

Can Artificial Intelligence (AI) Manage Behavioural Biases Among Financial Planners?

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ABSTRACT

The main novelty of this paper is proposing artificial intelligence (AI) to manage behavioural biases in the financial decision-making process. An empirical study by Kahneman and Tversky identifies the evidence of behavioural biases in the investment decision-making process: a reversal of an established tenet in traditional finance. Financial planners are vulnerable to behavioural biases and are therefore unable to provide optimal investment solutions for their clients. Identifying the limitations of current practice, this research attempts to address how AI can help financial planners in subduing their behavioural biases and proposes the adoption of AI in financial planning services to circumvent behavioural biases. In recent years, AI has attained significant efficacy and has proven to be efficacious through supervised and unsupervised learning. Applying these AI techniques in mitigating behavioural biases, this study confirms that the backpropagation within the neural network and deep reinforcement learning can help overcome confirmation and hindsight biases.

KEYWORDS

Artificial Intelligence, Cognitive Biases, Confirmation Bias, Decision Making, Deep Learning, Financial Advisors, Financial Planners, Hindsight Bias, Reinforcement Learning

INTRODUCTION

Traditional economic theories assume that individuals act rationally, and the role of emotions or psychological issues is kept at bay in financial decision-making situations. In this decision-making process, the economic agents consider all the available information, process the collected information judiciously, and arrive at optimal financial decisions. The optimal decisions lead to the most desired

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outcome and help attain the financial goals of the individuals. However, behavioural finance and neuroeconomics research reveals that individuals are not entirely rational and susceptible to various biases. There are constraints in the decision-making process leading to biased decisions. The decision-making process occurs in the human brain through a mutual communication between the prefrontal cortex and hippocampus with neural connectivity (Weilbacher & Gluth, 2016; Moghadam, Khodadad & Khazaeinezhad, 2019). Wang (2008) suggests that the prefrontal cortex estimates the required information for the decision-making process and then obtain this information from the hippocampus. However, along with the cognition process for decision making, the hippocampus channels emotional experience during this procedure. Consequently, the decision-making process is susceptible to biases. In his ground-breaking research, Simon (1967) contends that the system will be incomplete without taking emotions and situational constraints into the decision-making process producing sub-optimal decisions. Financial planners who regularly take financial decisions for their clients also exert biases in their decision-making process (Akhtar & Das, 2020). Baker *et al.* (2017) assert that financial planners' psychological biases can lead to flawed economic decisions. Understanding personality traits and effective behaviour management techniques positively influence financial decisions, but unfortunately, this is not effectively explored (Pompian, 2012).

Background and Research Gap

In our current fourth industrial revolution, Artificial Intelligence (AI) offers a new sense of hope to combine human intellect and machines to resolve the biases in the decision-making process. Several studies have already identified the use of AI for decision-making purposes. In a recent paper, Bogoviz (2020) shows that AI leads to a human-artificial intelligence framework and data intelligence and analytics for effective decision-making purposes for businesses. Duan *et al.* (2019) and Pillai *et al.* (2020) demonstrate that the integration of AI into a business setting offers tangible benefits through effective decisions. Although AI influenced human service jobs are well established (Huang & Rust, 2018), the authors find no research on how AI can help financial planners deal with biases. In this conceptual paper, we will reflect on the biases of the financial planners and propose AI as a possible solution to overcome biases in the financial decision-making process. In this case, the research will use two specific cognitive biases i.e., confirmation and hindsight biases and demonstrate how AI can resolve these biases.

Behavioural finance classifies the biases into two categories: cognitive and emotional biases (Baker & Nofsinger, 2002; Al-Dahan, Hasan & Jadah, 2019). Pompian (2012) defines that cognitive biases arise from faulty cognitive reasoning; whereas, emotional biases result from the emotions' influence. Unlike in traditional economics, bounded rationality is commonly assumed in behavioural economics in that decisions cannot be made rationally, thereby resulting in cognitive biases, as pointed out by Kahneman (2011), Tversky and Kahneman (1974) and Kahneman and Tversky (1984). Kahneman and Tversky (1984) stated that humans' cognitive information processing, conducted through either of the following processes. System 1, where the operation is quick, automatic, without much time consumption and intuitive, with little or no effort, and System 2, requires effortful, demanding and deliberate mental activities.

Nevertheless, a heuristic approach of cognitive information processing, adopted when there is a time constraint, is based on System 1 and is intuitive and straightforward. However, such methods frequently suffer from cognitive biases. Because of these cognitive and emotional biases, individuals cannot process the information optimally. Cognitive biases are hypothesised to distort decision making, thereby leading to human errors in judgment, decision making and behaviour, eventually (in the worst case), triggering incidents, crashes, collisions or disasters if the commitment to the biased judgment, decision making and behaviour is escalated (Murata and Nakamura, 2014; Leković, 2020).

Literature Review

Our evaluation in the financial planning industry literature indicates two approaches taken to circumvent the behavioural biases for optimal financial decisions for the clients. These are psychographic

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