



Blockchain-Based Financial Technology and Scientometric Analysis

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Abstract. In the era of the Internet where profitability reigns supreme, cryptocurrencies like Bitcoin have surged in popularity, sparking a profound interest in the foundational technology of blockchain. This article delves into the intricate relationship between blockchain and financial technology (fintech), exploring how their synergy has evolved and the impact they wield across diverse industries. To accomplish this objective, a meticulous examination of 343 pertinent papers from the Web of Science (WoS) repository was undertaken. Leveraging tools such as VOSviewer and bibliometrix, we visually represent the integration and central themes within the literature. Our analysis reveals that blockchain has emerged as a dominant force in the fintech realm, yet its widespread adoption encounters hurdles. Overcoming these obstacles is imperative to meet the evolving needs of society. By illuminating the current landscape of blockchain and fintech, our research aspires to equip scholars with a comprehensive understanding to pinpoint key areas for future exploration and meaningful contributions to the domain.

Keywords: blockchain, financial technology, Bitcoin

1 Introduction

Blockchain offers significant benefits for FinTech, including enhanced data privacy, traceability, trust, security, efficiency, and cost reduction. Its implementation is crucial for the financial services industry[1]. FinTech and blockchain are transforming financial services[2]. Blockchain technology can effectively mitigate bank risk associated with government implicit debt risk. Policymakers can leverage fintech to strengthen government debt governance and promote financial stability[3]. Blockchain applications in FinTech are gaining significant research attention. However, the focus remains primarily on the finance and banking sector, overlooking other potential applications across various industries[4]. Significant research gaps exist in Finance regarding blockchain. Similar to crowdfunding, blockchain also leads to the emergence of new intermediaries. The trust element inherent in blockchain enables it to eliminate the need for

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intermediaries in some financial areas, but not all. [5] Researchers are developing new blockchain technologies that are better suited for FinTech applications, addressing issues like transaction speed, security, and privacy[6]. FinTech has a dominant influence, especially in the short-term, over the DeFi and NFT markets that are based on blockchain[7]. The 141 articles in the supply chain industry were analyzed on Bitcoin, Blockchain, and Fintech, revealing their growing adoption for competitive advantage[8]. Blockchain technology offers a promising solution for the financial inclusion of the unbanked population in developing countries[9]. Blockchain is also considered for international trade, taxation, supply chain management, business operations, and governance. Blockchain can unlock the full potential of the Fourth Industrial Revolution[10]. Blockchain technology holds the potential to disrupt traditional corporate governance practices and improve transparency, accountability, and security[11]. While blockchain and cryptocurrencies offer innovative solutions, consumer adoption remains low. Building trust through government regulation, user-friendly design, and educational initiatives is key to unlocking their full potential.[12] Digitalization, blockchain, and FinTech adoption are key drivers of sustainable performance for financial institutions. Embracing digital transformation, adopting blockchain technology, and fostering a positive FinTech attitude can lead to significant environmental, social, and economic benefits[13].

This literature analysis highlights the interconnectedness of blockchain and financial technology, emphasizing the importance of further research in this area for researchers and policymakers. The article successfully addresses this knowledge gap.

2 Data and Methods

To gather information related to fintech and blockchain, we used the following Web of Science (WoS) advanced search query:

TS=(“Blockchain”) and TS=(“Fintech” or “financial technology”)

A total of 343 articles (including EI, SSCI, etc.) were collected on March 29, 2024.

WoS is the world's largest comprehensive academic information resource covering most disciplines, the Impact Factor (IF) launched by WoS has now become a common international journal evaluation index. The cumulative impact of these 343 papers is substantial, with a total citation frequency of 6726 times, averaging 19.61 citations per paper and achieving an h-index of 40.

For exploratory analysis, we developed the mapping using VOSviewer and Bibliometrix.

3 Research Findings

3.1 Three-Domain Graph

The three-domain graph can comprehensively analyze the relationship between different bibliometric indicators and construct the network graph of the comprehensive network among indicators. As shown in Figure 1, "AU_CO" represents the country where

the author is located, "AU" represents the author, and "DE" represents the keyword, and the graph shows the correlation between these three. As can be seen from the figure, China, the United States, Pakistan, Jordan, and Malaysia have higher research contributions in this field. Most of the keywords displayed on the right are around topics such as "fintech," "blockchain," "security," "crowdfunding," and "Bitcoin."

