

# Blockchain applications in stock market prediction: A bibliometric analysis of research trends and emerging themes (2015–2025)



K. Nirmala Devi<sup>a</sup> ✉ | Lakshmi Narasimha<sup>a</sup> | N. Sujatha<sup>a</sup> | Y. Geetha<sup>a</sup> | S. Praveena<sup>a</sup> | K. Ameena Taiba<sup>a</sup>

<sup>a</sup>Department of Computer Applications, Madanapalle Institute of Technology & Science, Madanapalle, Andhra Pradesh, India.

**Abstract** The integration of blockchain technology into financial markets has sparked significant scholarly interest, particularly in the context of stock market prediction. This bibliometric analysis aims to provide a comprehensive overview of research trends, influential publications, and emerging themes within this interdisciplinary domain from 2018 to 2025. Drawing data from Scopus the study utilizes bibliometric tools such as Biblioshiny and VOSviewer to analyse publication outputs, citation patterns, co-authorship networks, and keyword co-occurrence. The findings reveal a consistent growth in academic contributions, especially after 2019, reflecting blockchain's increasing relevance in financial prediction and its convergence with machine learning, deep learning, and artificial intelligence. Key research clusters identified include algorithmic trading, decentralized finance (DeFi), cryptographic modelling, and predictive analytics. The analysis also highlights leading journals, authors, and institutions contributing to the advancement of this field. However, certain limitations are acknowledged. The focus on selected databases may have excluded valuable contributions from platforms such as IEEE Xplore, SSRN, or non-indexed proceedings. Additionally, the keyword-based search strategy may have overlooked studies using alternative terminologies. The temporal scope may also bias the analysis toward recent developments while underrepresenting foundational research. The study offers a valuable reference point for scholars and practitioners, mapping the intellectual structure and thematic progression of blockchain-based stock prediction research. Future studies are encouraged to adopt multi-database approaches, combine quantitative and qualitative methods, and explore regulatory and regional variations to enrich understanding and guide practical implementation.

**Keywords:** blockchain, stock market prediction, financial forecasting, artificial intelligence (AI), machine learning (ML), bibliometric analysis

## 1. Introduction

Emerging technologies such as blockchain, artificial intelligence (AI) and machine learning (ML), have changed financial markets in recent years. Blockchain is one type of emerging technology that has gained attention for its ability to increase transparency, security, and decentralization of financial transactions and data handling; originally designed to support cryptocurrencies, it has been applied across multiple sectors such as smart contracts, decentralized finance (DeFi), and building immutable audit trails for stock trading and investment environments.

Blockchain's capacity to bolster transaction integrity and audit trails is supported by various studies, highlighting its decentralized and distributed networks that create immutable ledgers, which enhance data provenance and security measures (Abdullah et al., 2020). The implications for finance are significant, as this technology can reduce fraud risk by ensuring the integrity of transaction processes through verifiable audit trails (Han et al., 2024). The integration of Internet of Things (IoT) information with blockchain also enhances trust by providing verified collateral information, thereby decreasing reliance on intermediary parties. This combination of transparency, trust, and security positions blockchain as a transformative technology in the financial sector. Artificial intelligence and machine learning also play crucial roles in this technology-driven landscape. These technologies support the automation and optimization of financial processes, enabling organizations to utilize large datasets for predictive analytics and strategic decision-making. For instance, AI-driven innovations can significantly improve financial planning and risk assessment (Wang, 2023). Recent advancements in AI have led to the development of "smart FinTech," which applies data science and AI techniques to transition traditional financial operations into intelligent, automated, and personalized services (Subagio & Sitepu, 2023). Applications of AI in finance include improved customer experiences, risk management, and investment strategies, thereby reshaping how financial services are delivered. The convergence of blockchain with AI and ML has spurred remarkable developments in financial technologies. For instance, blockchain integration facilitates decentralized finance applications that leverage trust less protocols for transactions, while AI algorithms can optimize trading strategies and risk assessments in real-time (Belhadi et al., 2024). Additionally, the use of smart contracts

allows for the automatic execution of financial agreements based on predefined criteria, further reducing the need for intermediary oversight (Kim et al., 2022). Market integrity is eventually improved by such innovations, which also guarantee increased adherence to governance and regulatory standards while streamlining procedures (Kazachenok et al., 2023).

The interplay between blockchain, AI, and ML represents a pivotal shift in financial markets, driving transformations that promise to enhance transparency, security, and operational efficiency. As these technologies continue to evolve, their synergistic effects are expected to shape the future of finance, creating a dynamic ecosystem that fundamentally redefines traditional practices. The realm of stock market prediction remains a complex yet critical focus for investors, policymakers, and researchers due to its inherent intricacies. The task of forecasting stock prices demands extensive analysis of a variety of historical data, including investor sentiment, market trends, and macroeconomic indicators. These factors tend to exhibit non-linear, dynamic characteristics and are significantly influenced by numerous interconnected variables (Bauvars, 2021). The combination of blockchain technology and data-driven predictive modeling offers previously unheard-of chances to improve the precision, openness, and dependability of stock price forecasting systems. The potential of blockchain technology to enhance financial processes has generated a lot of interest, especially because of its enhanced security and decentralization features. Blockchain makes sure that stock market data can be safely recorded and validated by providing a distributed and unchangeable ledger, which promotes trust among market players (Agarwal et al., 2023). Blockchain technology, for example, can give investors access to real-time stock price and other market data, enabling them to take prompt action on information that may influence their decision-making. Errors and mistrust, which are prevalent in traditional centralized systems, may be considerably decreased by this information tool (Pal et al., 2021). Predictive modeling and blockchain integration can solve a number of issues with conventional stock market analysis. As Mokhtari pointed out, the safe sharing and verification features of blockchain can improve machine learning (ML) and artificial intelligence (AI) approaches, improving prediction accuracy. Additionally, compared to traditional approaches, the use of hybrid models has demonstrated encouraging results in capturing market dynamics (Arshi & Padma N, 2022) By combining these concepts, it is possible to create more reliable models that make use of large datasets, lower risks, and enable more intelligent investment choices. The scholarly investigation of blockchain's incorporation into stock market forecasting is still fragmented in spite of these developments. There is a tendency in the literature today to concentrate primarily on blockchain applications in finance or the creation of AI-based stock forecasting models, with little empirical research on the effectiveness of both approaches taken together (Lo & Medda, 2020). This dearth of thorough research emphasizes the need for a coordinated strategy to investigate the ways in which blockchain technology and state-of-the-art machine learning methods can work together to improve stock market forecasting.

A bibliometric analysis can help close this gap by offering insightful information about the changing field of study at the intersection of stock market prediction and blockchain technology. Key themes, publication trends, and significant contributors can be found by methodically classifying and evaluating the body of existing literature, which will ultimately provide a clearer path for future research projects. This project is essential for academic communities and business professionals who are eager to understand the opportunities and challenges that blockchain technologies bring to financial market analysis.

