Chapter 13
Artificial Intelligence in Behavioral Finance for Investment Decision-making

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ABSTRACT

This chapter talks about how artificial intelligence has evolved into the minds of investors. Owing to the transformation in technology, machines have become increasingly capable. This will help to predict market movements using the behavioral aspect of the investors. There are also challenges in using AI in behavioral finance, such as the need for high-quality data, the potential for bias in AI algorithms themselves, and ethical considerations around using AI to make investment decisions. How these challenges will have an impact on investment decision-making is also discussed in this chapter. Further, the chapter talks about the interaction of behavioral finance and artificial intelligence and in turn enabling investors to be future-ready with fewer biases and efficient decision-making.

1. INTRODUCTION

In the late 1980s, Professors Richard Thaler, Robert Shiller, Daniel Kahneman, Amos Tversky, Vernon Smith, Meir Statman, and Hersh Shefrin began to publish relevant pieces of research that gave light to the Behavioral Finance field. In a nutshell, the growing interest in Behavioral Finance has resulted from an accretion of empirical anomalies. It has been established that human cognitive intuitions have taken away investors' rationality when it comes to stock investment decision-making (Sarin & Chowdhury, 2018). Investors think of themselves as rational and logical. But at the time of decisions related to investment, they tend to be emotionally prone and make mistakes (Sarin, 2023). The main point during investment decisions is the consideration of the investor's decision-making process. Proper evaluation

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of the alternatives that are available to investors is the key to any investment decisions (Sarin, 2023). Time and consideration of cognitive psychology play an important role in the behavioral impact of investment decisions. Therefore, for effective decision-making, the investors need to develop a positive vision, emotional stability, perseverance, and foresight (Sarin& Chowdhury, 2018; Sarin, 2023).

Avoiding any mistakes requires a more authentic approach and reduces human errors. This requires the need for Artificial Intelligence (AI) which is an upcoming technology to map the human thinking process. Machine learning (ML) and Artificial Intelligence have opened the world of finance to the new world of technology. A large data can be collected with just a click of a button to predict future trends to make maximum returns and incomes. The business world is coming out of the paper era to the digital world and it will be exciting to see how technology would bring about this change.

However, there are also challenges in using AI in behavioral finance, which can be the high-quality data needs, the biases in AI algorithms themselves, and ethical considerations around using AI to make investment decisions. As such, the use of AI in behavioral finance should be approached with caution and care and should be balanced with human judgment and oversight.

It can be seen that AI algorithms can help in improving investment decision-making algorithms analyse large quantities of data and recognize trends and patterns that may be hard for humans to spot. This can help investors make more informed decisions based on objective data (Hilovska & Koncz, 2012). AI algorithms can use predictive analysis to forecast future market trends and help investors make more accurate investment decisions. It can be used to manage risks associated with investments by analyzing data and providing alerts when certain risk thresholds are exceeded. It can optimize investment portfolios by analyzing historical data and recommending the best portfolio based on an investor's objectives and risk nature (Pietikäinen & Silven, 2022). Overall, the use of AI algorithms can help investors make more informed and objective investment decisions, while also improving risk management and portfolio optimization. However, it is important to note that AI algorithms should be used in conjunction with human judgment and oversight, as there are limitations and potential biases associated with relying solely on AI for investment decision-making.

2. ARTIFICIAL INTELLIGENCE IN FINANCE

To understand artificial intelligence, there are a few prerequisites like discussing human intelligence, though the same is itself debatable in psychology (Conway & Kovacs, 2015). Despite the difficulty of describing and measuring human intelligence, the main thing is that AI seeks to mimic some features of social intellect like emotions, learning, inventiveness, self-awareness, language, problem-solving, cognitive thinking, or tactics (Russell & Norvig, 2010).

AI can be defined as "the capability of a machine to imitate aspects of human intelligence". Alan Turing's (1950) revolutionary paper came with many thoughts that ultimately became the base for AI, including ML, DL, and others (Russell & Norvig, 2010). AI intelligence encompasses the capacity to think, problem-solve, acquire knowledge, and combine various human abilities such as perception, thinking, memory, communication, and planning (Kopka &Grashof, 2022); Kar et al., 2022). However, disparities started in the field of computer science (Russell & Norvig, 2020, pp. 19–23), where this term was invented in the year 1955(Russell & Norvig, 2020, pp. 19–23). The timeline of AI is as below: