loss Aversion, Overconfidence, Regret Aversion and Anchoring*

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Introduction

The foundation of Modern Finance Paradigm of Standard Finance is based on the most prominent theory of efficient market hypothesis that was initially proposed by Samuelson, (1965). Ritter (2003) put in plain words that, “EMH, the building block of modern finance, is based on the assumption that investors compete for seeking abnormal profits”. This rivalry between investors drives prices to their “correct” value. “Efficient market hypothesis states that financial prices incorporate all available information and prices can be regarded as optimal estimates of true investment value at all times. The efficient market hypothesis is based on the notion that people behave rationally, maximize expected utility accurately and process all available information”, (Shiller, 1998).

Literature Review

Apparently, many investors have the tendency to believe that he or she perceives better than others (**Shiller, 1998**) and also that they think of themselves to be above average and this basically result in **overconfidence** and an excessive trade activity that can affect the stock prices. An influential and worth mentioning research on the trading behaviour of the individual investors has been conducted by Barber and Odean, who obtained the record of the trade activity of some 35,000 investors, who had managed their accounts at a discount brokerage. **Barber and Odean 1999, 2000; Odean 1999**) argued that investors were found to be involved in excessive trading because of their behavioural trait of overconfidence and that ultimately resulted in diminished returns. Asch (1956) talks about the tendency of people to conform to the judgment and behaviour of others while making an investment decision which result in herding behaviour.

Tversky and Kahneman (1971, 1973), DeBondt and Thaler (1985), Lakonishok, Shleifer, and Vishny (1994), Barberis, Shleifer, and Vishny (1998) explain that individuals expect that recent order of generated data can by the representation of the key population parameters from which they have been taken. **Shefrin and Statman (1995)** investigate the relationship between representativeness and variables such as book to market equity, beta, and size, and find that investors rely on representative heuristics in forming expectations because they tend to regard good stocks as the stocks of large companies.

Objectives of the research paper

1. Find out the most common psychological biases a person suffers while making financial investment decisions
2. How these biases affect the investor's financial decisions

Scope of the Research

A sample of 170 individual investors was taken randomly who had experience of equity and debt investment and had at least one account with a registered broker of Bhubaneswar Stock exchange. The sample consisted of only investors from the twin cities of **Cuttack and Bhubaneswar**.

Research Methodology

The primary data has been collected using a structured questionnaire. The data has been collected through survey method. The secondary data has been collected from different newspapers, magazines etc. The population being enlarge the survey was carried among 170 respondents as individual investors of twin cities of Cuttack and Bhubaneswar. We received 128 completed questionnaires whereas 21 were rejected as they were incomplete.

In our research we use both quantitative as well as a qualitative method of analysis. In our study quantitative method refers to the survey we implemented in the form of questionnaires, which are directed at individual investors. We also opted for qualitative approach, in defining the determinants of investment behaviour and factors which may affect their financial decisions, by conducting face to face and telephonic interviews with the individual investors. Moreover stock market outlook and their views about stock market volatility are also taken. Different statistical tools and techniques e.g. ANOVA, Means, Frequencies and Regression Models are used to obtain the results of the study. The software package used were SPSS 17.0 and Microsoft excel spread sheet.

Research Data Analysis :- In this section, we provide the detailed discussion and analysis of the questionnaires administered to the individual investors in this section. It also includes statistical analysis of the questions.

The data collected to study investment behaviour and decision making style of individual investor is analyzed using software packages SPSS and Microsoft Excel.

We used AHP to find the relative importance of different behavioural traits of the investors in contributing overall investment behaviour. We applied AHP on determinants of investment decision. Analytic Hierarchy Process (AHP) is one of Multi Criteria decision making method was originally developed by Prof. Thomas L. Saaty, which helps to derive ratio scales from paired comparisons.

To analyze and represent responses of the investors, we also made use of frequency tables that is basically a representation, either in a graphical or tabular format, of observations within a given interval. We made use of cross tabulations to check the relationship between specific variables. We conducted regression analysis to determine the nature of the relationship between two or more variables; it is concerned with the problem of describing or estimating the value of the dependent variable on the basis of one or more independent variables.