Despite the growing body of research on blockchain applications in finance and the use of AI for stock market prediction, few studies have employed bibliometric methods to systematically explore the convergence of these domains. Existing bibliometric analyses tend to focus either on blockchain's role in financial services or on machine learning techniques in isolation, overlooking the interdisciplinary synergy that characterizes modern fintech innovation. This study addresses that gap by applying bibliometric tools to map the intellectual structure, thematic evolution, and collaborative networks within this emerging nexus. By doing so, it offers a novel perspective on how blockchain and AI-driven predictive analytics are shaping the future of financial forecasting, providing both academic and practical insights.

The study will map thematic clusters and intellectual structures based on keyword co-occurrence and bibliographic coupling; identify the most prominent journals, authors, and countries that contribute to the literature; analyze publication and citation patterns within the discipline; and suggest potential research gaps and avenues for future inquiry.

## **2. Materials and Methods**

### *2.1. Research Design*

To investigate the intellectual, conceptual, and social structure of scholarly literature at the nexus of blockchain technology and stock market prediction, this study uses a quantitative bibliometric analysis approach. To evaluate the evolution of a research domain, bibliometric analysis makes it possible to map scholarly output systematically using citation patterns, co-authorship networks, keyword co-occurrence, and other quantitative indicators.

### *2.2. Data Source*

The Scopus database, renowned for its stringent inclusion criteria and multidisciplinary coverage, is one of the most extensive and popular scientific indexing platforms. Because of its broad indexing of excellent peer-reviewed literature, including journals from fields related to the study, such as computer science, finance, and engineering, Scopus was chosen.

### 2.3. Search Strategy

A thorough Boolean search query was created using keyword combinations associated with blockchain, financial markets, and predictive modeling in order to find the most pertinent literature. The following was the final search string.

("blockchain" OR "distributed ledger technology" OR "DLT" OR "cryptocurrency") AND ("stock market" OR "financial market" OR "equity market" OR "share market" OR "capital market") AND ("prediction" OR "forecasting" OR "price prediction" OR "trend analysis" OR "volatility analysis" OR "financial modeling" OR "machine learning" OR "deep learning")

### 2.4. Prisma

The methodical procedure used to find and filter the pertinent literature for this bibliometric analysis is described in the PRISMA flow diagram. A thorough Boolean query that covered blockchain, financial markets, and predictive modeling was used in the first search, which yielded 558 documents from the Scopus database. A language filter was used to restrict the dataset to English-language publications in order to guarantee consistency and accessibility; this resulted in 524 records. The dataset was then trimmed to only contain peer-reviewed journal articles; conference papers, editorials, and other non-article formats were left out. Conference papers were excluded due to inconsistent peer-review standards, limited citation data, and metadata irregularities that could compromise the accuracy of bibliometric mapping. A final dataset of 224 articles that were judged appropriate for bibliometric analysis was produced by this step. In order to identify publication trends, citation networks, keyword co-occurrence patterns, and collaborative structures, these records—which serve as the study's central component—were further examined using VOSviewer and Biblioshiny. The Figure 1 shows a clear and systematic approach.

## PRISMA Flow Diagram

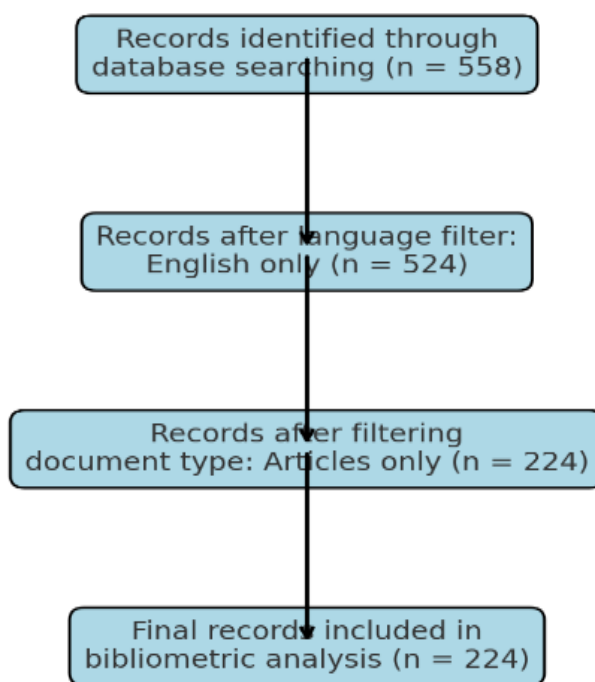


Figure 1 PRISMA Article Selection Framework for Bibliometric Analysis.

## 3. Results

### 3.1. Bibliometric Mapping and Analysis Using Biblioshiny

#### 3.1.1. Main Information on the Dataset for Blockchain and Stock Prediction Research

The main characteristics of the bibliographic dataset are summarized in Table 1, which provides an overview of the time span, sources, authorship patterns, document types, and citation metrics. The final dataset is made up of 224 peer-reviewed journal articles from 129 different sources, including books, journals, and conference proceedings, that were published between 2018 and 2025. There is a rapidly growing scholarly interest in the nexus between blockchain technology and stock market prediction, as evidenced by the 42.04 percent annual growth rate of publications. The majority of the contributions appear to be recent, as indicated by the average age of the documents, which is roughly 2 to 53 years, further highlighting the

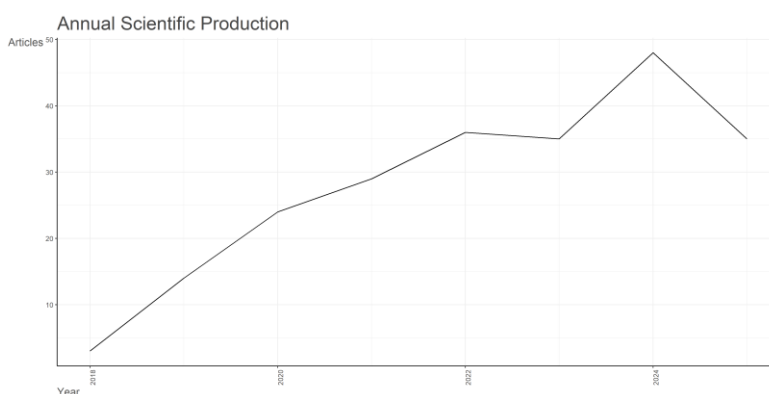
novelty and developing nature of the research field. Each document has, on average, 21–44 citations, indicating a moderate but increasing influence within the academic community. With 9,796 sources cited overall, the dataset shows a high degree of scholarly engagement and intellectual integration with related fields like machine learning, financial analytics, and artificial intelligence. A broad theme is reflected in the content analysis, which yields 697 author keywords and 947 Keywords Plus.

