

COGNITIVE BIASES AND INVESTMENT DECISIONS: A MEDIATING EFFECT OF RISK PROPENSITY

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ABSTRACT

This research explores the intricate relationship between cognitive biases and investment decisions, with a particular focus on the mediating role of risk propensity. Cognitive biases, including recency bias, confirmation bias, and endowment bias, have been recognized as influential factors in shaping investor behavior. This study aims to empirically investigate how these biases impact investment decisions and how risk propensity mediates these effects. Utilizing a quantitative approach, data was collected from a sample of investors in Pakistan through structured questionnaires. The research reveals that while recency bias significantly affects investment decisions, confirmation bias and endowment bias do not have a substantial impact. Furthermore, the findings indicate that risk propensity plays a critical role in mediating the relationship between cognitive biases and investment decisions. This study contributes to the understanding of cognitive biases in investment contexts and provides insights into how risk propensity can influence the decision-making process. The implications of these findings offer valuable guidance for investors and financial advisors seeking to mitigate the adverse effects of cognitive biases and enhance investment strategies.

Keywords: Cognitive Biases, Investment Decisions, Risk Propensity, Prospect Theory, Theory of Planned Behavior

INTRODUCTION

Behavioral finance addresses two key aspects: the individual investors and the overall market. Behavioral finance is split into two main areas. One looks at the overall market and its unusual patterns, known as macro behavioral finance. The other looks at how individual investors make decisions and how their choices often don't align with logical thinking, which is called micro behavioral finance (Pompian, 2006). Macro behavioral finance looks at how the market sometimes acts unexpectedly,

explaining these patterns with ideas from human behavior. In contrast, micro behavioral finance focuses on the way individual investors make decisions, which often doesn't match up with the purely logical models we usually expect (Jureviciene et al., 2012).

Behavioral finance talks about 'bounded rationality,' which means that people make decisions based on the knowledge they have, but their ability to think through options is limited by

how much they know and can process at the time (Uzar & Akkaya, 2013). Behavioral finance explains that people don't always make logical decisions, as traditional finance says. According to Ritter (2003), it provides information about how biases and emotions inspire market prices. This mental perspective on marketplace moves contradicts the efficient marketplace hypothesis, which posits that any new information applicable to a business enterprise's price is quick included into the stock price (Ben McClure, 2004).

Early contributions by Simon (1955, 1959), Margolis (1958), and Cyert & March (1963) were among the first to comprise mental insights into company finance. Subsequent studies with the aid of researchers like Thaler (1999), who described behavioral finance as an integration of classical economics and psychology, and Shefrin (2001), who studied how psychology affects financial decision-making, have been instrumental in building this area. Swell (2005) similarly described behavioral finance as the examine of psychology's have an impact on financial practitioners and markets, emphasizing that cognitive biases regularly lead people far from merely rational decisions.

Inquiries into behavioral finance regularly investigate how individual behaviours effect market contraptions and fluctuations. Goldberg and Von Nitzsch (1999) described behavioral finance as a financial marketplace principle focused on behavior, noting that human beings behave rationally only within unique obstacles. Forbes (2009) also described behavioral finance as a technology regarding how psychology impacts financial markets. This attitude contrasts with traditional financial theories, which anticipate that investors make rational decisions (Muhammad and Maheran, 2009). Conventional models, inclusive of the Markowitz portfolio ideas (Markowitz, 1952) and the capital asset pricing model (Treynor, 1961), were designed with rational investors in mind, assuming marketplace performance (Zahera and Bansal, 2018; Kumar and Goyal, 2015).

The prospect theory of Tversky & Kahneman (1979) challenged the assumptions of rational economic decision-making by showing, thru experiments, that people behave in another way primarily based on their gains and losses. Investors

regularly avoid risks when profiting however may take risks while dealing with losses. Behavioral finance, thru theories like prospect idea, seeks to introduce mental dimensions into financial selection-making (Ritter, 2003).

Researchers continue to perceive diverse behavioral finance elements that have an impact on investment choices, which include biases, emotional affects, and social elements (Ahmad, 2022; Lather et al., 2020). Research have shown those elements can cause wrong choices, contradicting the belief of rationality in conventional models (Goswami et al., 2020; Kartini & Nahda, 2021; Mahapatra & Mishra, 2020; Sharma et al., 2021; Singh et al., 2016). Verma (2007) mentioned that behavioral finance attempts to apprehend how human beings often neglect fundamentals and make decisions primarily based on emotions, whilst Ritter (2003) mentioned that psychology notably drives inventory marketplace fluctuations.

