








# Behavioural Factors Influence on Investment Decisions

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**ABSTRACT.** In making decisions, investors display irrational behaviour. The decision-making process is considered cognitive, as investors must choose based on various available options. According to the findings, various psychological/behavioural factors negatively impacted the investors' decision-making. The current research was conducted to determine the influence of behavioural factors on investors' investment decisions. Five behavioural factors, namely overconfidence bias, representative bias, regret aversion, mental accounting, and herd behaviour, were considered to examine investors' behavioural biases. The cohort for this study comprised Kerala investors, and the analytical hierarchy process (AHP) was utilized to determine the impact of behavioural factors on investment decisions. Based on the priority vector, it was determined that overconfidence bias and regret aversion substantially impacted Kerala's investors. The influence of group behaviour on their decision-making decreased.

**Keywords:** Behavioural finance, overconfidence bias, representative bias, regret aversion, mental accounting, herd behaviour, Investment Decision

## 1. INTRODUCTIONS

Investment decisions are quite a lot influenced by investor psychological factors compared to company analysis fundamentally and technically. Some research results state that investment decisions are strongly influenced by investor psychological factors<sup>1</sup> especially individual investors who are actively trading short-term stocks. The results of investment decisions are heavily influenced by the conditions and situations of these individuals, or in other words, psychological factors have a significant impact on the stock market decisions of individual investors<sup>2</sup>. Traditional financial theories portray investors as rational beings, yet current ideas cannot account for the speculative behaviour shown<sup>3</sup>.

According to behavioural finance, individual investors make irrational financial decisions and are influenced by their prejudices. Behavioural finance is a novel method for studying financial markets that came about as a result of problems traditional theories were having because some financial phenomena can be better understood by using models where agents are not entirely rational<sup>4</sup>. Behavioral finance is the application of psychology to finance<sup>5</sup>.

Since the person is a biopsychosocial being, individuals behave differently and disclose their feelings and perceptions in financial decisions, just as they do in all other life decisions. Humanity's investment decisions are influenced by personal and social-environmental factors; consequently, these decisions vary. Investors' decisions are influenced by their knowledge, historical performance, previous experiences, and expectations<sup>6</sup>. This situation causes investors to develop heuristics (mental shortcuts). As the number of options increases, evaluation and decision-making become increasingly problematic. Despite their significance on experiences, environmental interactions, heuristics, and trends, investors cannot avoid making certain errors when investing<sup>3</sup>.

Shefrin et al.<sup>7</sup> noted that behavioural finance can explain the bias investors experience when making decisions. Due to bias, the market is inefficient, and prices do not reflect available information. According to Baker and Nofsinger<sup>8</sup>, "cognitive errors", "fundamental heuristics", and "psychological biases" influence investment decision-making. Mental biases are referred to as convictions and inclinations<sup>5</sup>; they collectively influence an individual to adopt a particular method of action<sup>9</sup>. Shefrin and Belotti<sup>10</sup> assert that behavioural biases primarily cause irrational decision-making and poor investment performance.

Shefrin and Statman<sup>11</sup> suggested dividing cognitive bias into three categories.

- a. Heuristic bias is the tendency to simplify decision-making processes using norms of thumb. Commonly, heuristics are defined as cognitive shortcuts or rules of thumb that facilitate decision-making, particularly in uncertain situations. This category includes the availability, hindsight, and representativeness biases.
- b. The framing Effect is the bias of reaction to information based on the frameworks of the information. The framing effect is a cognitive bias in which individuals make decisions based on whether options are presented with positive or negative connotations, such as a loss or a gain. Framing bias occurs when individuals base their decisions on how information is conveyed rather than the facts themselves. When the same information is presented in two distinct methods, it can lead to different conclusions or choices. Framing is as essential as a substance that traditional finance previously disregarded. This category includes overreaction, conservatism, anchoring, and confirmation bias.
- c. Prior bias is comprehending information and automatically adjusting to the market price. The prior bias, heuristic bias, and framing effect will eventually cause prices to deviate from their fundamental value, resulting in inefficiency in the market. This category contains optimism, overconfidence, and cognitive accounting biases.

In this study, based on the three categories of cognitive bias, the conceptual framework uses the five cognitive biases, which were also used in the research conducted by Antony and Joseph<sup>12</sup>. The five cognitive biases are overconfidence, representative bias, mental accounting, regret aversion, and herd behaviour.

Overconfidence is typically characterized by overestimating the precision of one's information (i.e., miscalibration), with overconfident investors underestimating the variance of the error in their private signal. Increased overconfidence is generally associated with increased trading volume, increased price volatility, excessive risk-taking, and decreased expected utility, according to the model Duxbury<sup>13</sup>.