**Table 1** Main Information on the Dataset for Blockchain and Stock Prediction Research.

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2018:2025
Sources (Journals, Books, etc)	129
Documents	224
Annual Growth Rate %	42.04
Document Average Age	2.53
Average citations per doc	21.44
References	9796
DOCUMENT CONTENTS	
Keywords Plus (ID)	947
Author's Keywords (DE)	697
AUTHORS	
Authors	671
Authors of single-authored docs	26
AUTHORS COLLABORATION	
Single-authored docs	27
Co-Authors per Doc	3.31
International co-authorships %	29.46
DOCUMENT TYPES	
article	224

### 3.1.2. Annual Scientific Production of Articles Related to Blockchain and Stock Market Prediction

The yearly scientific output of articles on blockchain applications in stock market prediction is depicted in Figure 2, which shows a clear upward trend between 2018 and 2024. Publications increased gradually from just three articles in 2018 to a peak of forty-seven articles in 2024, demonstrating the growing scholarly interest in this multidisciplinary field. Rapid developments in decentralized finance (DeFi), the spread of trading models powered by artificial intelligence (AI), and the growing incorporation of blockchain technology into financial analytics are all responsible for this spike. Even though 2025 sees a slight decline, the volume of publications is still much higher than in previous years, suggesting that the field has entered a period of sustained scholarly engagement. Temporary causes like ongoing research projects, indexing delays, or a changing focus of research within the blockchain-fintech ecosystem could be the cause of this decline. Overall, a day is highlighted by the annual production trend.



**Figure 2** Annual Scientific Production of Articles Related to Blockchain and Stock Market Prediction.

### 3.1.3. Average Citations per Year for Articles on Blockchain and Stock Market Prediction

The average number of citations received per article per year for publications pertaining to blockchain applications in stock market prediction is shown in Figure 3. According to the data, 2019 was a year of high impact, with articles published in that year receiving an average of more than 12 citations. This might be explained by the originality of early multidisciplinary research that connected blockchain technology with financial forecasting, which quickly attracted interest from the computer science and finance communities. But starting in 2020, the average number of citations per year gradually decreases, with



values dropping below 6 citations after 2021 and hitting their lowest in 2025. Since newer publications have had less time to amass citations, recency bias may be at play here rather than a decline in the caliber or applicability of the research. Furthermore, the sharp increase in publications after 2020 might have distributed citation counts over a larger range.

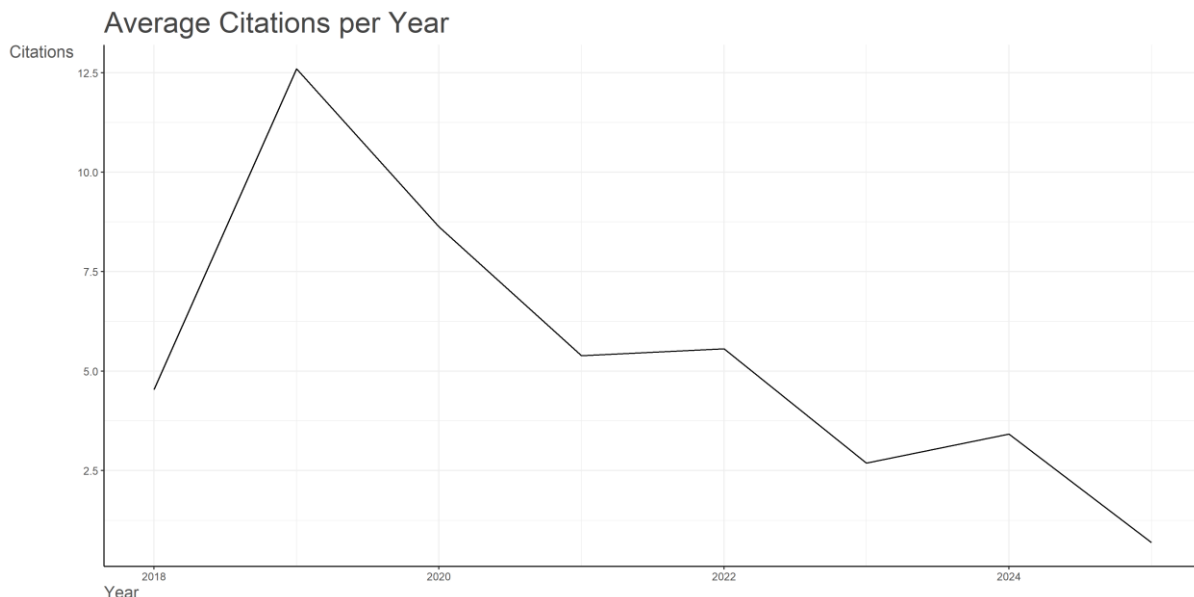


Figure 3 Average Citations per Year for Articles on Blockchain and Stock Market Prediction.

### 3.1.4. Most Relevant Sources Publishing on Blockchain and Stock Market Prediction

Figure 4 lists the leading journals with the most articles on blockchain applications for stock market forecasting. IEEE Access is a prominent platform for interdisciplinary research that integrates computer science, engineering, and financial analytics, as evidenced by its 13 publications. A growing contribution from quantitative modeling and complex systems perspectives is suggested by other notable sources such as Physica A: Statistical Mechanics and Its Applications (7 articles) and Computational Economics (8 articles). Furthermore, the growing interest of financial scholars in blockchain-driven prediction models is evidenced by the six publications published by finance-focused journals like Financial Innovation, International Review of Financial Analysis, and the Journal of Risk and Financial Management. Journals such as Finance Research Letters, Expert Systems with Applications, and Applied Soft Computing also highlight the technology.

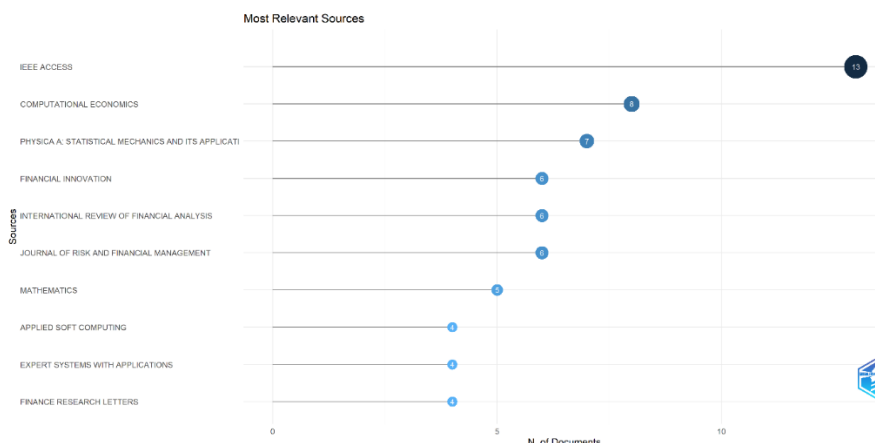


Figure 4 Most Relevant Sources Publishing on Blockchain and Stock Market Prediction.

### 3.1.5. Sources' Production Over Time in Blockchain and Stock Market Prediction Literature

The cumulative scientific output of major journals that published studies on blockchain applications in stock market prediction between 2018 and 2025 is shown in Figure 5. Six well-known journals' publication growth trajectories are highlighted in the plot, providing insight into their established or developing roles in the field. With a sharp increase in publications starting in 2021 and reaching a peak by 2024, IEEE Access exhibits the most notable growth, solidifying its position as a leading multidisciplinary platform for emerging technologies. The consistent output from previous years shows that Physica A: Statistical Mechanics and Its Applications and Journal of Risk and Financial Management played a fundamental role in forming



the early scholarly discourse in the field. The growth of computational economics and financial innovation has accelerated recently, especially after 2022, which is indicative of a greater integration of fintech ideas and computational modeling in financial prediction research.