This study aims to investigate how confirmation bias, endowment bias, and recency bias influence individual investors' investment decisions, focusing on the mediating role of risk propensity. The information acquired can be applied to enhance market functioning and financial stability in Pakistan and comparable economies, which will benefit both individual investors and the economies in issue. The study's objectives are:

- To Investigate the influence of confirmation bias on investment decisions of retail investors in the Pakistan Stock Exchange.

- To Evaluate the impact of endowment bias on investment decisions of retail investors in the Pakistan Stock Exchange.

- To Examine the effect of recency bias on investment decisions of retail investors in the Pakistan Stock Exchange.

- To Observe the mediation of risk propensity between recency bias, endowment bias, confirmation bias and investment decisions.

2 Literature Review

A crucial component of both individual and corporate financial planning is making investment selections. In order to optimize returns and control risk, they entail the process of selecting from a variety of financial assets, including stocks, bonds,

mutual funds, and real estate. Modern portfolio theory, developed by Markowitz in 1952, states that investors base their choices on expected returns and the variance of those returns. It is widely believed that investors behave logically and make their choices on an extensive examination of all the facts at their access. Behavioral finance, on the other hand, questions this notion, arguing that investors frequently make poor investing decisions as a result of psychological influences, emotions, and cognitive biases (Shefrin, 2000). Since cognitive biases can skew perception, impair objectivity, and result in irrational conclusions, their influence on investment decisions has been extensively investigated (Kahneman & Tversky, 1979).

2.1 Confirmation Bias and Investment decisions

A cognitive error known as confirmation bias occurs when investors unconsciously look for and remember information that confirms their preconceived notions while frequently ignoring information that contradicts them (Shefrin, 2007a). This tendency can make it more difficult to make objective decisions since investors tend to base their financial evaluations on evidence that supports their existing opinions rather than taking fresh information into account (Devlin & Billings, 2018).

Researchers have focused on the influence of confirmation bias on investment choices in recent years. According to Pouget (2023), confirmation bias may play a role in the development of financial market bubbles since investors frequently overlook contradicting facts in favour of information that supports their beliefs, which can skew market behavior. According to Trehan & Sinha (2021), stock market investors are especially impacted by this prejudice, as they may join online forums that support their opinions while ignoring those of others.

Cheng (2018) discovered that decision-making is significantly influenced by confirmation bias, particularly in markets where investors are motivated to hold both short-term and long-term positions consistent with their pre-existing opinions. According to additional research by Trehan & Sinha (2021) and Akhtar & Das (2019), confirmation bias causes investors to look for

evidence that supports their decisions, which can result in overconfidence and less-than-ideal outcomes (Barber & Odean, 2001; Jonas et al., 2001). Kurniawan & Murhadi (2018), however, discovered conflicting findings, demonstrating that confirmation bias varied in its impacts across contexts and did not substantially affect investing decisions for some investors.

H1: Confirmation Bias has significant influence on investment decisions.

A key factor in determining how much confirmation bias affects investing behavior is risk propensity. Confirmation bias is frequently more likely to occur in investors with limited risk tolerance who ignore diversification and cling to known assets. Because they want to reduce ambiguity and risk exposure, they are hesitant to seek for alternative information. However, those who are more inclined to take risks can actively look for evidence to support their high-risk investment strategies, which could increase their confidence and encourage them to take on more risk (Barberis & Thaler, 2003). The interplay between risk propensity and confirmation bias affects an investor's capacity to adjust to new knowledge, frequently leading to less-than-ideal portfolio management.

H2: Risk propensity significantly mediates the relationship between confirmation bias and investment decisions

2.2 Endowment bias and Investment decisions

According to Ericson and Fuster (2014), endowment bias is a cognitive bias in which people overestimate the value of their possessions just because they own them. According to behavioral finance, this bias is a person's strong inclination to hold onto assets they already have rather than purchase comparable ones, which has a big impact on economic decisions and financial behavior.