Table 1. Brief Demographic Profile of the Respondent

Gender	Results	Age	Results	Marital Status	Results
Male	86%	< 30yrs	35%	Single	32%
Female	14%	30 – 50yrs	61%	Married	58%
		50 yrs +	4%	Divorced	6%
				Widowed	4%

Source : Tabulation of the survey data after analysis

Table 2. Brief Demographic Profile of the Respondent

Education	Results	Occupation	Results	Income	Results
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Primary	7%	Salaried	49%	Below Rs.5L	65%
Graduation	26%	Self Employed	36%	Rs.5L – Rs.10L	21%
Post Graduation	67%	Retired	7%	Rs.10L – Rs20L	12%
		Student	6%	Rs.20L onwards	2%
		Unemployed	2%		

Source : Tabulation of the survey data after analysis

Findings of the Research

The structured questionnaires helped us identified 4 psychological biases that are most common among the individual investors and have an impact on their investment decisions. These 4 psychological biases are: **Loss aversion, Overconfidence, Regret Aversion and Anchoring**. On the basis of the overall responses of the investors and the ratings that they assign to the factors of the each dimension “Analytical Hierarchical Process” (AHP) determined the relative weights for each dimension of the investment behaviour and priorities them in terms of their level of contribution in the formation of behaviour of the investor.

Results

Our detailed analysis of the data received from 128 completed questionnaires showed that there are many psychological biases which come in the way of rational decision making process of individual investors. They psychological biases found are:

1. Overconfidence

People are overconfident about their abilities. Entrepreneurs are especially likely to be overconfident. Overconfidence manifests itself in a number of ways. One example is too little diversification, because of a tendency to invest too much in what one is familiar with.

2. Mental Accounting

People sometimes separate decisions that should, in principle, be combined. For example, many people have a household budget for food, and a household budget for entertaining. At home, where the food budget is present, they will not eat lobster or shrimp because they are much more expensive than a fish casserole.

But in a restaurant, they will order lobster and shrimp even though the cost is much higher than a simple fish dinner. As they are thinking separately about restaurant meals and food at home, they choose to limit their food at home.

3. Prospect/Loss-Aversion Theory

Loss aversion suggests people express a different degree of emotion towards gains than towards losses. Individuals are more stressed by prospective losses than they are happy from equal gains. An investment advisor won't necessarily get flooded with calls from his client when he's reported, say, a Rs.50,000/- gain in the client's portfolio. But, you can bet that phone will ring when it posts a Rs.50,000/- loss! A loss always appears larger than a gain of equal size - when it goes deep into our pockets, the value of money changes.

4. Framing

Framing is the notion that how a concept is presented to individuals matters. For example, restaurants may advertise "early-bird" specials or "after-theatre" discounts, but they never use peak-period "surcharges." They get more business if people feel they are getting a discount at off-peak times rather than paying a surcharge at peak periods, even if the prices are identical.

5. Representativeness

People don't pay too much attention to long-term averages. People tend to put too much weight on recent experience. This is sometimes known as the "law of small numbers."

6. Regret Theory

Fear-of-regret, or simply regret, theory deals with the emotional reaction people experience after realizing they've made an error in judgment. Faced with the prospect of selling a stock, investors become emotionally affected by the price at which they purchased the stock. So, they avoid selling it as a way to avoid the regret of having made a bad investment, as well as the embarrassment of reporting a loss.

7. Confirmation bias

It can be difficult to encounter something or someone without having a preconceived opinion. This first impression can be hard to shake because people also tend to selectively filter and pay more attention to information that supports their opinions, while ignoring or rationalizing the rest. Consider, for example, an investor that hears about a hot stock from an unverified source and is intrigued by the potential returns. That investor might choose to research the stock in order to "prove" its touted potential is real.