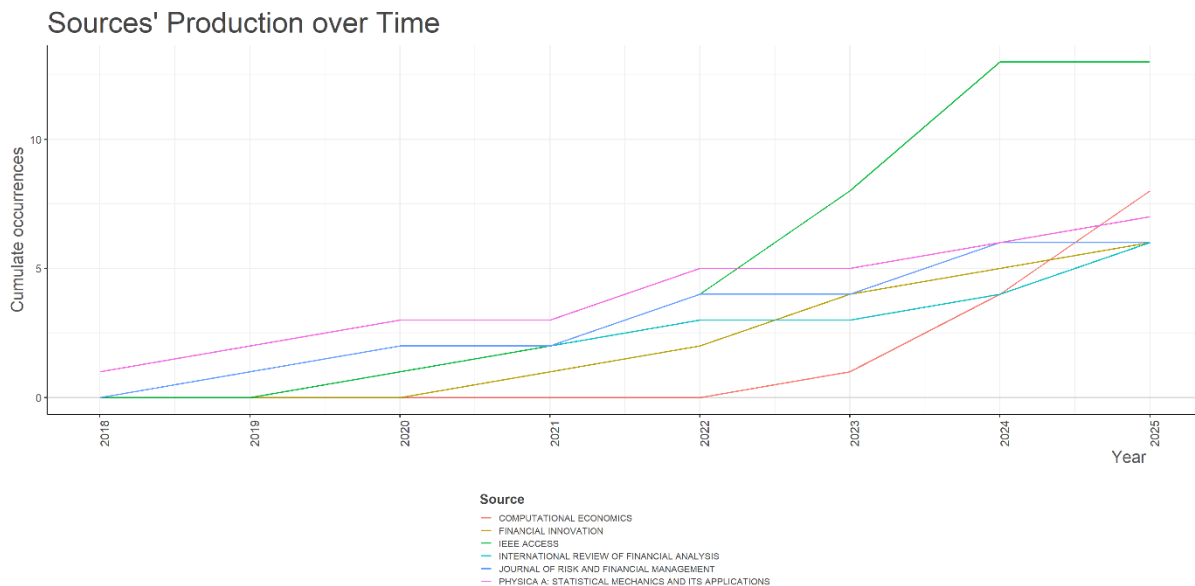


Figure 5 Sources' Production Over Time in Blockchain and Stock Market Prediction.

### 3.1.6. Most Relevant Authors in Blockchain and Stock Market Prediction

Based on the quantity of articles published between 2018 and 2025, Figure 6 lists the most prolific writers in the field of blockchain applications in stock market prediction. With five publications each, the top three contributors—Liveris IE, Pintelas P, and Stavroyiannis S—showed a strong and ongoing interest in the field of study. These academics are probably key players influencing the scholarly conversation at the nexus of computational finance, blockchain technology, and predictive analytics. Zhang Y has the most publications with four, followed by a group of authors with three each: Ashraf I, Li L, Pintelas E, Sharma G, Wang J, and Wang Q. Certain surnames, like Pintelas and Wang, are frequently found together, which could indicate institutional clustering in research output or collaborative authorship. Although a small number of researchers regularly publish in this specialized field, the author productivity pattern shows that the field is still very dispersed.

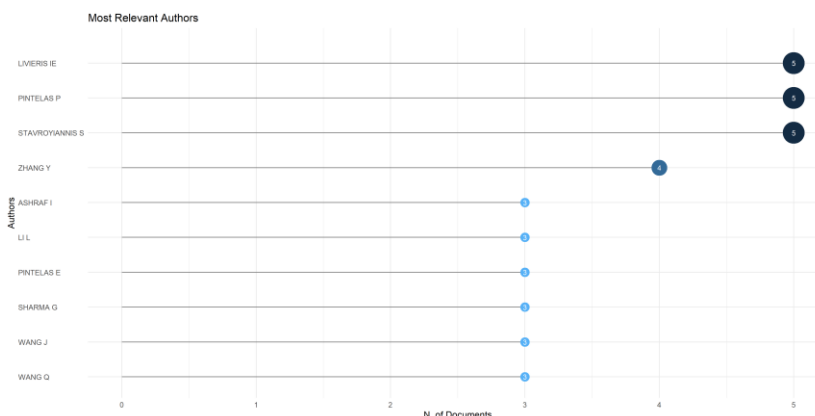


Figure 6 Most Relevant Authors in Blockchain and Stock Market Prediction.

### 3.1.7. Most Cited Articles on Blockchain and Stock Market Prediction

Table 2 provides a summary of the most important papers in the field, highlighting high-impact research that has greatly influenced financial forecasting and blockchain research. Altan and colleagues' most cited paper. (2019), which was published in Chaos, Solitons and Fractals, has a TC/year of 45.86, indicating its continued relevance over time, and 321 citations, demonstrating strong academic engagement. With 276 citations and the highest TC/year value of 46.00, Kraaijeveld (2020) in the Journal of International Financial Markets, Institutions, and Money comes in second, indicating an immediate and significant impact. Yao et al. papers. (2019) Valencia et al. and IEEE Transactions on Industrial Informatics. With more than 190 citations apiece, (2019) in Entropy also show significant impact, combining deep learning and blockchain in predictive modeling





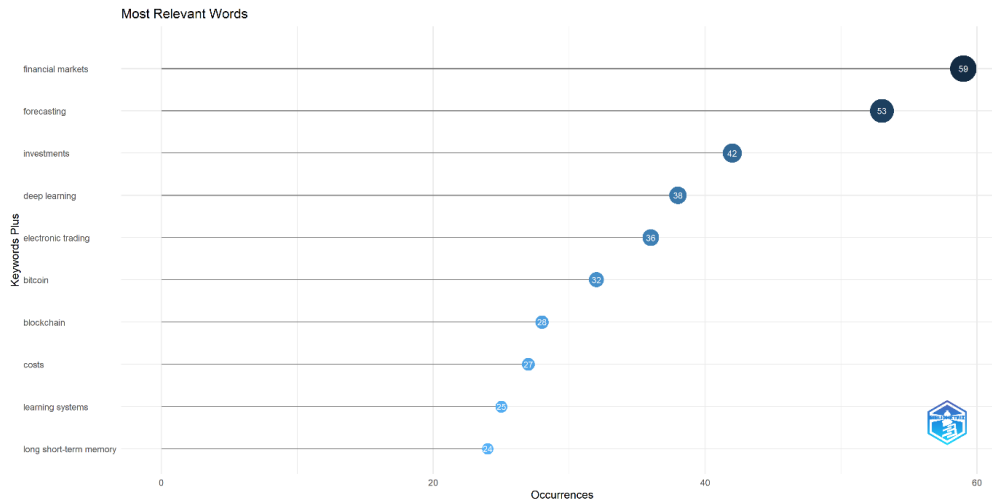


Figure 8 Most Relevant Keywords Plus in Blockchain and Stock Market Prediction Literature.

