GOKUL BHANDARI

A TYPOLOGY OF PSYCHOLOGICAL BIASES INFLUENCING INVESTMENT DECISION-MAKING

Recent studies in investment and finance find that individuals make flawed investment decisions due to various psychological biases which are considered deviations from rational decision-making. Based on their primary characteristics and impact on investment decisions, biases can be classified into three types: cognitive, affective, and conative. Decision Support Systems (DSS) are designed to counter these biases. In the following paragraphs, we describe the nature of these biases and how they influence investors, and conclude with some ways in which DSS counter these biases.

"RECENT STUDIES IN INVESTMENT AND FINANCE FIND THAT **INDIVIDUALS MAKE FLAWED INVESTMENT DECISIONS DUE TO VARIOUS PSYCHOLOGICAL BIASES...**"

Cognitive biases are information-processing biases which motivate individuals to misjudge the true significance of new information. These biases are primarily triggered by the arrival of new information and are caused by the salience, order, patterns, and amount of information received by decision-makers. Some major cognitive biases in investment decision-making are: framing, representativeness, and ambiguity. A *framing* bias is said to occur when the manipulation of a decision frame changes the decision-maker's perspective about the problem. *Representativeness* refers to an individual's tendency to classify objects into different categories by observing only their representative or salient characteristics. The representativeness bias motivates people to ignore sample size, and mean reversion and become over-confident about the significance of the information received. For example, if a stock in the software industry is doing well, people may erroneously believe that all stocks in that industry are also doing well (sample size neglect)

and if the price of a stock has been rising for some time, people believe it has entered an "increasing trend" (neglect of mean reversion). *Individuals* experience ambiguity and make contradictory decisions when they are faced with conflicting, incomplete, uncertain or excessive information. Several pension studies document that plan participants tend to make their choices based on the "path of least resistance" to cope with the information ambiguity.

Affective biases involve strong emotional elements such as pride, regret and fear, and are triggered by the arrival of new information. Emotion influences decision-making in a major way. For example, the quest for pride and the desire to avoid regret often result in demonstrably unwise investment decisions. The *house money* and *disposition effects* are major investment-related affective biases. The house money effect refers to an individual's tendency to take high risk under the influence of recent gains. Although people are risk averse in gains and risk seeking in losses in one-stage gambles, they may take high risks in multi-stage gambles such as investing if they have recently made some profits.
The disposition effect refers to an individual's tendency to seek pleasure by realizing gains and avoid the pain of regret by avoiding the realization of losses. This is the exact opposite to what should be done due to tax consideration. Investors sell their rising stocks too early and hold their falling stocks too long due to the disposition effect.

Conative biases constitute general human tendencies (e.g., inertia) and are likely to exist in different cultures and across markets. The conative component in human judgment and decision-making is a metalevel process with strong developmental roots. Therefore, conative biases are persistent in nature and may exert their influences even in the absence of any new information. Major conative biases are *over-confidence*, *familiarity,* and *status quo*. Over-confidence, which refers to the systematic over-estimation of the accuracy and precision of one's knowledge, has been observed in several contexts of judgment and decision-making. Previous studies have found that people generally over-rate their qualifications and judgment capacity, and investors exhibit over-confidence even in such difficult tasks as stock selection. Familiarity bias is an individual's general tendency to prefer familiar objects or situations. Investors often invest major portions of their portfolio in companies that they are most familiar with. People may achieve familiarity due to geographical proximity or their industry knowledge and affiliation. Familiarity bias is a major cause of insufficiently diversified portfolios. Status quo bias is an individual's tendency to do nothing or maintain one's current or previous decision. Prior studies find that retirement plan participants do not change their portfolios and contribution rates for a long time due to the status quo bias, thereby forfeiting potential gains.

Based on our experimental study, we find evidence that properly designed computerized decision support tools can lower the impact of psychological biases on individuals' investment decision-making. In order to overcome the influence of cognitive biases, decision support systems (DSS) may follow an introspective de-biasing strategy in which the investor's assumptions and beliefs are challenged by the DSS by furnishing relevant and easy-to-understand information (e.g., providing a summary of critical data or changing their presentation format etc.). To overcome the impact of affective biases, DSS may follow a prospective de-biasing strategy in which investors are graphically shown the potential impact of their current investment decisions on their long-term investment goals with the objective of alerting them to any possible discrepancy. To ameliorate the effect of conative biases, DSS would follow a retrospective de-biasing strategy in which the investors are questioned about their past decisions and transactions with the goal of detecting persistent patterns of their behavioural biases, if any. We expect to see more research on this topic in the future.

BIOGRAPHY

DR. GOKUL BHANDARI is an Assistant Professor at the Odette School of Business, University of Windsor, Canada. He has Ph.D. (Management Science/Information Systems), MA (Economics), MBA, and Bachelor of Engineering degrees. He has published several peer-reviewed journal articles, conference proceedings, and book chapters in diverse fields, and has received many research grants. He was one of the first recipients of the CSIRF Scholarships in 2005 for his dissertation titled "Incorporating Cognitive Support in Investment Decision Support Systems." His primary research interest is in the area of design and development of computerized tools to assist individual investors. His research has been published in The Journal of Behavioral Finance, Journal of Economic Psychology, Financial Services Review, and Decision Support Systems.

TESTIMONIAL

THE GENEROUS FUNDING FROM THE **CSIRF** enabled me to design and develop a prototypical decision support system (DSS) in my doctoral study. The primary goal of the DSS was to assist individuals in overcoming their investment-related psychological biases. Without this financial support, it would have been very difficult for me to conduct the proposed experiment. Encouraged by the support of CSIRF, I continued working in the behavioural aspects of investment decision-making and I have had three journal publications in this area. Credit is also due to the CSIRF for my recent success in obtaining a SSHRC standard grant because the reviewers had such a high opinion of the CSIRF scholarship.