Understanding Investor Behaviour Using Prospect Theory: An Indian Perspective

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ABSTRACT

Kahneman and Tversky's Prospect Theory tries to explain investor behaviour under risk when alternative outcomes are available to them while making an investment decision. Loss Aversion, Regret Aversion, and Mental Accounting are the three dimensions of this theory. Loss aversion is an investor emotion that prevents unloading unprofitable investments because they lead to a loss. Regret Aversion is the anticipation of regret where an investor holds to loss-making investments with the fear of admitting an incorrect investment decision. Mental Accounting is the value investors place on money, often leading to detrimental results.

This research attempts to gain deeper insights into the complex investor behaviour which forms an important aspect of behavioural finance. An online survey of 282 pan-India stock market investors is done on the three dimensions and the collected data is analysed using One-way ANOVA to measure the relationship between independent (income, investment amount, education qualification, age, gender, and investor experience) and dependent variables (loss aversion, regret aversion, and mental accounting). This study is of significant interest to financial institutions for product design, to the government in making economic policy, and financial advisors who can consider the independent variables as crucial factors that make their clients prone to behavioural biases.

KEYWORDS: behaviourial finance, loss aversion, regret, mental accounting, bias, risk

INTRODUCTION

The Prospect Theory given by Kahneman and Tversky in 1979, is a major contribution in the field of behavioural finance. (Kahneman-1979). The contribution is so influential that Kahneman was awarded the 2002 Nobel Prize for his contribution in Economic Sciences. Despite their work getting several thousands of citations over decades, much of its practical utility outside the laboratory setting only came in the recent years. (Barberis,2013)

A hardcore economic theory, the Prospect theory has several recent applications in the domains of finance, insurance, and endowment effect (areas of riskless choices), consumption-savings decisions, industrial organization, labour supply, amongst others (Barberis,2013).It is an important theory that explains how people perceive the probabilities of earning losses and profits.

The prospect theory includes three biases that an individual is prone to - Loss Bias, Regret Bias, and Mental Accounting Bias. The bias here is considered as an individual's inclination towards a choice that is not logically justifiable. As Benjamin Graham puts it, "The investor's chief problem - and even his worst enemy - is likely to be himself." An individual has to overcome several biases to be successful in the markets failing, which the market punishes by eroding capital and eating away money in the form of charts and penalties(Baker & Ricciardi, 2014).

In his book Behavioural Finance and Wealth Management: How to Build Optimal Portfolios That Account for Investor Biases, author Michael M.

Pompian divided the concept of Behavioural Finance into two subtopics: Behavioural Finance Micro (BFMI) that behaviours or biases of individual investors and Behavioural Finance Macro (BFMA) that deals with anomalies in the EMH (Pompian, 2006).

This paper examines Prospect Variables (Loss Aversion, Regret Aversion and Mental Accounting), which are part of behavioural factors that lead to investment decision making. Research on Sri Lankan investors showed that these variables do not have a significant impact on investment performance (Kengatharan & Kengatharan, 2014)

REVIEW OF LITERATURE

Behavioural finance and Investor Behaviour

Researchers focus on capital markets over the decades has shifted from aggregate market studies to investor-centric and from market-closing data to detailed transactional data.

Studies show that though individuals hold fewer assets (6% as against institutions holding 94%), the frequency (1/3rd of transactions) and aggregate transactional value of individual investors is high. Further, their past actions have a strong relationship with their future actions. Individual investors often follow a contrarian strategy as against the momentum strategy that institutional investors follow(Koesrindartoto, Aaron, Yusgiantoro, Dharma, & Arroisia, 2020).

Behavioural finance paved the way for a new approach to capital markets as the classical finance paradigm suffered from several imperfections(Birău, 2012). Investors largely focus on risk and return and wish to use objective risk assessment for measuring them. However, investing in capital markets involves several psychological factors, and hence behavioural finance emerged as a branch to address the issues and questions related to the mental aspects of investing(Chişu, 2019).