Table 3: Regression Results showing the Relationship between Psychological bias affecting Individual investor's Behavior and his decisions

Variables	Unstandard Coefficients	SE of Coeff.	Beta	t value	P
Intercept	3.412	0.365	-	9.101	0.000
Loss aversion	0.136	0.035	0.017	3.728	0.000
Overconfidence	0.007	0.060	0.142	0.120	0.905
Anchoring	0.053	0.046	0.036	1.142	0.255
Regret Aversion	0.142	0.050	0.342	2.915	0.005

Regression model suggests that out of four broad dimensions of investor behavior two dimensions, investor Loss aversion and Regret Aversion have significant relationship with the market analysis because p values for the dimensions of risk preferences and overconfidence (.000 and .005 respectively) are less than alpha value that supports our argument about the influence of investor behavior on making investment decision by taking market sentiments into consideration. **R square 0.125 Adjusted R square 0.111 F value 8.628 Durbin-Watson 1.577 Degrees of freedom 245 Significant at 5% level.**

Table 4. Investment Objectives of Individual Investors

Investment Objectives	Frequency	Percentage of Sample
Short term profit seeking	57	44.53 %
Long term Profit seeking	40	31.25 %
Steady income (Dividends)	31	24.22%
	128	100 %

Source : Tabulation of the survey data after analysis

It was found that most of the individual investors are investing in stock markets for short term profits which may not be the right decision as equity markets can be volatile in the short term. Recent stock market performance is not very encouraging, therefore it might make many investors upset due to capital decline in the short run.

We got an interesting finding by probing into the investment objectives of investors from different age groups. We found that investors from different age groups have got significant differences in their preferences for investment objectives. One-way Anova results revealed that the investors from age groups of <30 and 30-50 have significant differences (with statistical significances of 0.037 and 0.023 respectively) , from investors belonging to age group of 50+ in terms of their opinion about investments for dividend purposes. By looking into mean differences we came to know that the group of investors with ages more than 50 years are more inclined towards making investment for generating steady stream of income in the form of dividends as compared to investors who belong to age groups of <30 and 30 to 50 years while no significant differences among age groups of <30 and 30-50 regarding investing for dividends are found.

Question No.9 & Q10. deal with Loss aversion which probes into the behavioural dimension of investor where the individual is more averse to a prospective loss than he is happy from an equal amount of prospective gain. A theory which states that people value gains and losses differently and, as such, will base decisions on perceived gains rather than perceived losses.

Thus, if a person were given two equal choices, one expressed in terms of possible gains and the other in possible losses, people would choose the former.

a. Option A: Win Rs.60 for sure

b. Option B: Win Rs. 100 with a probability of 60% and receiving nothing with a probability of 40%

Results for Question 9: We found that most investors prefer Option A against Option B. Although mathematically i.e winning Rs.60 for sure or winning Rs.100 with a probability of 60% comes to the same Rs.60/- but there is a risk in option B (receiving nothing with a probability of 40%). This is a perfectly reasonable attitude that is described as **risk-aversion**.

Results for Question 10: Strangely, 71.87% of the sample (frequency 92 out of 128) we found that the same investors when confronted with a certain loss of Rs.80 versus Option B: Lose Rs. 100 with a probability of 80% and lose nothing with the probability of 20% often chose the risky alternative. This is called **risk-seeking behavior**. This is not necessarily irrational but it is important for us to understand the asymmetry of human choices.

Question No.11 probes into the behavioral aspects of **overconfidence** on the part of an investor. This dimension is divided into three main variables namely:

i. I am confident of my ability to do better than others in picking stocks.

ii. I control and am fully responsible for the results of my investment decisions.

iii. My past investment successes were, above all, due to my knowledge of the market.

Results for Question No.11

In the overall dimension of overconfidence the most prominent factor is the knowledge of the market which resulted in successful investment decisions, as greater weights (approx 44%) are assigned to this factor, while on second rank comes factor of self-control with approximate weights of 34%. On third rank is the stock picking ability with weights of 21.95%.

Table 6: Results of the Question on Overconfidence Factor

Overconfidence Factor	Frequency	Percentage of Sample
i. Ability to Do Better Than Others In Picking Stocks	29	22.65%
ii. My self control is Responsible For The Results of My Investment Decisions	43	33.33%
iii. Investment Successes were all Due To My Knowledge of The Market.	56	43.41%
Total	128	100%

Source : Tabulation of the survey data after analysis

Question No.12 deals with **attribution bias**. We found that many (51 %) attributed their profits from the stock markets due to their own prudence and investment skills and second most was given to recommendations or advice from family/friends.