3.1.10. Treemap of Most Frequently Occurring Keywords in the Literature

The most common keywords in the literature about blockchain and stock market prediction are shown in a treemap visualisation in Figure 9. The field's thematic focus is shown by the size and proportion of each block, which match the frequency of keyword usage. "Financial markets" (59 occurrences), "forecasting" (53), and "investments" (42), the most prevalent keywords, support the research domain's primary focus on financial decision-making and predictive modelling. The crucial importance of artificial intelligence (AI) and algorithmic trading platforms in stock price forecasting is highlighted by the close succession of these terms, "deep learning" (38) and "electronic trading" (36). Words like "blockchain" (28), "bitcoin" (32), and "cryptocurrency" (21) imply a heavy focus on digital asset analysis and decentralised technologies, which are progressively impacting financial market predictive analytics. Other terms like "learning systems," "long short-term memory," and "machine learning" show that data-driven approaches have a significant influence on the area. The attempts to integrate behavioural and unstructured data into prediction frameworks are reflected in the emergence of terms like "sentiment analysis," "data mining," "volatility," and "performance." This varied term structure, which combines blockchain technology, artificial intelligence, data science, and finance, validates the interdisciplinary nature of the research landscape.

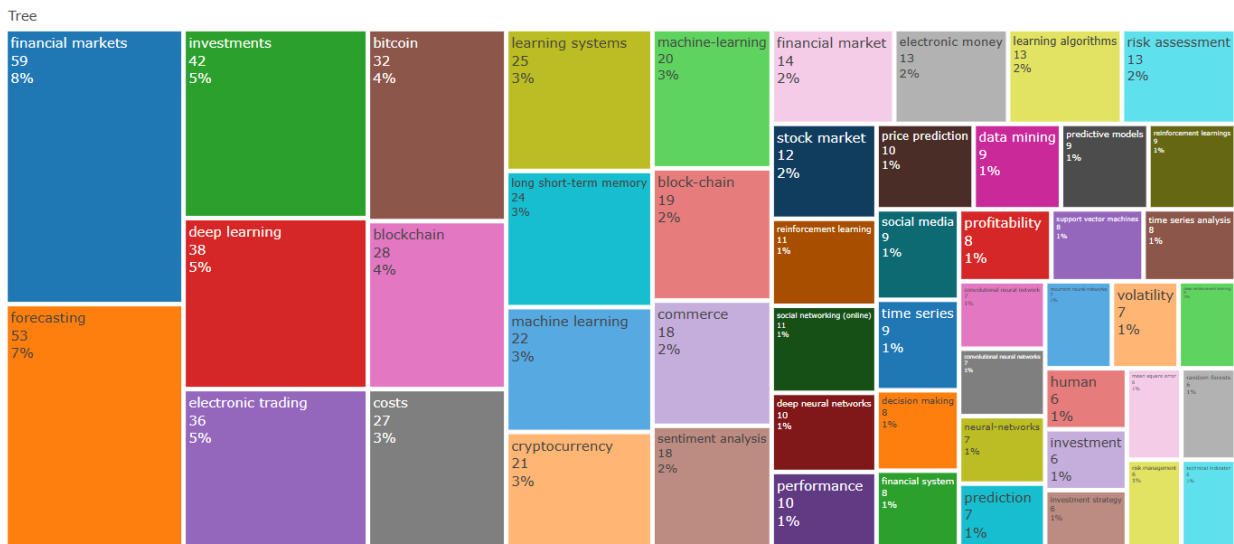


Figure 9 Treemap of Most Frequently Occurring Keywords in the Literature.

3.1.11. Trend Topics in Blockchain and Stock Market Prediction Research

The evolution of popular research terms from 2020 to 2025 is depicted in Figure 10, which shows how the stock market forecast and blockchain thematic landscape has changed over time. The term's frequency is indicated by the size of the bubbles, and its emergence or ongoing existence in the literature is shown by its position along the timeline. The first stage of incorporating blockchain technology into financial prediction models was reflected in the emergence of key foundational topics



including "blockchain," "cryptocurrency," "electronic trading," and "predictive analytics" early in the timeframe (2020–2021). More technological developments in the subject were made possible by these terms. The significant and steady presence of phrases like "deep learning," "investments," "forecasting," and "financial markets" between 2022 and 2024, on the other hand, suggests that they play a key part in the contemporary literature. A growing interest in fusing behavioural analytics and unstructured data with predictive models is shown by the recurrence of the terms "machine learning," "sentiment analysis," and "social networking (online)" in 2023–2024. Notably, "trading strategies," "prediction models," and "decentralised finance" are developing trends in 2025 that could be next-generation issues in this field of study. They appear to be developing frontiers ready for growth and scholarly investigation based on their late yet focused emergence. From blockchain infrastructure and cryptocurrency foundations to more sophisticated, intelligent, and finance-focused applications — culminating in themes like DeFi and algorithmic trading methods that are ready for the future — our analysis validates a temporal thematic shift.

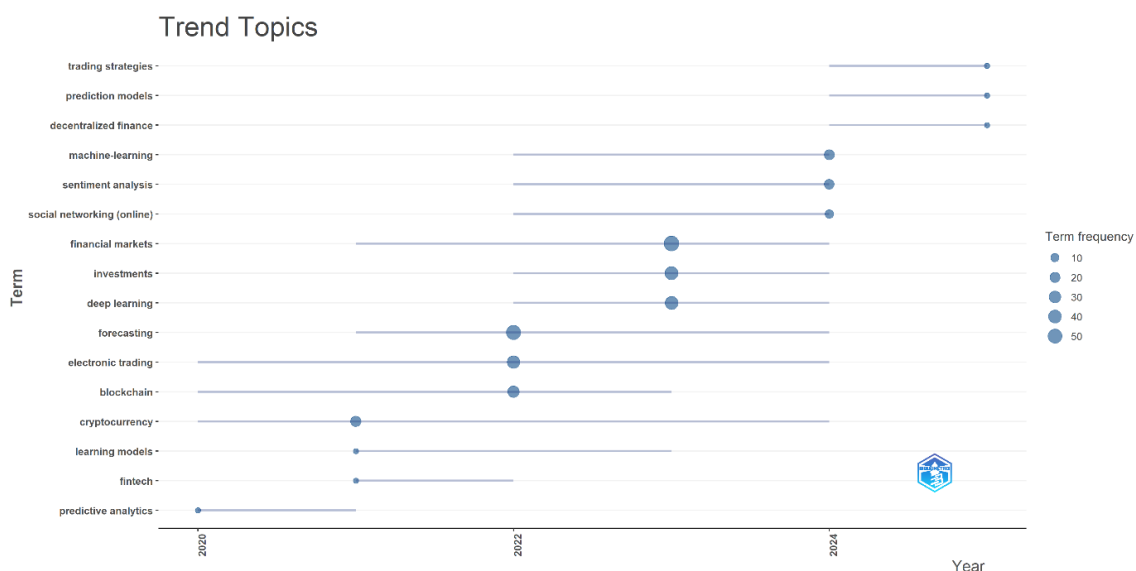


Figure 10 Trend Topics in Blockchain and Stock Market Prediction Research.