Investors, theoretically speaking, should be rational. However, empirical evidence shows they act irrationally in the financial markets. Emotions make them biased, overconfident and make cognitive errors (Alsabban & Alarfaj, 2020). Investors are irrational, and their decisions are biased. Behavioural finance deals with the psychological aspects of finance and has led to the evolution of several financial theories. The behavioural biases are either driven by heuristics (such as overconfidence and anchoring) or frames (loss aversion and disposition effect). The inability of the field to merely point out loopholes but not to give a technique to beat the stock market makes it to depend on traditional theories (Copur, 2015).

Several researchers examined the history and fundamental theories of behavioural finance. The researcher points out three emerging areas in the field: Deeper investor psychology research linking psychology with economics, exploring market anomalies, building a behavioural finance theory system linking behavioural portfolio theory, and behavioural asset pricing model(Yang, 2016).Investors following prospect theory follow a conservative strategy, and overweighting unlikely favourable events can substantially increase portfolio risk, as can be seen in the study on investment-linked annuities (van Bilsen & Laeven, 2020).

Prospect Theory

Prospects theory explains how people deal with alternatives to probable outcomes that involve risk. These probable outcomes of earning gains or losses are known to the individuals in advance before they make a decision. This theory was put forth after they had experimented on a group of subjects with different choices to make. It examines how an individual takes a decision based on probabilities i.e. the potential value of perceived losses and gains but, not based on the final outcome. This means that the

loss or gain has actually not been incurred by the individual, but, the investor made himself to be put in a situation to experience the feeling of experiencing joy and pain, which influences investment decisions. (Singh, 2019)

Some recent studies empirically tested the Peak-End rule of the Prospect theory to explain stock prices and returns and extended the traditional models such as the Fama-French (1993) three-factor model, Carhart (1997) four-factor model, and more recently the Fama-French (2015) five-factor model to build a new seven-factor CAPM model. The research finds that successive prices are not independent and that the current price is affected by the previous price (Gregoriou, Healy, & Le, 2019).

Loss Aversion

Loss aversion, from a behavioural psychology perspective, says human behaviour is more sensitive for losses over gains i.e., less risk will be taken when losses are possible. Further, loss aversion attitude will be less when making decisions for the future than for the present (Qiqi & Guibing, 2017).

Research studies that studied the impact of loss aversion on investment decisions have given contradicting results. Examining views of 400 respondents and applying PLS-SEM (Partial Least Square-Structural Equation Model), a study found loss aversion has no impact on investment decision making (Nur Ainia & Lutfi, 2019). Age and gender have an impact on the risk-taking ability of the investors as studies found that loss aversion and risk in older individuals make them take less risk (Arora & Kumari, 2015). Some studies considered demographic dimensions, and it is found women have higher levels of loss aversion than men (Charness & Gneezy, 2012) and that they tend to invest less in assets carrying higher degrees of risk (Olsen & Cox, 2001).

Regret Aversion

Regret is a negative emotion that makes an investor feel sad about "what might have been" of an unknown option against the true outcome of a known option. Regret theories are applied to asset pricing models to form new models such as the R-CAPM in which the market as a whole pays investors a positive "regret premium" as compensation to regret premium. (Qin-Regret-based-Pricing-Models) Regret theories were applied to different securities and instruments in the finance domain. Applying the theory on investor decision making (Vohra & Davies, 2020) found that positive corporate associations can mitigate the effects of share performance on investor regret. Currency exposure is a dimension of regret, says (Michenaud & Solnik, 2008).

Mental Accounting

Mental accounting is an investor trait in building a portfolio with several current and future assets put into different categories with wealth generation expectations from each of them. (Nayak & Kumar, 2020) Further, individual differences play a major role in mental accounting. Studies showed that mental accounting is positively correlated with being female, with conscientiousness and financial literacy, and negatively related to education and non-planning impulsivity. (Muehlbacher & Kirchler, 2019) A collective mental accounting (CMA) model built by bringing together all mathematical models are found to outperform other typical mental accounting models in terms of behavioural efficient frontier and utility functions (Momen, Esfahanipour, & Seifi, 2018).