The impact of endowment bias on investing decision-making has been the subject of recent research. Endowment bias can cause investors to overvalue their holdings, especially those they have inherited or purchased, according to research by Nguyen (2023) and Serpeninova et al. (2022). Because of this attachment, investors are more likely to experience unrealized losses on their

current equities rather than buy new ones of similar value, which frequently leads to irrational risk behavior. Ahmad & Shah (2020) and Banerji et al. (2022) have emphasized that endowment bias might result in an inflated feeling of value for held assets, which may influence risk-taking and portfolio management.

H3: Endowment bias has significant influence on investment decisions.

Risk propensity has an impact on how much endowment bias influences investment behavior. Endowment bias may be more likely to affect investors with low risk tolerance since their sensitivity to loss leads them to overvalue their current investments and refrain from selling them, even in the face of poor performance or market downturns. They might also "stick with what they know" rather than redistributing their holdings. Conversely, investors who are inclined to take on greater risk may be less susceptible to endowment bias because they are more inclined to accept the risks required to sell underperforming assets and reinvest in prospects with higher returns (Tversky & Kahneman, 1991).

H4: Risk propensity significantly mediates the relationship between endowment bias and investment decisions.

2.3 Recency Bias and Investment decisions

Recency bias in investors is the tendency to place undue emphasis on recently obtained information when making investment choices, probably leading to flawed results. Investors with recency bias may depend heavily at the latest information, even though it can no longer completely constitute the genuine marketplace conditions, leading to irrational investment behaviors (Alvia, 2011; Rose & Armansyah, 2022). Recency bias regularly arises due to the fact investors may not thoroughly apprehend the information or lack the ability to essentially examine it. This can foster an overconfidence that latest information will yield anticipated returns (Pinsker, 2011).

Previous studies have proven mixed effects regarding the consequences of recency bias. Research by Alvia (2011), Pinsker (2011), and Rose & Armansyah (2022) concluded that recency

bias has a positive effect on investment choices potentially growing the likelihood of decisions based on immediate information. However, Young (2010) discovered a negative effect, suggesting that recency bias can avert sound investment choices. Pinsker (2011) defined that recency bias leads individuals to recall only the latest facts and that, in sequentially provided information, it can distort decision-making because recent occasions might not appropriately reflect longer-term patterns.

H5: Recency bias has significant influence on investment decisions.

The degree to which investors respond to recency bias is influenced by their risk propensity, which is characterized as their tolerance or affinity for risk. Those with a high-risk tolerance might be more likely to respond to previous market swings, taking them as indicators of future success and basing their choices on the belief that current patterns will hold true. This may result in a greater exposure to speculative investments or high-risk assets. However, in reaction to recent market fluctuations, people who are not inclined to take risks could become overly cautious and prefer safer, low-risk investments even though they may get lower returns (Akerlof & Shiller, 2009). As a result, risk propensity and recency bias combine to influence investing choices; risk-averse investors may underreact to recent events, while risk-seeking investors are more likely to strengthen the effects of recency bias.

H6: Risk propensity significantly mediates the relationship between recency bias and investment decisions.

2.4 Risk Propensity and Investment decisions.

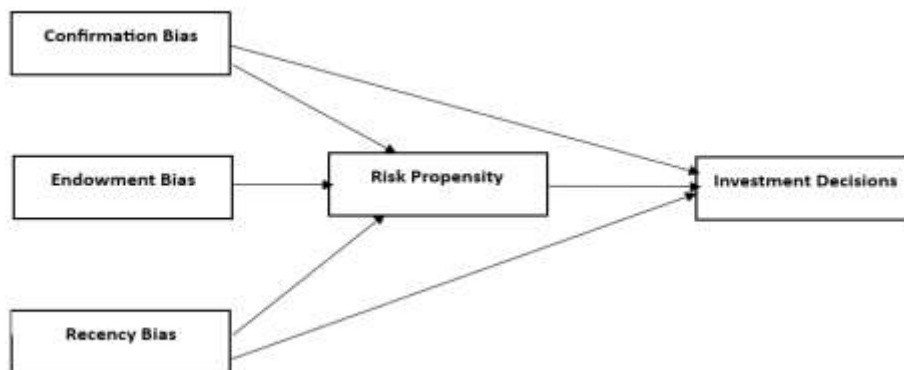
Investment decisions are greatly influenced by risk propensity, which determines an investor's willingness to assume risk in the hopes of achieving greater returns. People who have a high-risk inclination are more inclined to invest in high-risk assets, such equities or speculative assets, since they want to make more money even though they could lose it (Akerlof & Shiller, 2009). Low risk proponents, on the other hand, prioritize capital preservation above growth and typically