### 3.1.12. Thematic Map of the Literature

The theme map produced by the co-word analysis of the literature on blockchain and stock market prediction is shown in Figure 11. Four quadrants make up this two-dimensional plot:

**Top Right: Motor Themes (High Centrality & High Density)** Themes including "financial markets," "forecasting," "investments," and "prediction" are included in this quadrant. These constitute the intellectual centre of the field of study and are highly developed and interconnected. They serve as the foundation of the literature, demonstrating methodological maturity and ongoing scientific interest. Furthermore, "financial system," "investment strategy," and "reinforcement learning" also show up close to the edge of the motor quadrant, suggesting their increasing significance in algorithmic trading and prediction applications.

**Bottom Right: Basic Themes (High Centrality, Low Density)** Although they are less internally developed, themes like "machine learning," "cryptocurrency," and "sentiment analysis" are essential to the discipline. The conceptual depth of these issues is still developing, despite the fact that they are fundamental, frequently discussed, and occur in numerous works. They are important starting points for more extensive conversations on forecasting facilitated by blockchain.

**Top Left: Niche Themes (High Density, Low Centrality)** The highly developed but comparatively isolated terms "climate change," "energy," and "digital storage" are found in this quadrant. Their existence points to a growing interest in using blockchain technology and forecasting models outside of the financial markets, perhaps in the direction of green technologies or sustainable finance. They still have little bearing on popular fiction, nevertheless.

**Bottom Left: Emerging or Declining Themes (Low Centrality & Density)** This quadrant includes topics such as "capital market," "forecasting models," "forecasting performance," and "crime." These can have a limited scope, be understudied, or even be losing their scholarly significance. But with more study, some might become more important issues.

### 3.1.13. International Country Collaboration Map in Blockchain-Based Stock Price Prediction Research

The global network of scientific collaborations based on co-authorship between nations is depicted in Figure 12. The map connects active nations with lines signifying international cooperation and highlights them in deeper blue tones. Countries with High Contributions.

The nations with the darkest hues—China, India, and the United States—reflect their dominance in terms of publication volume and cooperative efforts. These countries' technological prowess, extensive academic networks, and investments in



blockchain and financial innovation make them important research hubs. The fundamental triangle of international cooperation is made up of China, India, and the United States. These countries have strong regional ties to European countries like Germany, Italy, and the United Kingdom. Although they have fewer connections, Australia, South Korea, and a number of Middle Eastern nations also show up as secondary hubs of intellectual interchange. Moderately cooperative European countries like France, Spain, and Greece frequently connect with their counterparts in Asia and North America.

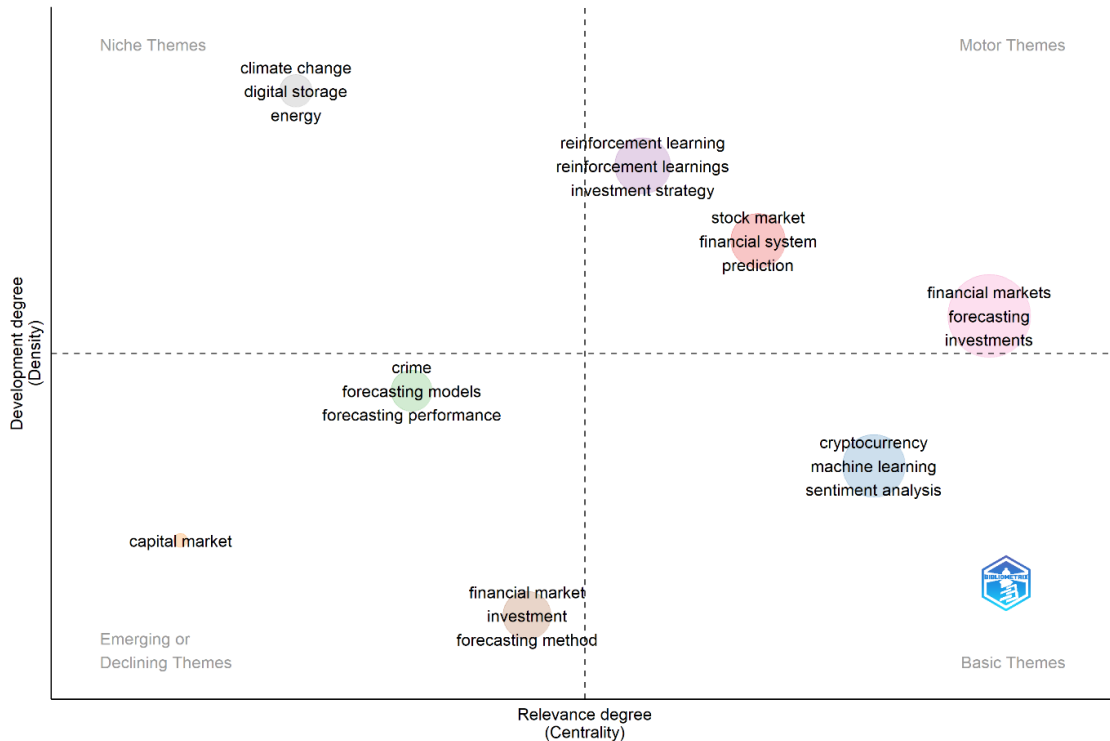


Figure 11 Thematic Map of the Literature.

Developing Involvement The pale shading of Latin American, Southeast Asian, and certain African nations suggests a lack of research production or a lack of global integration in this area. Their existence does, however, suggest the possibility of more academic involvement and development.

### Country Collaboration Map

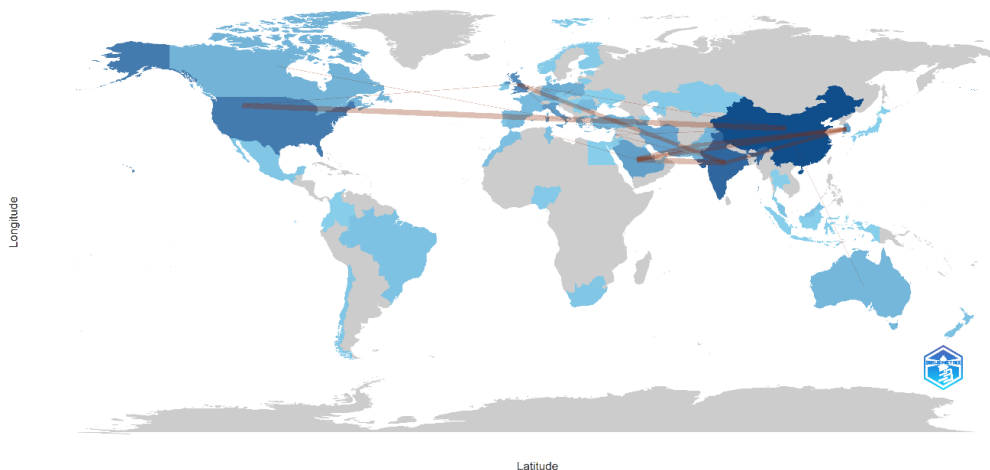


Figure 12 International Country Collaboration Map in Blockchain-Based Stock Price Prediction Research.