Education and Training

Training is not an option but an essential requirement for those who take up stock market trading and investing as a professional activity. Training helps in professional development in bring a positive first impression, boost morale

and lower turnover (and thereby transactional costs) and follow compliance. (Adamson, 2006) Investors with an academic degree were found to trade more actively, and that trading experience in the form of trading activity contributes to higher returns. (Kristjan, 2016). Some studies dealt with the causal relationship between education, literacy, and behaviour. It is found that sound financial literacy does not necessarily mean good financial behaviour and that there are two necessary areas of improvement. Firstly, alongside educating on financial markets and products, individuals are to be trained on psychological bias and limitations as well. Secondly, complex financial products that are confusing, ambiguous, and inappropriate need to be regulated (West, 2012).

OBJECTIVES OF THE STUDY

1. To understand the behavioural biases (mental accounting, loss aversion, regret aversion) which come under the prospect factors?
2. To examine the relationship between the demographic profile of investors and prospects factors.

RESEARCH METHODOLOGY

An online survey of 282 pan-India stock market investors is done by administering a questionnaire (22-questions) based on the three dimensions to examine their agreement on various prospect variable questions. The convenience sampling method is used for picking the sample. The questions help in understanding investor's tendency to take risks after making a gain (or loss), reaction to hold (or sell) securities when the value goes down (or up), hesitation in reporting loss with family members, affection to specific scripts amongst others. The collected data is empirically analysed using One-way ANOVA to measure the relationship between the independent variable and the dependent variables. Income, investment amount, education qualification, age, gender, and investor

experience are independent variables, and loss aversion, regret aversion, and mental accountings are dependent variables.

HYPOTHESES

1. There is no significant relationship between demographic variables and loss bias.
2. There is no significant relationship between demographic variables and regret aversion.
3. There is no significant relationship between demographic variables and mental accounting bias.

Age and Gender classification

The age and gender profile of the respondents, wherein most of them belong to the age group between 31-40 years (i.e. 32.9 percent) followed by the 41-50 years (25.5 percent) age group and then the age group less than 30 years (25.1 percent). A majority of the respondents were observed to have fallen in the younger and middle age group category. About 93 percent of the total respondents are males.

DATA ANALYSIS AND INTERPRETATION

ANOVA is essentially a procedure for testing the difference among different groups of data for homogeneity. There may be variation between samples and also within sample items. ANOVA consists in splitting the variance for analytical purposes. Under the one-way ANOVA, only one factor is considered and then observes the reasons for the factor to be important in several possible types of samples that can occur within that factor. (C.R.Kothari, 2004)

One-way ANOVA test is used to test the hypothesis, which was proved significant in Linear Regression. Out of the four significant relationships found in regression, only two showed the significance in ANOVA. This further analysis will help to understand which groups show a high level of bias to the respective demographics.

Age and Mental accounting

Table -1 shows the p-value as 0.037, which is less than 0.05, i.e.,$0.037<0.05$; thus, the null hypothesis is not accepted. Mental accounting bias has shown a significant difference (at a 5% level of significance) for investor age in the stock market. This reveals that mental accounting bias influences different age groups, and respondents tend to divide their money into various mental compartments for various needs like a savings account, entertainment account, medical account, debt account, and many more. They attach different weights to each account, and this influences their behaviour consequently affecting their decisions. In any case, if the balance goes negative in those mental accounts, the investor suffers from a feeling of dissatisfaction.

The age group of above 60 years (14 investors) is highly prone to this bias, followed by the age group between 41-50 years (72 investors) and then 31-40 years (93 investors) in line. Therefore, it is concluded that all the age groups are more or less equally prone to this bias, and only the youngest age group i.e. less than 30 years is least prone.