choose safer, lower-return investments like bonds or savings accounts (Markowitz, 1952). According to Barberis and Thaler (2003), investors' strategies, including as asset allocation and decision to enter or quit specific markets, are directly impacted by this diversity in risk tolerance. Risk propensity's influence on decision-making is further enhanced by its interaction with cognitive biases including confirmation bias and recency bias, which

frequently results in either unduly cautious or aggressive investment choices (Statman, 1999). In order to explain how and why investors make different investment decisions in various market settings, it is imperative to comprehend the function of risk propensity.

H7: Risk Propensity significantly influence investment decisions.

Figure 1: Theoretical Framework



METHODOLOGY

3.1 Research Approach

The approach adopted for this study is deductive. According to Robson (2011), the deductive approach is particularly effective for testing the validity of theoretical concepts through the collection and analysis of quantitative data.

3.2 Sampling Technique and Sample size

Convenience sampling technique is used for this study. In determining the sample size for this study, a sample size of 384 retail investors was chosen based on the recommendations from the Krejcie and Morgan table (KMT, Krejcie & Morgan, 1970).

3.3 Instrument Measures

The primary instrument of measurement for this study is a structured questionnaire. This questionnaire has been specifically designed to gather data from retail investors of the Pakistan Stock Exchange (PSX) and utilizes a 5-point Likert scale to measure responses, ranging from "Strongly Disagree" to "Strongly Agree." The structured

questionnaire has been adopted from earlier research studies to ensure reliability and validity. The items measuring risk propensity have been adopted from Keller and Siegrist (2006), while the items for recency bias have been taken from Pinsker (2011). The confirmation bias items have been adopted from Ozen and Erosy (2019), and the endowment effect items have been sourced from Pompian (2012). Additionally, the questionnaire items assessing individual investors' investment decision-making have been adopted from Weber et al. (2013) and Khan et al. (2017).

4 Data Analysis and Results

This study's data analysis relied on two main tools: SPSS and SMART-PLS. SPSS was used to look at demographic data, as it's great at managing large datasets and is a popular choice for summarizing and analysing basic statistics (Field, 2017). To examine how cognitive biases, investment decisions, and risk-propensity connect, SMART-PLS was chosen. It is particularly suited for structural equation modeling (SEM) when the research involves complex models with multiple

constructs and indicators, as it allows for the testing of theoretical models and hypotheses with high flexibility and predictive power (Hair et al., 2019). The demographic profile provided valuable insight into the sample composition. The gender distribution consisted of 59.1% males and 40.9% females. The age distribution was as follows: 16.7% were aged 18-25, 26.0% were aged 25-32, 39.6% were aged 32-39, and 17.7% were aged 39 or above. In terms of education, 9.9% had completed matriculation, 15.6% had intermediate education, 44.0% held a bachelor's degree, and

30.5% had a master's degree or higher. Regarding experience, 19.0% had less than one year, 26.0% had one to three years, 38.3% had four to five years, and 16.7% had more than five years of experience.

Table 1 shows the descriptive statistics for the variables. Skewness and kurtosis values were checked, and for normal distribution, they should fall between -1 and +1 (Hair et al., 2017). All variables in the study had skewness and kurtosis values within this range, indicating that the data were approximately normally distributed.

Table 1: Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
RB	384	1.00	5.00	3.5699	.98973	-.736	-.666
EB	384	1.00	5.00	3.6253	.90454	-.864	-.122
CB	384	1.00	5.00	3.5900	.91049	-.724	-.455
RP	384	1.00	5.00	3.5087	.92514	-.528	-.611
ID	384	1.00	5.00	3.5812	.86717	-.878	.079