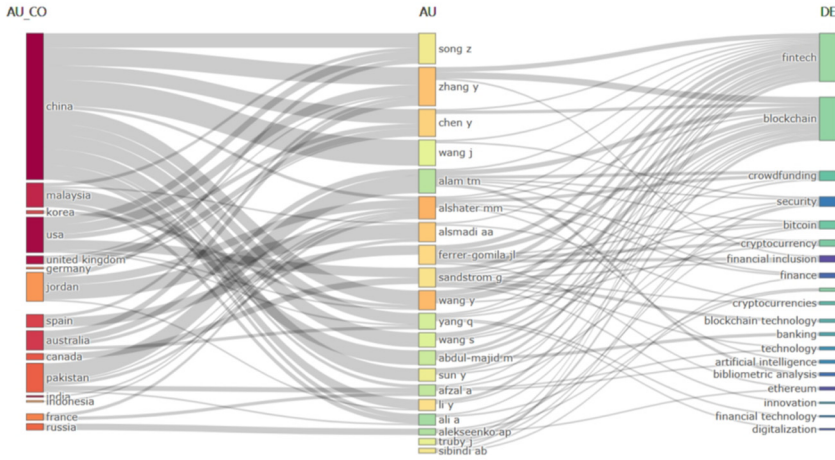


Fig. 1. Three domain graph

3.2 Co-occurrence of Author Keywords

Figure 2 displays the 36-keyword cooperation network produced by Vosviewer. By establishing a specific threshold, the co-agency network of keywords can indicate the relationships among them. The figure comprises four sets of concepts. The initial concept cluster pertains to "Fintech" and "blockchain," underscoring the significance of financial technology and blockchain in economic progress, along with their connections to cryptocurrencies, trust, models, and Bitcoin.

The second concept cluster focuses on green "scientific intelligence", encompassing technology, management, and security. Intelligent technology systems play a crucial role in enriching knowledge and are increasingly prevalent in human life. The integration of technology, management, security, and supply chain with smart contracts is key to enhancing economic benefits through the Internet. The third group, centered around red "financial innovation", includes financial technology, regtech, artificial intelligence, information, financial inclusiveness, and banking. These components form a dynamic system that interacts and influences sustainable development. The fourth yellow group consists of adoption, impact, and disruption keywords. Despite having less content, it highlights the influence of reference and process interruption on financial technology, blockchain, and related industries.

3.3 Main Theme

Figure 3 is a strategic coordinate plot where density represents the vertical axis and centrality represents the horizontal axis. Centrality is the degree of correlation between different topics; Density measures the cohesion between nodes. In the figure, the three themes of "Fintech", "blockchain" and "cryptocurrency" have the greatest centrality and highest relevance, and are important to this field, but are not well developed; "Startup finance", "ICOS", "token offerings" have the highest density and cohesion, are very important for the field and have been well developed. Therefore, we need to focus on the development of blockchain and fintech, as well as the development of cryptocurrencies.