This explains that the respondents were hesitant to sell investments, which once helped them earn significant gains despite the current decline in prices. This is because they have added this investment element into their gain compartment, and eliminating this investment will cause them dissatisfaction. Similarly, on losing money, the respondents were not that keen on buying another movie ticket for Rs.100 as their cash account was debited with Rs.100, and buying another ticket would make it to a negative balance of Rs.200. Contrarily, on losing a movie ticket, they were interested in buying another ticket that was charged to entertainment account in their mind. To explain this, on buying a movie ticket the respondents tend to create an entertainment account in their mind and

credit it with Rs.100, and after the purchase of the ticket, the account is debited by Rs.100, the effect is neutralized, which does not have in the case of losing money.

Average monthly investment and loss bias

In Table-2, the p-value was found to be 0.004, which is less than 0.05, i.e.,$0.004<0.05$; thus, the null hypothesis is not accepted. It shows that there is a high level of a significant relationship between loss aversion and average monthly investments of the respondents. It can be inferred that individuals with fewer investment amounts are risk-averse when they enjoy a gain and tend to avoid risk, but vice versa was observed, i.e. the individuals with lesser investment amounts were inclined to take risks after experiencing a loss in the past when compared to individuals who invest more.

Respondents making smaller monthly investments preferred less risky investments despite knowing that they fetch low returns compared to high-risk investments that have the potential of giving high returns. In two similar instances with the opposite effect i.e. loss of Rs.1000 and gain Rs.1000, it was found that these investors felt more pain for the loss than enjoying the feeling of joy during the gain. These findings show that investors are prone to loss aversion bias. The lower the investment capacity, the more fear of losing money and vice-versa. Investors make every attempt to avoid risk, even at the cost of losing probable gains.

Monthly Income and mental accounting

Table-3 showed that a significant relationship exists between the mental accounting and monthly income of the investor. Upon examination of their responses to the questions asked it was found that the individuals that fall under the income category between Rs.50,000-Rs.1,00,000 hesitate to sell investments,

which once helped them earn significant gains, though currently, its price is falling. In response to two questions asked, it was observed that when respondents lose money, they are less interested to buy a product again, but when they lose a product, they are willing to buy it again. This shows that this category of investors is most prone to mental accounting as they keep different mental accounts for each need, and when any one of those goes negative (not always the net effect), they feel pained.

Experience and Loss

From Table-4 the p-value is found to be 0.024, which is less than 0.05, i.e.,0.024<0.05; thus, the null hypothesis is not accepted. This clearly shows that there is a high level of a significant relationship between loss aversion and experience of the investors in financial markets. It was found that the investors that fall in the experience category between 1-5 years are more loss averse, followed by the less than 1-year group. It was also observed that after enjoying a sure gain, these investors showed a tendency to avoid risk, and after experiencing a sure loss, they were ready to take risks in their investment choices. They preferred investments with low risk-less returns than the ones carrying more risk and high returns. The investors in these groups strongly felt that they experience more pain in losing Rs.1,000 than the joy of gaining Rs.1,000. It can be inferred that with less experience, their nature is loss averse and fearful while the experienced investors tend to become wiser in their investment choices.

Respondents investment in different Markets and training

A majority of the respondents have invested in both the primary and secondary market (53.9 percent), and only 6 percent have invested in derivatives. From the data collected it was found that only 67 respondents out of 282 respondents (i.e. 23.7 percent) have attended formal training to acquaint themselves with the stock markets.

FINDINGS

Average Monthly Income and Experience is significant for Loss Bias, Monthly Income and Age are significant for Mental Accounting. No demographic variable is found to be significant for Regret Aversion. Mental accounting bias influences different age groups. Imbalance in mental accounting leads to dissatisfaction.