Source: Author's Estimation

According to Hair et al. (2017), factor loadings should be above 0.50 to be considered adequate. In this study, all indicators meet this requirement, as shown in Table 2, confirming each indicator reliably measures its intended construct. Hair et al. (2017) also recommend that Cronbach's Alpha values should range from 0.70 to 0.95. In this study, all constructs (CB = 0.877, EB = 0.879, ID = 0.880, RB = 0.868, RP = 0.902) fall within this range, ensuring good internal consistency

reliability. Furthermore, Hair et al. (2017) suggest composite reliability (CR) values should be above 0.70. The CR values for all constructs in this study (CB = 0.910, EB = 0.912, ID = 0.906, RB = 0.910, RP = 0.927) exceed this threshold, confirming excellent reliability. For adequate convergent validity, AVE values should be at least 0.50 (Fornell & Larcker, 1981). All AVE values in this study (CB = 0.669, EB = 0.675, ID = 0.586, RB = 0.717, RP = 0.718) exceed this threshold, indicating good convergent validity.

Table 2: Model

Constructs	Loadings	Cronbach's Alpha	Composite Reliability	AVE
CB1	0.816	0.877	0.910	0.669
CB2	0.808			
CB3	0.820			
CB4	0.818			
CB5	0.828			
EB1	0.785	0.879	0.912	0.675
EB2	0.833			
EB3	0.810			
EB4	0.845			
EB5	0.833			
ID1	0.529	0.880	0.906	0.586
ID2	0.672			
ID3	0.813			
ID4	0.859			
ID5	0.837			
ID6	0.780			
ID7	0.812			
RB1	0.841	0.868	0.910	0.717
RB2	0.871			
RB3	0.829			
RB4	0.844			
RP1	0.824	0.902	0.927	0.718
RP2	0.829			
RP3	0.833			
RP4	0.864			
RP5	0.888			

Source: Author's Estimation

4.1 Hypothesis Testing

The hypothesis testing results, shown in Table 3, reveal the following: The relationship between Recency Bias (RB) and Investment Decisions (ID) has a significant positive connection, with a beta of 0.35, t-value of 4.50, and p-value of 0.000. However, the relationship between Endowment Bias (EB) and ID is not significant, as indicated by a β of 0.12, t-value of 1.20, and p-value of 0.230. Similarly, Confirmation Bias (CB) does not significantly affect ID, with a β of 0.08, t-value of 0.90, and p-value of 0.370. Risk Propensity (RP)

has a strong positive effect on ID, with a β of 0.40, t-value of 5.00, and p-value of 0.000. RP also significantly mediates the effects of RB, EB, and CB on ID. The mediating effect of RP between RB and ID has a β of 0.25, t-value of 3.80, and p-value of 0.000. For EB, the β is 0.15, t-value of 2.50, and p-value of 0.013. The effect between CB and ID shows a beta of 0.18, t-value of 2.80, and p-value of 0.005. Table 4 shows the indirect effects, where RP mediates all biases' effects on ID. The beta values for CB, EB, and RB are 0.053, 0.084, and 0.233, respectively, with p-values less than 0.05, confirming significant mediation.

Table 3: Direct Relationship-Path Coefficient

Path	Beta(β)	SD	T statistics	P values
CB -> ID	0.012	0.041	0.280	0.779
CB -> RP	0.131	0.038	3.480	0.001
EB -> ID	0.100	0.061	1.602	0.110
EB -> RP	0.206	0.046	4.480	0.000
RB -> ID	0.302	0.070	4.343	0.000
RB -> RP	0.570	0.049	11.592	0.000
RP -> ID	0.408	0.065	6.372	0.000

Source: Author's Estimation

Table 4: Indirect Effect-Mediation Effect

Path	Beta(β)	SD	T statistics	P values
CB -> RP -> ID	0.053	0.017	3.145	0.002
EB -> RP -> ID	0.084	0.024	3.573	0.000
RB -> RP -> ID	0.233	0.043	5.492	0.000

Source: Author's Estimation

5 Discussion

Our research looked at how different biases—recency, endowment, and confirmation—shape investment choices on the Pakistan Stock Exchange. We also examined if risk propensity plays a mediating role in these effects. First, we found that recency bias, where recent events weigh more heavily on decisions, does affect investors. This aligns with Barberis, Shleifer, and Vishny (1998), who showed that recency bias can lead to market overreactions. However, for endowment bias, we didn't find a significant effect on investment choices. This might be due to cultural influences (Weber & Hsee, 1998), market characteristics in Pakistan (De Bondt, 1998), or the fact that many investors in this market are new to investing (Barberis & Thaler, 2003). In such markets, people may focus more on short-term gains, which might reduce the impact of endowment bias.