## 3.2. Bibliometric Mapping and Analysis Using VOS-Viewer

### 3.2.1 Keyword Co-occurrence Network Map of Research on Blockchain and Stock Price Prediction

An illustration of the intellectual framework of research in the nexus of blockchain technology, machine learning, and financial forecasting may be found in the keyword co-occurrence network map (Figure 13). The network uses phrases that



occur frequently to identify a number of different theme groupings. Terms like "bitcoin," "blockchain," "deep learning," "neural networks," and "risk management" are at the centre of the red cluster, indicating a strong focus on applying cutting-edge neural network architectures like LSTM and GRU to cryptocurrency markets, especially for risk-aware price prediction. Keywords like "machine learning," "cryptocurrency," "stock market," and "sentiment analysis" are included in the green cluster, indicating research aimed at combining machine learning methods with technical and behavioural indicators to improve predictive performance in trading and investment contexts. Terms like "reinforcement learning," "investment strategy," and "financial data processing" are used to describe the blue cluster, which emphasises the growing interest in autonomous, adaptive learning techniques for dynamic financial decision-making. Broader ideas like "forecasting," "financial markets," and "artificial intelligence" are grouped together in the purple cluster, suggesting a fundamental domain that links the more specialised groupings. Last but not least, the yellow cluster reflects ongoing interest in traditional methods of financial forecasting by include statistical and machine learning terms like "data mining," "predictive models," "random forest," and "time series analysis." A high degree of interdisciplinarity is suggested by the dense connections between clusters, with new synergies between financial analytics, AI methods, and fintech innovation.

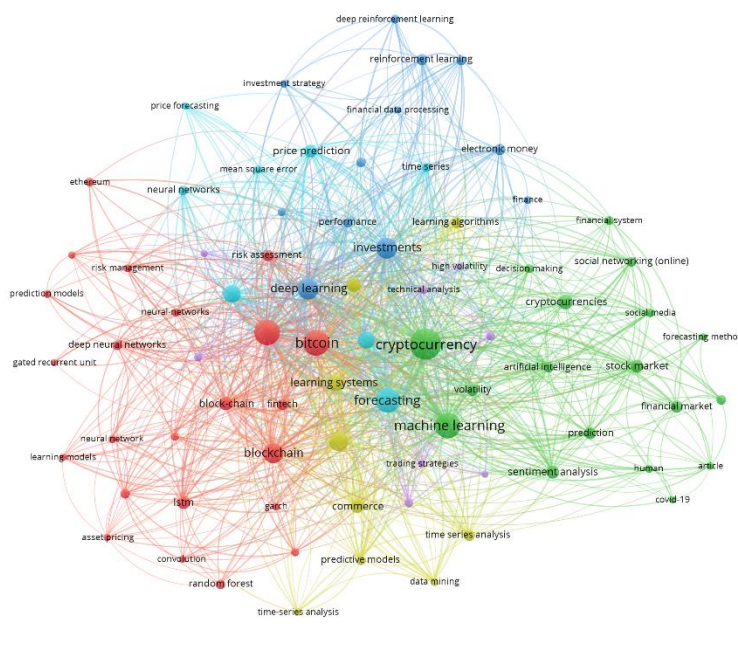


Figure 13 Keyword Co-occurrence Network Map of Research on Blockchain and Stock Price Prediction.

#### 4. Discussion

The evolving academic landscape at the intersection of blockchain technology, machine learning, and stock price prediction demonstrates a significant trend in scientific production, particularly since 2018. The publication rate has been on a steady upward trajectory, with a pronounced increase noted from 2020 onward, aligning closely with the global acceleration of fintech innovations and the widespread adoption of decentralized finance (DeFi) systems. This surge in research output reflects a heightened scholarly interest in blockchain's integration with AI-based predictive models used in financial forecasting and algorithmic trading (Singh, 2024). The rise of decentralized finance (DeFi) has particularly transformed traditional financial systems, showcasing blockchain's potential to disrupt and enhance standard practices. Applications in DeFi, powered by Ethereum and other blockchain platforms, are recognized for promoting inclusivity, transparency, and efficiency in financial transactions, thus creating new possibilities in financial modeling and analytics (Luo, 2021). Studies indicate that the implementation of machine learning techniques, such as recurrent neural networks and long short-term memory networks, is becoming increasingly prevalent in predicting stock market movements (Liu, 2023). This integration aims not only to improve predictive accuracy but also to capitalize on the unique data structures provided by blockchain environments. The combination of these two domains—blockchain and machine learning—is essential in addressing the complexities of stock price prediction, which entails analyzing intricate relationships among numerous variables that are dynamic and often non-linear. Furthermore, the disclosed bibliometric trends reflect a broader interdisciplinary approach where contributions from fields such as finance, computer science, and economics converge, facilitating a holistic understanding of market dynamics through enhanced data analytics capabilities. Despite advancements in research, the existing literature remains somewhat fragmented, mainly focusing on either blockchain applications in financial services or AI methodologies for stock forecasting. Therefore, a bibliometric analysis serves as a vital tool in consolidating various studies, providing insights into publication trends, influential



authors, and thematic clusters that characterize the integration of these transformative technologies (Liang et al., 2018). As the landscape evolves, there is substantial academic and practical interest in exploring how the synergistic application of blockchain technology and machine learning can enhance stock price prediction capabilities. Continuous research in this field is likely to yield significant breakthroughs that could reshape financial forecasting practices and the implementation of decentralized financial systems.

## 5. Implications

The findings of this bibliometric analysis carry important practical, theoretical, and policy-level implications for researchers, industry practitioners, and regulators operating at the intersection of blockchain technology and financial forecasting. From a practical standpoint, the dominance of themes like forecasting, financial markets, and deep learning suggests that the integration of AI and blockchain is becoming a viable strategy for enhancing predictive accuracy and decision-making in high-frequency trading environments. The growing use of models such as LSTM, reinforcement learning, and sentiment analysis from social media indicates a shift toward hybrid and adaptive systems capable of managing market volatility and unstructured data sources. These insights can aid fintech firms, hedge funds, and retail investors in developing smarter, data-driven trading tools and portfolio strategies. For academic researchers, this study maps a clear trajectory of the field, identifying core authors, impactful publications, and emerging keywords. Scholars can leverage this structured knowledge base to avoid redundancy, identify research gaps (e.g., underexplored links between blockchain protocols and model explainability), and design future studies around evolving trends like decentralized finance (DeFi) and AI interpretability in forecasting. The keyword trend analysis suggests ample scope for exploring comparative model efficiency, risk assessment algorithms, and real-time sentiment tracking in stock prediction models. At the policy level, the international collaboration map emphasizes the need for harmonized global standards on the ethical and transparent use of AI and blockchain in financial systems. Regulators should consider guidelines that balance innovation with investor protection, especially as decentralized platforms blur jurisdictional boundaries. Moreover, the increasing reliance on machine learning for financial predictions calls for frameworks ensuring algorithmic accountability, fairness, and resistance to manipulation. Overall, this study reinforces that blockchain and AI-based forecasting are not only academic concerns but also critical pillars of modern financial infrastructure. Institutions, policymakers, and innovators must work collaboratively to ensure responsible innovation, data integrity, and regulatory oversight in this fast-growing domain.

