Applications of Big Data Analytics in Investment Management:
A Review and Future Research Agenda Using TCM Framework

Prajwal Eachempati, Trinity Business School Trinity College Dublin, Ireland*

Praveen Ranjan Srivastava, Indian Institute of Management, Rohtak, India

https://orcid.org/0000-0001-7467-5500

ABSTRACT

Big data has emerged as an important resource for generating wealth in society along with capital and labour, as data analytics generates valuable information and provides critical insights to gain competitive advantage. In investment management, access to information is vital. As analytics causes information asymmetry among those who use it and others, it has become a key result area in the domain. IM involves multi-criteria decision-making necessitating managers to acquire core capability in analytics. The field of IM is passing through rapid changes, with varying customer preferences, advancing technologies, diminishing margins, acute competition, in the midst of increase in compliances. Cockpit monitoring and goal-based portfolio preferences by some large customers have complicated IM. The paper explores the rationale for implementing big data analytics and identifies evolving tools and technologies that are applicable in the domain. The paper also highlights a few emerging areas of research in the field using both bibliometric analysis and systemic literature review techniques.

KEYWORDS

Analytics (BDA), Bibliometric Analysis, Big Data, Business, Database, Domains, EBSCO, Finance, Scopus, Tools, WOS

INTRODUCTION

Investment management (IM) is a data-driven field where analytics aims to provide solutions across the data value chain continuum for improved performance. Globalization, deregulation, improved lifespan of people and economic reforms across nations have created newer opportunities with increased fund managers' responsibilities. Visualization of portfolio performance, complete transparency on investments, and shrinking margins due to the 'Fulcrum fee' structure (linking fees with performance) require the deployment of innovative tools. Increasing regulatory compliance costs with no assurance of new business without showing performance-based fund alpha in the volatile investment world have made funds management complex. Improved performance requires a holistic understanding of the factors and processes involved in deriving competitive advantage from analytics with active

*Corresponding Author

organizational support and cultural transformation. Due to the heterogeneity and size of the data and availability of 'Open-Data,' the efforts required to retrieve relevant information and harness value from the big data are impossible without advanced analytical tools (Dean and Ghemawat, 2008; Maté et al., 2015; Galetsi et al.,2020; Yu et al.,2021). The volume of investible assets is projected to cross $100 trillion soon, with a portfolio of assets under management from developing economies like South America, Asia, the Middle East, and Africa set to rise (Asset Management,2020). Thus the managers from developing economies need to invest in analytics for making informed decisions in the place of intuitive judgment. Analytics is now a socially relevant activity for resource mobilization and gainful deployment of scarce resources across all sectors. The paper explores the role of analytics in investment management (Allison, 2017; Pattekar, 2019) using raw finance data analysis and its variants that impact decision-makers.

Motivation for the Study

Though finance managers use the 'Excel' tool for analytics, they prescribe big data analytics to others for financial analysis (Batra, 2017; Chua and Storey,2016). An investment management activity's business mission is to enrich its clientele with the best wealth management policies, practices, and products and serve its stakeholders and society at large by deploying the best talent and technologies.

Chhabra (2005) states that the demand for building portfolios to satisfy individual investors' priorities and preferences and protect them from risk factors linked to "goal-based asset allocation" (GBAA) is growing among high net-worth investors. A criticism of GBAA is that it could mean facing risk involved in an uneven diversified portfolio, though it provides insights into how different time frames will impact an investor's ability to tolerate risk. For example, high net worth investors expect that the portfolio meets their financial goals but leaves market volatility risk problems to investment managers (Ribeiro, 2019). Thus, it is essential that the portfolio simultaneously weighs short-term consumption needs, emphasizing long-term growth. A study on whether risk tolerance questionnaires predict investors' risk-taking decisions found that return expectations and demographic variables are significant predictors of risk-taking decisions and not risk tolerance questionnaires (Sivarajan & De Bruijn,2021). Thus, cross-fertilization of modern portfolio theories with behavioral finance is systematized for using big heterogeneous data. In this context, a review of existing literature is conducted considering the views of various consulting groups, industry, government, academicians, researchers, economists, statisticians, data scientists, and technologists at the global level as under (i) Research at the global level (ii)Potential areas of research in investment management domain and (iii) Tools and techniques in big data analytics. The summary of the findings forms part of the paper. The rest of the paper is structured as follows.

The overall research model adopted in the paper and the justification for adopting a two-fold literature review analysis with both bibliometric analysis and systematic literature review is elucidated in Section 2. The extant literature of big data analytics in investment management is bibliometrically analyzed in Section 3, followed by the analysis findings in Section 4. Section 5 represents the challenges and issues in the current research. The directions for future research of big data analytics in the investment management domain are presented in terms of a Theory, Methodology, and Context (TMC) framework in Section 6. The study's contributions in terms of theoretical and practical contributions are provided. The study is concluded both in Section 7. The references are stated.

RESEARCH MODEL FOR LITERATURE REVIEW

The paper aims to analyze the evolution of big data analytics tools and technologies in the domain of investment management and provide a future research agenda for researchers to further explore this area and conduct innovative research.

The domain of investment management is expanding exponentially. Every day, thousands of new articles, conference papers and publications emerge. However, the body of research is found to be an

30 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/article/applications-of-big-data-analytics-in-investment-management/299557

Related Content

Effects of Graphical Versus Textual Representation of Database Structure on Query Performance
Wesley Jamisonand James T.C. Teng (1993). *Journal of Database Management (pp. 16-24).*
www.irma-international.org/article/effects-graphical-versus-textual-representation/51114

Convolutional Recurrent Neural Networks for Text Classification
Shengfei Lyuand Jiaqi Liu (2021). *Journal of Database Management (pp. 65-82).*
www.irma-international.org/article/convolutional-recurrent-neural-networks-for-text-classification/289794

Extended Spatiotemporal UML: Motivations, Requirements and Constructs
Rosanne Price, Nectaria Tryfonaand Christian S. Jensen (2000). *Journal of Database Management (pp. 14-27).*
www.irma-international.org/article/extended-spatiotemporal-uml/3255

The Expert's Opinion
Journal of Database Management (1993). *Journal of Database Management (pp. 39-41).*
www.irma-international.org/article/expert-opinion/51116

The Role of Rhetoric in Localization and Offshoring
Kirk St. Amant (2009). *Handbook of Research on Innovations in Database Technologies and Applications: Current and Future Trends (pp. 844-851).*
www.irma-international.org/chapter/role-rhetoric-localization-offshoring/20770