The third bias, confirmation bias, also didn't show a significant impact on decisions. A likely reason is that investors can access a variety of information sources, which may balance out any strong

reliance on pre-existing beliefs (Rabin & Schrag, 1999). The Pakistan Stock Exchange's fast pace and transparency rules might push investors to consider a broader range of info (Shiller, 2000; Ball, 2009). When we looked at risk propensity, it did mediate the effects of recency and endowment biases, suggesting that how much risk someone's willing to take can change how these biases play out (Barberis et al., 1998; Weber et al., 2002). Yet, risk propensity did not mediate confirmation bias, possibly due to complex bias interactions and market dynamics (Bénabou & Tirole, 2002). Overall, this study shows that while recency bias and risk propensity matter, endowment and confirmation biases may be less influential here, pointing to unique market and cultural factors worth exploring.

5.1 Practical Implication

Investors, advisors, and policymakers can all benefit from the insights our research provides. It describes how risk propensity and particular biases, such as endowment, confirmation, and recency, affect investing choices. With this information, financial advisors can create plans that help investors make more well-rounded decisions. Investors may be better able to identify

and control these biases and make better decisions if they are taught about them. A longer-term viewpoint could be promoted, for instance, by teaching them about how recency bias can cause overreactions. Additionally, financial institutions could develop instruments that alert investors about biases and provide guidance according to their risk tolerance. Regulations could be created by policymakers to guarantee that investors are given clear information so they can make wise decisions.

6 Conclusion

The study aimed to understand how cognitive biases affect investment decisions in the Pakistan Stock Exchange, especially in an emerging market. It found that biases like recency, confirmation, and endowment biases influence how investors make choices. Risk propensity was also found to play a key role in mediating these biases. The findings support Prospect Theory, which explains how people often make irrational decisions based on perceived gains or losses, and the Theory of Planned Behavior, which shows how intentions, social norms, and control affect decisions. In a culture like Pakistan, where social influences are strong, these biases can be even more noticeable, making it important to address them for better investment decisions and a more stable market.

6.1 Limitations and Future Recommendations

One limitation of this study is that it relies on self-reported data from investors, which might cause biases, like people trying to present themselves in a better light or forgetting certain details. Also, the study focuses mainly on three biases—recency, endowment, and confirmation bias—and there might be other important biases that could also affect investment decisions. Since the research is based on a specific context, the results may not apply to other areas or types of investors. Another limitation is that the study is cross-sectional, meaning it only looks at data from one point in time, so it can't show how biases and risk tolerance change over time. Also,

using only a quantitative approach doesn't capture the full range of factors that can influence investor decisions, such as emotional or social factors. For future research, using qualitative methods could help explain investor behavior in more detail. Long-term studies could look at how biases and risk levels change over time. It might also be useful to explore a wider range of biases and their effects in different situations. Comparing results across different regions or groups of investors could give a better understanding of how culture influences investment decisions. Finally, testing ways to reduce biases in experimental settings could help improve decision-making. These ideas can contribute to further research in behavioral finance and help improve how investors make decisions.

REFERENCES

- Ahmad, M. (2022). The role of cognitive heuristic-driven biases in investment management activities and market efficiency: A research synthesis. *International Journal of Emerging Markets*. <https://doi.org/10.1108/IJOEM-07-2020-0749>
- Almansour, B. Y., & Arabyat, Y. A. (2017). Investment decision making among Gulf investors: Behavioural finance perspective. *International Journal of Management Studies*, 24(1), 41–71. <https://doi.org/10.32890/ijms.24.1.2017.10476>
- Akerlof, G. A., & Shiller, R. J. (2009). *Animal spirits: How human psychology drives the economy, and why it matters for global capitalism*. Princeton University Press.
- Akhtar, F., & Das, N. (2019). Predictors of investment intention in Indian stock markets: Extending the theory of planned behaviour. *International Journal of Bank Marketing*, 37(1), 97–119. <https://doi.org/10.1108/IJBM-08-2017-0167>