Table 7: Results of the Question on Attribution Bias Factor

Variable Factor	Frequency	Percentage of Sample
i. Proper recommendations or advice from broker/analyst/banker	13	10.15 %
ii. Proper recommendations or advice from family/friends	35	27.34%
iii. The market has, in general, performed well	27	21.09%
iv. Own Prudence and investment skills	53	41.40%
	128	100%

Source : Tabulation of the survey data after analysis

Limitations

Our research has the limitation that it just looks into the behavioural determinants of individual investors only. There are other classes of investors such as day traders, institutional investors and professional money managers.

In our study we got no access to trade activity data of the individual investor that could have helped in better analysis of investment behaviour. Moreover we need to keep in mind the timing of this research. Our study was a cross-sectional study in a given period of time. However, investor behaviour is likely to change as market conditions, macroeconomic factors and environmental influences change.

Conclusion

Our results show that individual investors do not behave in accordance with the tenets of expected utility theory. They are not always rational. The Loss aversion and heuristics further help in explaining other psychological factors affecting the investment decision-making process and how these processes can lead to market volatility. Loss aversion offers an alternative to the theory of expected utility maximization according to which investors are risk averse at all levels of wealth. On the contrary, the Loss aversion asserts that people are risk lovers for losses and risk averse only for levels of wealth above a certain reference point.

We measured overconfidence in terms of three factors: self control, market knowledge and stock selection ability. We found that majority of investors believe that they have better stock picking ability better than other investors. They are found to be confident of their specific skills that lead them to earn profits over their investments. We found that some investors want to keep their investments in the stock markets only because the stock prices have declined and they do not want to sell their stocks at losses. This is due to the regret aversion tendency of the investors. Very few showed willingness to increase their investments in the stock market in next 12 months because they do not believe that stock prices will increase in the next 12 months. When we measured risk preferences of individual investors we found that investors exhibit risk averse behaviour and they prefer investing in familiar companies with stable returns.

Practical Implications:

Professional investors could use knowledge of the biases and mistakes of individual investors in attempts to “get on the other side of the trade” and make profits at the expense of the individual investors. Alternatively, financial services firms could use knowledge of such biases to inform their product development and marketing departments. Finally, regulators could apply the knowledge to informing regulation and education that can be used to mitigate the biases and improve the welfare of individual investors. Moreover the individual investors themselves can learn from their mistakes and behavioral biases and may avoid repeating them and thus by doing so can reach optimal investment decisions.

References

- Barberis, N., A. Shleifer, and R. Vishny, (1998), "A Model of Investor Sentiment", Journal of Finance 49, 307–345.*
- Benartzi, S. and R. H. Thaler (2001). "Naive Diversification Strategies in Retirement Saving Plans." American Economic Review 91(1): 79-98.*
- Fama, E. (1970). "Efficient capital markets: a Review of theory and Empirical Work", Journal of Finance 25: 383-417.*
- Fama, E. F., (1992). "The Cross Section of Expected Stock Returns," Journal of Finance 47(2) :427-67.*
- Kahneman, D. and A. Tversky, (2000). " Choices, Values, and Frames." Cambridge: Cambridge University Press.*
- Lakonishok, J., Shleifer, A. and Vishny, R. W., (1994). "Contrarian Investment, Extrapolation and Risk." Journal of Finance 49: 1541–78.*
- Samuelson, W. and A. Paul, (1965) "Proof That Properly Anticipated Prices Fluctuate Randomly" Industrial Management Review 6 (spring): 41-49*
- Shefrin, H., M. Stateman, (1994). "Behavioural Capital Asset Pricing Theory," Journal of Financial and Quantitative Analysis 29: 323-349.*
- Shefrin, H., M. Stateman, (1995). "Making Sense of Beta, Size, and Book-to-Market," Journal of Portfolio Management 21(2): 26-34.*
- Thaler, R. H. (1980). "Toward a positive theory of consumer choice." Journal of Economic Behaviour & Organization 1(1): 39-60.*