Representative bias is known as familiarity bias. When there is a lack of information, neural connections in the brain use shortcuts to process information to accomplish desired goals. Typically, information is processed based on experience. Individuals who purchase a home typically compare the prices of other houses in a comparable location to assess the investment risk and future value of the property<sup>14</sup>.

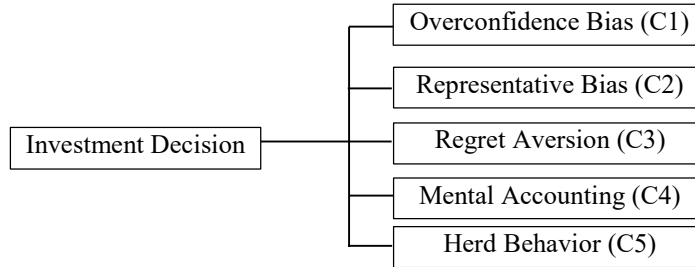
Individuals and households use mental accounting to organize, evaluate, and keep track of their financial transactions<sup>15</sup>. Mental accounting bias, also known as the "two-pocket" theory, is a behavioural bias that occurs when people tend to regard each component of their portfolio separately. Investments are separated into distinct categories based on variables such as the funds' origin and the account's purpose. Mental accounting bias describes how individuals code, categorize, and evaluate economic outcomes<sup>14</sup>.

Regret aversion is when individuals refrain from making a potentially poor investment decision to avoid the negative emotions that could result<sup>16</sup>. To avoid future regret, regret aversion encourages others to acknowledge their mistakes<sup>15</sup>. Regret aversion is a concept within prospect theory<sup>17</sup> that describes a negative emotional bias that prompts investors to avoid regret, thereby causing them to make poor decisions on occasion.

Herding behaviour can manifest itself in various ways, including trading in the same direction as others, following the trend in previous transactions, imitating or correlating one's behaviour to that of others. Typically, inexperienced investors are prone to become risk-seeking without being able to comprehend the hazards they face. Lack of certainty regarding economic conditions and extraordinary market conditions, such as during periods of turmoil, frequently encourage this reckless behavior<sup>18</sup>.

## 2. METHODOLOGY

This study's methodology is the Analytic Hierarchy Process (AHP). Saaty<sup>12,19</sup> explainthat AHP is one of the special methods of Multi-Criteria Decision Making (MCDM) introduced by Saaty in 2001. AHP is very useful in decision-making analysis and has been widely used in many fields, including evaluation, assessment, forecasting, employee selection, and product concept evaluation. Essentially, the AHP method deconstructs a complex and disorderly situation into component elements. It then arranges these elements or variables hierarchically and assigns numerical values to subjective assessments of each variable's relative importance. It then synthesizes these considerations to determine which variables are most important and act to influence the situation's outcome. Figure 1 depicts the research model based on the Network Hierarchical model.



**Figure 1 Research Model**

Beginning with a pair-wise comparison, a matrix is generated. A is a m by m real matrix, with m being the number of evaluation criteria considered. Each entry  $a_{jk}$  of the matrix A represents a weight of 1 for the jth criterion relative to the kth criterion. If  $a_{jk} > 1$ , the jth criterion is more significant than the kth, and if  $a_{jk} = 1$ , the jth criterion is less essential. When two criteria have the same importance, the entry  $a_{jk}$  is 1.<sup>12,19</sup> The pairwise comparison matrix can be formed as follows:

$$A = (a_{ij}) = \begin{vmatrix} a_{11} & a_{12} & a_{1n} \\ \cdot & \cdot & \cdot \\ a_{n1} & a_{n2} & a_{nm} \end{vmatrix} = \begin{vmatrix} 1 & a_{12} & \cdot a \\ \cdot & \cdot & \cdot a_{2n} \\ 1/a_{1n} & 1/a_{a2n} & \cdot 1 \end{vmatrix}$$

Following the construction of the matrix A, the next stage is to normalize the pair-wise comparison Anorm by setting it to 1. The matrix Anorm is computed with the following formula:

$$\alpha_{jk} = \frac{a_{jk}}{\sum_{l=1}^m \alpha_{lk}}$$

In conclusion, the criteria weight vector w (which is an m-dimensional column vector) is constructed by aggregating the entries on each row of Anorm<sup>12,19</sup>

$$w_i = \{Sum\ of\ jkth\ row/m\}$$

Saaty<sup>12,19</sup> demonstrated the relationship between the A evaluation matrix and the weight vector. The method of eigenvalue was used to examine the consistency. The consistency check was performed to confirm the logic of the matrix. The principal normalized eigenvector is also known as the priority vector. As a result of normalization, the sum of all vector elements is 1. The consistency index (CI) was computed using the following formula:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

Lmax is the utmost variance, and n is the number of priorities. Once the CI has been determined, the consistency ratio (CR) is calculated using the CR= CI/RI formula. The Random Index number mentioned by Saaty<sup>12,19</sup> is used to calculate CR. The acceptable upper limit for CR is 0.01. The evaluation procedure must be repeated to ensure consistency if this value is exceeded.