SUGGESTIONS

The respondents were found to be prone to mental accounting bias and Loss bias. There is a need to create awareness among investors to help them make logical decisions and not emotional or impulsive ones. Poor training and lack of orientation programs to new investors are missing in the current times. Investors who were trained also felt that there was too much conflicting information available, which made them feel confused. Information overload is a serious issue that needs to be tackled as it leads to dissonance among respondents and creates a feeling of uneasiness.

LIMITATIONS OF THE STUDY

The present study could reach out to 282 investors whose presence was across the nation and hence cannot be generalized to all investors of stock markets. The majority of the respondents were men so the behaviour of women investors could not be captured well. With limited time and resources, the researchers have tried their best to produce the results with minimum error.

SCOPE FOR FURTHER RESEARCH

The sample selected for this study was individual investors. Since there a few studies on prospects theory, including these three factors, the same can be extended to stockbrokers, investment

advisors, and institutional advisors to understand their behavioural profile since their behaviour impacts the decisions of their clients. In addition to this, by increasing the sample size, better insights can be formed.

CONCLUSION

Behavioural finance helps to understand human behaviour which is irrational and how it impacts the investors in the stock market. The present research is an attempt to examine three factors that fall under the Prospect theory. The literature view showed that there is a dearth of studies on these three factors (loss aversion, regret aversion, and mental accounting bias), and demographic factors are taken into consideration in one research. The results show that age, monthly income and mental accounting have a significant relationship, which explains that this bias influences the decisions made by the respondents. Average monthly investment, experience and loss bias also significantly impact their behaviour and make them prone to make irrational decisions. These influential factors unknowingly make them take suboptimal decisions.

A new investor should be made to clear a foundation level course to understand the basics of the markets. The depository participants in various parts of the country can conduct regular training programs for their investors. Thus training and financial literacy should be actively made available to investors to empower them to make rational investment choices.

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Table 1: Result of Mean values and ANOVA-Age & Mental Accounting Bias

	N	Mean
Less than 30	71	11.9859
31-40 years	93	12.7204
41-50 years	72	13.2917
51-60 years	32	12.1563
Above 60 years	14	13.9286
Total	282	12.6773

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	91.895	4	22.974	2.589	.037
Within Groups	2457.739	277	8.873		
Total	2549.635	281			

Source:Primary data Processed using SPSS 20, *Significant at 5% levels

Table 2: Result of Mean values,ANOVA-Average monthly investment and Loss Aversion Bias

	N	Mean
Less than Rs.10,000	91	13.7143
Rs.10,001-Rs.20,000	66	13.0152
Rs.20,001-Rs.30,000	49	12.2857
Rs.30,001-Rs.40,000	14	11.8571
Rs.40,001-Rs.50,000	22	12.9091
Above Rs.50,000	40	11.8500
Total	282	12.8830

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	138.950	5	27.790	3.512	.004
Within Groups	2184.189	276	7.914		
Total	2323.138	281			

Source: Primary data Processed using SPSS 20, *Significant at 5% levels

Table 3: Result of Mean values and ANOVA-Monthly income and Mental Accounting Bias

	N	Mean
Less than 1 year	53	13.1509
1-5 years	123	13.0325
6-10 years	42	13.3571
11-15 years	31	11.3226
Above 15 years	33	12.7576
Total	282	12.8830

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	95.716	4	23.929	2.701	.031
Within Groups	2453.919	277	8.859		
Total	2549.635	281			

Source:Primary data Processed using SPSS 20, *Significant at 5% levels

Table 4: Result of Mean values&ANOVA-Experience&Loss Aversion Bias

	N	Mean
Less than Rs.25,000	32	11.5313
Rs.25,001-Rs,50,000	71	13.1831
Rs.50,000-Rs.1,00,000	84	12.2619
Rs.1,00,000-Rs.1,50,000	47	12.7660
Above Rs.1,50,000	48	13.3333
Total	282	12.6773

Anova

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	91.998	4	23.000	2.855	.024
Within Groups	2231.140	277	8.055		
Total	2323.138	281			

Source:Primary data Processed using SPSS 20, *Significant at 5% levels

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