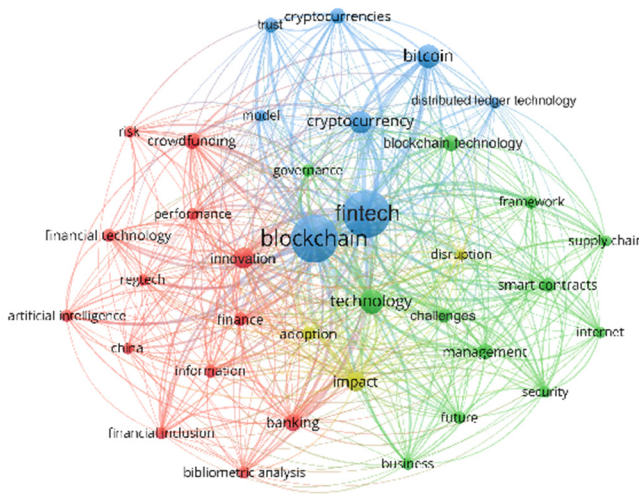


Fig. 2. Co-occurrence of author keywords

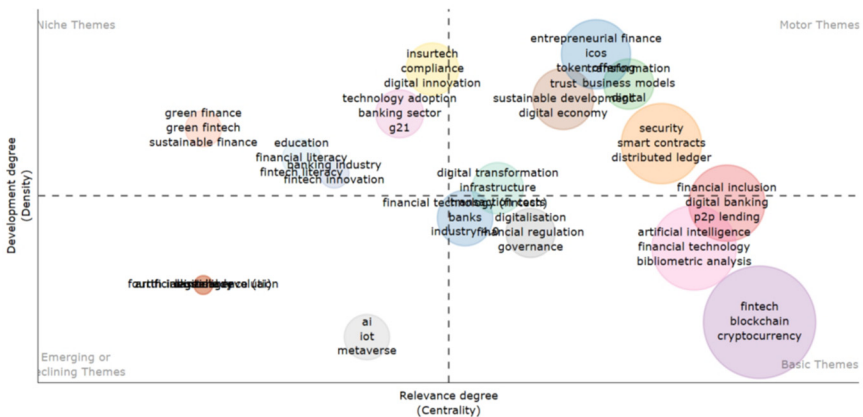


Fig. 3. Strategic coordinates

3.4 Factor Analysis

The data structure graph is derived through keyword retrieval and factor analysis, with its significance determined by the cluster graph's size. In Figure 4, the red cluster appears notably large, with a Dim value close to the origin, indicating a central position, followed by the blue cluster. Keywords closely associated with these clusters include cryptocurrencies, shocks, volatility, models, blockchain technology, innovation, future, banking, business opportunities, management, highlighting cryptocurrencies and shocks. Other terms like services, trust, information technology, intent, investment, transformation, and Internet, exhibit a deviation in their relationship to the main keywords, positioned towards the chart's periphery.

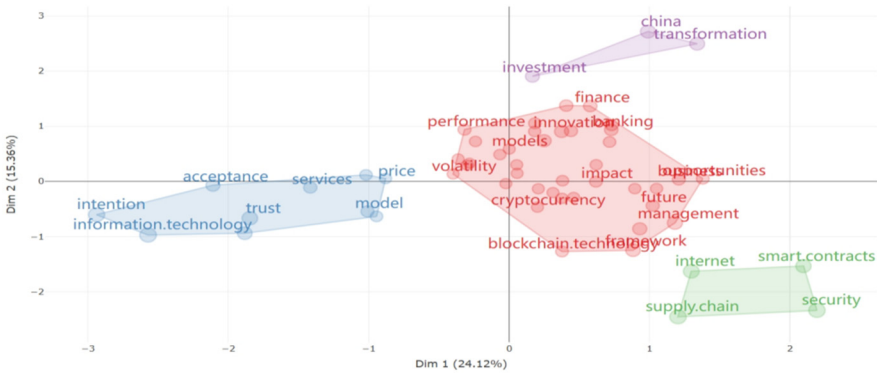


Fig. 4. Conceptual diagram of structure

4 Conclusion

Blockchain technology, as an innovative force in the field of financial technology, has profoundly changed the financial landscape with its decentralized, transparent and immutable characteristics. It improves transaction security, credibility, reduces transaction costs, makes financial transactions more transparent and traceable, and reduces fraud. Smart contracts make contract execution more efficient, reduce human risk, and increase transaction speed and accuracy. At the same time, blockchain facilitates cross-border payments and clearing, accelerating international trade and capital flows. More importantly, it offers a new path to financial inclusion and greater access to financial services. Blockchain technology will continue to lead the innovative development of fintech.

The paper summarizes the complex relationship between blockchain and fintech and its application in different industries. Through in-depth analysis of relevant papers, it is found that although blockchain dominates the field of financial technology, there are still obstacles to promotion. The paper highlights the importance of further research in this area, noting that digitization, blockchain, and fintech adoption are key drivers of sustainable performance for financial institutions.

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