## 6. Limitations and Future Directions

While this bibliometric analysis presents a comprehensive and structured overview of research on blockchain and stock market prediction, it is not without certain limitations. The analysis is confined to articles indexed in major databases like Scopus and Web of Science, which may have resulted in the exclusion of significant contributions from platforms such as IEEE Xplore, arXiv, SSRN, or non-indexed conference proceedings. Moreover, the reliance on a keyword-based search strategy may have inadvertently omitted relevant studies that use alternative terms like "cryptofinance," "tokenized markets," or "algorithmic trading," thereby narrowing the thematic scope of the review.

The study's temporal window, focusing on literature published between 2018 and 2025, could also skew results by emphasizing newer trends while potentially overlooking foundational research that predates this period. Additionally, while tools such as Biblioshiny and VOSviewer offer robust capabilities for visualizing bibliometric networks, they may fall short in capturing the deeper contextual and interdisciplinary nuances of the field.

Future research can build on these insights by broadening the data sources through the inclusion of multiple databases to improve coverage. Combining quantitative bibliometric techniques with qualitative content analysis may also offer a more nuanced understanding of evolving themes. Furthermore, exploring cutting-edge developments such as explainable AI, quantum-enhanced forecasting, and the role of blockchain in sustainable finance could open new research avenues. Comparative analyses across regions, markets, or asset classes may help reveal localized patterns of adoption. A policy-oriented bibliometric approach could also shed light on how academic research intersects with regulatory frameworks governing blockchain and predictive analytics in financial markets.

## 7. Conclusions

This bibliometric analysis offers a structured and insightful overview of the scholarly developments at the intersection of blockchain technology and stock market prediction. By identifying key contributors, influential publications, and emerging research themes, the study reveals the rapid growth and interdisciplinary nature of this field. The integration of blockchain with advanced technologies such as artificial intelligence and machine learning reflects a broader trend toward innovation in financial analytics and market forecasting. While the analysis provides a valuable foundation for understanding the current research landscape, it also acknowledges certain limitations, including database selection, keyword constraints, and a restricted publication timeframe. These factors may have influenced the thematic breadth and historical depth of the findings. Nonetheless, the results underscore a vibrant and evolving domain with significant implications for both academia and practice.

Future research would benefit from adopting more inclusive data sources, exploring underrepresented topics such as explainable AI and sustainable finance applications, and examining regional and regulatory variations in technology adoption. This study aims to serve as a reference point for researchers, practitioners, and policymakers interested in the transformative potential of blockchain within the context of financial prediction and market intelligence.

### Ethical considerations

Not applicable.

### Conflict of Interest

The authors declare no conflicts of interest.

### Funding

This research did not receive any financial support.

### References

- Abdullah, S., Rothenberg, S., Siegel, E., & Kim, W. (2020). School of Block—Review of Blockchain for the Radiologists. *Academic Radiology*, 27(1), 47–57. <https://doi.org/10.1016/j.acra.2019.06.025>
- Agarwal, N., Wongthongtham, P., Khairwal, N., & Coutinho, K. (2023). Blockchain Application to Financial Market Clearing and Settlement Systems. *Journal of Risk and Financial Management*, 16(10), 452. <https://doi.org/10.3390/jrfm16100452>
- Arshi, A., & Padma N, M. J. (2022). A Hybrid Machine Learning Technique for Stork Market Prices Prediction. *INTERANTIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT*, 06(03). <https://doi.org/10.55041/IJSREM12065>
- Bauvars, J. (2021). Applicability of Blockchain Technology in Securities Settlement. *Complex Systems Informatics and Modeling Quarterly*, 28, 34–58. <https://doi.org/10.7250/csimq.2021-28.03>
- Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2024). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: an empirical investigation. *Annals of Operations Research*, 333(2–3), 627–652. <https://doi.org/10.1007/s10479-021-03956-x>
- Han, S., Ulhøi, J. P., & Song, H. (2024). Digital trust in supply chain finance: the role of innovative fintech service provision. *Journal of Enterprise Information Management*, 37(6), 1737–1762. <https://doi.org/10.1108/JEIM-07-2022-0238>
- Kazachenok, O. P., Stankevich, G. V., Chubaeva, N. N., & Tyurina, Y. G. (2023). Economic and legal approaches to the humanization of FinTech in the economy of artificial intelligence through the integration of blockchain into ESG Finance. *Humanities and Social Sciences Communications*, 10(1), 167. <https://doi.org/10.1057/s41599-023-01652-8>
- Kim, J.-S., Shin, J.-M., Choi, S.-H., & Choi, Y.-H. (2022). A Study on Prevention and Automatic Recovery of Blockchain Networks Against Persistent Censorship Attacks. *IEEE Access*, 10, 110770–110784. <https://doi.org/10.1109/ACCESS.2022.3214213>
- Liu, Z. (2023). Stock Price Prediction Based on Daily News Headlines: Logistic Regression Model and LSTM Model. *Advances in Economics, Management and Political Sciences*, 45(1), 121–129. <https://doi.org/10.54254/2754-1169/45/20230271>
- Lo, Y., & Medda, F. (2020). Uniswap and the Rise of the Decentralized Exchange. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3715398>
- Luo, S. (2021). (2021). Review on the Application of Machine Learning in Stock Forecasting. *Academic Journal of Business & Management*, 3(4). <https://doi.org/10.25236/AJBM.2021.030407>
- Pal, A., Tiwari, C. K., & Behl, A. (2021). Blockchain technology in financial services: a comprehensive review of the literature. *Journal of Global Operations and Strategic Sourcing*, 14(1), 61–80. <https://doi.org/10.1108/JGOSS-07-2020-0039>
- Singh, S. (2024). Decentralized Finance (DeFi): Exploring the Role of Blockchain and Cryptocurrency in Financial Ecosystems. *International Research Journal of Modernization in Engineering Technology and Science*. <https://doi.org/10.56726/IRJMETS48585>
- Subagio, H., & Sitepu, R. (2023). Reading Big Data by Machine Learning: The Used of Computer Science for Human Life. *Jurnal Penelitian Pendidikan IPA*, 9(10), 8588–8593. <https://doi.org/10.29303/jppipa.v9i10.4752>
- Wang, X. (2023). Algorithms and Research in Accounting Application Based on Artificial Intelligence. *Proceedings of the 2nd International Conference on Financial Innovation, FinTech and Information Technology, FFIT 2023, July 7–9, 2023, Chongqing, China*. <https://doi.org/10.4108/eai.7-7-2023.2338051>