**Table 1 Random Index**

N	1	2	3	4	5	6	7	8	9
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45

## 3. DISCUSSION AND FINDING

Using the methodology mentioned before, Table 2 displays the aggregate ranking of major criteria and the relative importance of major criteria and sub-criteria.

**Table 2**  
**Prioritization and Integrated Ranking of Variables**

Criteria	Priorities	Sub-Criteria	Priorities	Integrated Priorities	Percentage of Integrated Priorities	Rank
<b>Overconfidence bias (C1)</b>	0.242	Confident of my ability to do better than others in stock picking (C11)	0.204	0.0597	5.97%	9
		Specific skills and experience in investment (C12)	0.293	0.0821	8.21%	4
		Complete knowledge about investment avenues (C13)	0.176	0.0484	4.48%	11
		Satisfaction about my investment decision in the past (C14)	0.327	0.1017	10.17%	1
<b>Representative bias (C2)</b>	0.137	Evaluate the past price movements to predict future prices (C21)	0.289	0.0612	6.12%	8
		The current performance of the stock is an indicator of future performance (C22)	0.376	0.0458	4.58%	12
		I borrow money to invest in the market (C23)	0.335	0.0571	5.71%	10
<b>Regret aversion (C3)</b>	0.305	Book profits in a winning stock and then felt I could have waited (C31)	0.416	0.1008	10.08%	2
		Will hold losing stock for too long, expecting trend reversal (C32)	0.377	0.0762	7.62%	6
		Habit of purchasing lottery tickets (C33)	0.207	0.0326	3.26%	16
<b>Mental accounting (C4)</b>	0.184	invest for my retirement as savings (C41)	0.217	0.0378	3.78%	15
		Invest only in a diversified portfolio (C42)	0.309	0.0649	6.49%	7
		Investment based on time horizon (C43)	0.474	0.0851	8.51%	3
<b>Herd behaviour (C5)</b>	0.132	Investment decision based on recommendations (C51)	0.372	0.0355	3.55%	13
		News about the company affects my investment decision (C52)	0.401	0.078	7.8%	5
		I seek the opinion of my friends and colleagues (C53)	0.226	0.0331	3.31%	14

**Source:** Computed data by authors

Table 2 shows that of the five bias criteria in investment decisions, regret aversion (30.5%) and overconfidence bias (24.2%) are the two most influential factors when investors make decisions. When viewed from the order of the sub-criteria, the question that has an influence is on the overconfidence criteria, namely at the point where investors are satisfied with the investments they have made in the past, so that this becomes a valuable experience and is used as a benchmark when deciding to invest in the future (C14). Where Kahneman et al<sup>20</sup> said that usually overconfidence will be followed by regret aversion, from this research it can be seen that when past experience becomes a benchmark in future investment decisions, there will be difficulties in deciding to buy new stocks that investors feel have no experience with. Furthermore, this is not a good thing because holding and waiting for the stocks he chooses will provide benefits (C31).

In the integrated assessment presented in the table, several criteria related to habits and behaviours in investment decision-making have different priorities. The criterion with the highest priority is Investment avenue satisfaction (C13), with a value of 0.327, which accounts for 10.17% of the total integrated priority. This indicates that satisfaction with the

selected investment avenues significantly impacts investment decision-making. This criterion is ranked first in the table. Next, Regret aversion (book profits in a winning stock and then feel I could have waited) (C31) received a priority of 0.377 and ranked second. This shows that the tendency to book profits in a profitable stock and the feeling of "I could have waited longer" plays a vital role in investment decision-making. The integrated priority for this criterion is 7.62%.

Investment based on time horizon (C42) received the highest priority with a value of 0.474, making it the criterion with the highest integrated priority in the table. This shows that this factor, investment based on time horizon, has a significant influence on investment decision-making. Its contribution to the integrated priority percentage is 8.51%, and this criterion is ranked third.

Next, Overconfidence bias (complete knowledge about the investment) (C12), with a priority of 0.176, is ranked fourth. This factor highlights the importance of a complete understanding of investment in making investment decisions. Its contribution to the integrated priority percentage is 4.84%.

Herd behaviour: News about the company affects my investment decision (C51), received a priority of 0.401 and ranked fifth in the table. This shows that the influence of company news on investment decisions also significantly influences investment decision-making. The integrated priority for this criterion is 7.8%.