- Barberis, N., & Thaler, R. H. (2003). A survey of behavioral finance. *Handbook of the Economics of Finance*, 1, 1053-1128.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics*, 49(3), 307-343.
- Bénabou, R., & Tirole, J. (2009). Over my dead body: Bargaining and the price of dignity. *American Economic Review*, 99(2), 459-465.
- Cheng, C. X. (2019). Confirmation bias in investments. *International Journal of Economics and Finance*, 11(2), 50–55. <https://doi.org/10.5539/ijef.v11n2p50>
- Cyert, R. M., & James, G. M. (1963). *A Behavioural Theory of the Firm*. Englewood Cliffs, NJ: Prentice-Hall.
- De Bondt, W. F. (1998). A portrait of the individual investor. *European Economic Review*, 42(3-5), 831-844.
- Devlin, M., & Billings, A. C. (2018). Examining confirmation biases: implications of sponsor congruency. *International Journal of Sports Marketing and Sponsorship*, 19(1), 58-73.
- Dr. Aneesya Panicker, Dr. Avnish Sharma, D. S. G. B. K. G. (2020). Exploring the role of emotions and psychology in financial investment decisions in the Indian securities market. *International Journal of Advanced Science and Technology*, 29(1), 532-547. Retrieved from <http://sersc.org/journals/index.php/IJAST/article/view/3107>
- Ericson, K. M., & Fuster, A. (2014). The endowment effect. *Annual Review of Economics*, 6(1), 555–579. <https://doi.org/10.1146/annurev-economics-080213-041320>
- Field, A. (2017). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications. <https://doi.org/10.4135/9781526422965>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Fromlet, H. (2001). Behavioural finance theory and practical application. *Business Economics*, 7(1), 50–69.
- Fuller, R. J. (2000). Behavioural finance and the sources of alpha. Retrieved September 7, 2012, from <http://www.fullerthaler.com/downloads/bfsoa.pdf>.
- Goldberg, J., & Von Nitzsch, R. (1999). *Behavioural finance*. John Wiley & Sons.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24.
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, 117(3), 442-458.
- Ising, A., & Pompian, M. (2006). Behavioral finance and wealth management – How to build optimal portfolios that account for investor biases. *Financial Markets Portfolio Management*, 21, 491-492. <https://doi.org/10.1007/s11408-007-0065-3>
- Jureviciene, D., Bikas, E., & Gausienė, E. (2012). Behavioural finance during economic downturn in Lithuania. *Business: Theory and Practice*, 13(1), 75-83. <https://doi.org/10.3846/bm.2012.011>
- Jordan, B., & Miller, T. (2008). *Fundamentals of investments*. McGraw-Hill.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision making under risk. *Econometrica*, 47(2), 263-291.
- Kartini, K., & NAHDA, K. (2021). Behavioral biases on investment decision: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(3), 1231-1240.
- Keller, C., & Siegrist, M. (2006). Investing in stocks: The influence of financial risk attitude and values-related money and stock market attitudes. *Journal of Economic Psychology*, 27(2), 285-303.

