Chapter 13

A Systematic Analysis Approach of AI's Role in Enhancing Financial Decision-Making

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ABSTRACT

This paper aims to analyze the intellectual structure and research directions pertaining to about the impacts of AI on financial decision-making. A systematic bibliometric review was conducted, in which datasets were retrieved from both Scopus and Web of Science databases. After merging and applying all inclusion criteria, a final set of 235 datasets was analyzed in October 2024 using software tools provided by RStudio-Biblioshiny and IRaMuTeQ. This mirrors the intellectual structuring around the clusters in predictive modeling, risk management, and responsible finance. This research enhances a better understanding of the applications of AI and their impact on financial decision-making. These include looking at the effect of AI on ethics and transparency in the governance of financial systems. This paper contributes to new knowledge of advanced technologies integrated into finance and suggests ways to pursue further research.

INTRODUCTION

Interest in artificial intelligence (AI) applications in finance has grown exponentially in recent years, driven by AI's ability to streamline processes, enhance economic forecasting, and improve risk management strategies (Henrici & Osterrieder, 2022). AI's role in financial decision-making is transforming the field, enabling faster, more data-driven, and accurate decisions (Akour et al., 2024). While considerable progress has been witnessed in these respects, the extant body of research concerning AI applications in finance is diverse, e.g., machine learning in banking Ai notation systems, fintech, big

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data processing, portfolio and markets prediction, and so on (Bansal et al., 2021). It epitomizes the need for systematization to bring out the priority areas, gaps, and broader implications for AI technologies in financial decision-making.

While many studies focus on specific applications of AI in portfolio management, risk assessment, and fraud detection, most of them are weak in the analysis of the framework that can be used to analyze collaborations, thematic structures, or behavioral biases that AI might reduce or maybe introduce. In their absence, the potential of AI in improving financial decision-making cannot be fully actualized, and consequently, both the theoretical and practical applications remain under-explored. Furthermore, little attention has been paid to the mapping of the evolution of knowledge in this field, which has left major questions about its intellectual structure and geographic distribution unanswered. This study will fill this gap by taking a bibliometric and lexicographic analysis approach to the role of AI in financial decision-making.

By using tools such as R-Biblioshiny and IRaMuTeQ, this study systematically analyzes the existing literature to: (1) identify priority themes in the domain; (2) analyze co-authorship networks to uncover collaborative dynamics; and (3) explore cognitive biases and decision-making methods supported by AI technologies. The analysis covers articles published between 2006 and 2024, hence providing an overall view of its growth trajectory, intellectual structure, and trends in this fast-changing field. This study takes a detailed view of how research in AI and financial decision-making has evolved by applying scientometric mapping and content analysis techniques. This systematic review also identifies the major research fronts and existing gaps, hence providing a foundation to guide future research and optimization of the implementation of AI in the financial sector. Results hold promise to further the theoretical understanding of—and practical applications yielding insight valuable to academic researchers, industry professionals, and policymakers. This paper is organized as follows: Section 2 reviews the literature on AI in financial decision-making; Section 3 describes the methodology used, including the criteria of article selection and tools used for analysis; Section 4 presents the results and discusses key findings; Section 5 summarizes the implications and suggests future research directions, together with the limitations of the study.

LITERATURE REVIEW

Artificial intelligence (AI) has seen a vertiginous growth in its use in the financial sector. it has enabled us to consider and adopt totally new approaches to decision-making, based on data analysis algorithms. this makes it possible to consider AI as a powerful tool for transforming financial practices and processes. because it enables us to analyze massive amounts of data (Bigdata) in real time, and to answer complex questions by drawing up reliable financial forecasts. A number of studies have looked at the application of AI to stock market forecasting, portfolio management, auditing and risk analysis (Ewerton & Jordão, 2024; Kumar, 2024). Machine learning models, for example, have contributed to the optimization of trading strategies and the performance of financial asset management. According to Binh, (2024), deep neural networks represent a major advance over traditional stock price forecasting models, thanks in particular to the introduction of variables such as historical data and macroeconomic variables. They would thus enable financial analysts, in real time, to monitor market developments and react to international economic shocks (Hussain et al., 2021). Despite these advances in artificial intelligence, there are still challenges ahead, such as, the transparency and reliability of the decisions made by