By looking at the priority order, integrated priority percentage, and ranking, we can understand the factors that significantly influence investment decision-making. Investment avenues, satisfaction, Regret aversion: book profits in a winning stock and then feel I could have waited, investment based on a time horizon, Overconfidence bias: complete knowledge about investment and Herd behaviour and whether news about the company affects my investment decision are criteria that need to be seriously considered in the investment decision-making process.

#### 4. CONCLUSION

Several factors influence investment decision-making. First, satisfaction with the type of investment chosen plays a significant role. Investors who are satisfied with the investment type tend to make better investment decisions. Furthermore, emotion management and regret aversion are also crucial in investment decision-making. Investors who can control their emotions and avoid regret will make more rational and purposeful investment decisions.

Consideration of the investment period also plays an important role. Investors who properly consider their investment time horizon can set an investment strategy that suits their financial goals. In addition, overconfidence bias, which is the tendency of investors to have excessive confidence in choosing stocks, can affect investment decision-making. Investors should be cautious of this tendency and make decisions based on objective analysis.

Finally, the influence of the information environment, such as company news and the opinions of others (herd behaviour), can also affect investment decision-making. Investors must be aware of these influences and conduct careful research before making investment decisions. By understanding these factors and managing them wisely, investors can improve their ability to make better investment decisions that meet their financial goals.

#### 5. REFERENCES

1. Loewenstein, G. *PREFERENCES, BEHAVIOR, AND WELFARE † Emotions in Economic Theory and Economic Behavior*.
2. Bakar, S. & Yi, A. N. C. The Impact of Psychological Factors on Investors' Decision Making in Malaysian Stock Market: A Case of Klang Valley and Pahang. *Procedia Economics and Finance* **35**, 319–328 (2016).
3. Yurttadur, M. & Ozcelik, H. Evaluation of the Financial Investment Preferences of Individual Investors from Behavioral Finance: The Case of Istanbul. in *Procedia Computer Science* vol. 158 761–765 (Elsevier BV, 2019).
4. Barberis, N. & Thaler, R. *A SURVEY OF BEHAVIORAL FINANCE\**. (2003).
5. Pompian, M. M. Behavioral finance and investor types\_ managing behavior to make better investment decisions. *2012*.
6. Cohen, G. & Kudryavtsev, A. Investor rationality and financial decisions. *Journal of Behavioral Finance* **13**, 11–16 (2012).
7. Shefrin, H. & Belotti, M. L. *Behavioral Finance: Biases, Mean-Variance Returns, and Risk Premiums*. (2007).
8. Nofsinger, J. R. *The Psychology of Investing*. (2018).
9. Sahi, S. K., Arora, A. P. & Dhameja, N. An Exploratory Inquiry into the Psychological Biases in Financial Investment Behavior. *Journal of Behavioral Finance* **14**, 94–103 (2013).
10. Shefrin, H. & Belotti, M. L. *Behavioral Finance: Biases, Mean-Variance Returns, and Risk Premiums*. (2007).

11. Shefrin, H. & Statman, M. *Behavioral Portfolio Theory. Conditions JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS* vol. 35 (2000).
12. Antony, A. & Joseph, A. I. Influence of Behavioural Factors Affecting Investment Decision—An AHP Analysis. *Metamorphosis: A Journal of Management Research* **16**, 107–114 (2017).
13. Duxbury, D. Behavioral finance: insights from experiments II: biases, moods and emotions. *Review of Behavioral Finance* vol. 7 151–175 Preprint at <https://doi.org/10.1108/RBF-09-2015-0037> (2015).
14. Jain, J., Walia, N. & Gupta, S. Evaluation of behavioral biases affecting investment decision making of individual equity investors by fuzzy analytic hierarchy process. *Review of Behavioral Finance* **12**, 297–314 (2020).
15. Thaler, R. H. *Mental Accounting Matters. Journal of Behavioral Decision Making J. Behav. Dec. Making* vol. 12 (1999).
16. Frehen, R. G. P., Goetzmann, W. N. & Geert Rouwenhorst, K. New evidence on the first financial bubble. *J financ econ* **108**, 585–607 (2013).
17. Kahneman, D. & Tversky, A. *E C O N O M E T R I C A I C I V O L U M E 4 7 M A R C H , 1 9 7 9 N U M B E R 2 P R O S P E C T T H E O R Y : A N A N A L Y S I S O F D E C I S I O N U N D E R R I S K .* (1997).
18. Kyriazis, N. A. Herding behaviour in digital currency markets: An integrated survey and empirical estimation. *Heliyon* vol. 6 Preprint at <https://doi.org/10.1016/j.heliyon.2020.e04752> (2020).
19. Saaty, T. L. *Decision making with the analytic hierarchy process. Int. J. Services Sciences* vol. 1 (2008).
20. Tversky, A., Slovic, P. & Kahneman, D. *The Causes of Preference Reversal.*

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