- Khan, A. R., Azeem, M., & Sarwar, S. (2017). Impact of overconfidence and loss aversion biases on investment decision: Moderating role of risk perception. *International Journal of Transformation in Accounting, Auditing & Taxation*, 1(1), 23-35.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Kurniawan, B., & Murhadi, W. R. (2018). Bias aspect in decision making for buying life insurance in Indonesia. A paper presented at the 2nd International Seminar of Contemporary Research on Business and Management, 30–31 July 2018, Universitas Warmadewa, Denpasar, Bali.
- Lather, A. S., Jain, S., & Anand, S. (2020). The effect of personality traits on cognitive investment biases. *Journal of Critical Reviews*, 7(2), 221-229.
- Markowitz, H. (1952). Modern portfolio theory. *Journal of Finance*, 7(11), 77-91.
- Mahapatra, M. S., & Mishra, R. (2020). Behavioral influence and financial decision of individuals: A study on mental accounting process among Indian households. *Cogent Economics and Finance*, 8(1). <https://doi.org/10.1080/23322039.2020.1827762>
- Margolis, J. (1958). The analysis of the firm: Rationalism, conventionalism, and behaviourism. *Journal of Business*, 31(3), 187-199.
- Pinsker, R. (2011). Primacy or recency? A study of order effects when nonprofessional investors are provided a long series of disclosures. *Behavioral Research in Accounting*, 23(1), 161–183. <https://doi.org/10.2308/bria.2011.23.1.161>
- Pompian, M. M. (2012). Behavioral finance and wealth management: How to build investment strategies that account for investor biases. <https://doi.org/10.1002/9781119202400>
- Rabin, M., & Schrag, J. L. (1999). First impressions matter: A model of confirmatory bias. *The Quarterly Journal of Economics*, 114(1), 37-82.
- Ritter, J. R. (2003). Behavioral finance. *Pacific-Basin Finance Journal*, 11(4), 429-437.
- Robson, C. (2011). *Real world research* (3rd ed.). Wiley.
- Rose, J. B. D., & Armansyah, R. F. (2022). Recency bias dan confirmation bias pada keputusan investasi investor pasar modal Indonesia. *Jurnal Ilmiah Manajemen Dan Bisnis (JIMBis)*, 1(2), 136–152. <https://doi.org/10.24034/jimbis.v1i2.5366>
- Sharma, D., Misra, V., & Pathak, J. P. (2021). Emergence of behavioural finance: A study on behavioural biases during investment decision-making. *International Journal of Economics and Business Research*, 21(2), 223–234. <https://doi.org/10.1504/IJEBR.2021.113140>
- Shiller, R. J. (2000). *Irrational Exuberance*. Princeton University Press.
- Shefrin, H. (2002). *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*. <https://doi.org/10.1093/0195161211.001.0001>
- Simon, H. A. (1955). A behavioural model of rational choice. *The Quarterly Journal of Economics*, 69(1), 99-118.
- Simon, H. A. (1959). Theories of decision-making in economics and behavioural science. *American Economic Review*, 49, 253–283.

- Singh, H. P., Goyal, N., & Kumar, S. (2016). Behavioural biases in investment decisions: An exploration of the role of gender. *Indian Journal of Finance*, 10(6), 51–62.
<https://doi.org/10.17010/ijf/2016/v10i6/94879>
- Sewell, M. (2005). *Behavioural finance*. University of Cambridge.
- Sewell, M. (2007). *Behavioural finance*. University of Cambridge, revised (2010). <http://www.behaviouralfinance.net/behavioural-finance.pdf>
- Shefrin, H. (2002). *Beyond greed and fear: Understanding behavioral finance and the psychology of investing*. Oxford University Press.
- Shefrin, H. (2007a). *Behavioral corporate finance: Decisions that create value*. McGraw-Hill/Irwin.
- Statman, M. (1999). Behavioral finance: Past battles and future engagements. *Financial Analysts Journal*, 55(6), 18-27. <https://doi.org/10.2469/faj.v55.n6.2277>
- Thaler, R. H. (1999). The end of behavioural finance. *Financial Analyst Journal*, 55(6), 12–17.
- Trehan, B., & Sinha, A. K. (2021). A study of confirmation bias among online investors in virtual communities. *International Journal of Electronic Finance*, 10(3), 159-179.
- Uzar, C., & Akkaya, G. C. (2013). The mental and behavioural mistakes investors make. *International Journal of Business and Management Studies*, 5(1), 120-128.
- Verma, R., & Verma, P. (2007). Noise trading and stock market volatility. *Journal of Multinational Financial Management*, 17(3), 231-243.
- Weber, E. U., Blais, A. R., & Betz, N. E. (2002). A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision Making*, 15(4), 263-290.
- Weber, E. U., & Hsee, C. (1998). Cross-cultural differences in risk perception, but cross-cultural similarities in attitudes towards perceived risk. *Management Science*, 44(9), 1205–1217.
- Welford, R., & Mehta, K. (2014). Cognitive biases and their impact on investment decisions. *Journal of Behavioral Finance*, 15(4), 129-139.
- Young, J. (2010). Making financial education more effective: Lessons from behavioral economics. Working paper. Retrieved from <https://scholar.google.co.id/scholar?oi=bibs&cluster=7653368192880935142&btnI=1&hl=id>
- Yoong, J., & Ferreira, V. R. D. M. (2013). Improving financial education effectiveness through behavioural economics: OECD key findings and way forward. OECD Publishing, 1, 1926-1982. Available at https://www.oecd.org/daf/fin/financialeducation/TrustFund2013_OECDImproving_Fin_Ed_effectiveness_through_Behavioural_Economics.pdf