



Scientometric Analysis of Digital Currencies in Financial Technology Innovation

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Abstract. Driven by the deep integration of blockchain technology and the digital economy, financial technology innovation and digital currency research have evolved into a core interdisciplinary field. Based on scientometrics, this study screens out 80 high-impact papers from the Web of Science Core Collection between 1975 and 2024. The data of this paper will be visualized through VOSviewer and Bibliometrix software. The research shows that financial technology innovation and digital currency can be divided into four clusters: digital currency, fintech, etc. China and the United States have demonstrated significant academic dominance in the field of fintech and digital currency. Meanwhile, the analysis of the transnational cooperation network further reveals that China has close cooperation with countries such as India and Australia. The heat of financial technology innovation has increased, and the discussion on the security of digital currency has also intensified.

Keywords: Fintech innovation, digital currency, scientometric analysis

1 Introduction

Financial technology (Fintech) breakthroughs, from the early days of coins and paper money to card payments, e-money, mobile payments, and more recently cryptocurrencies, have heralded a transformation of the financial and monetary system [1]. Fintech uses software, apps, and digital platforms to deliver financial services to consumers and businesses through digital devices such as smartphones, and has emerged as a recognized promising tool for promoting financial inclusion [2]. It is important for the structure of cryptocurrencies and the impact of blockchain technology, privacy, secure management of data and information, and the development of optimal information systems [3]. The popularity of blockchain technology and cryptocurrencies has generated great interest in the narrative surrounding digital cash and online payments [4]. As key financial sectors adapt to the expansion of remote operations, vulnerability to cybersecurity threats may increase, posing a potential threat to the financial system [5] [6]. Cryptocurrencies pose financial stability risks that can be mitigated through effective regulation [7] [8].

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2 Data and methodology

This study leverages the Web of Science (WoS) core collection to conduct a systematic literature analysis of research intersecting digital currency and FinTech. Employing the composite search formula "TS=(digital currency) AND TS=(FinTech OR financial technology)" across the period 1975-2024, and adhering to the exact matching principle, a total of 80 relevant articles were identified on November 24, 2024. The subsequent analysis utilized Bibliometrix 3.0 and VOSviewer to explore key aspects of this body of work. Preliminary findings reveal a total of 1,159 citations across these 80 publications, yielding an average of 14.49 citations per article. Furthermore, the h-index for this collection is 17, indicating a moderate but significant impact within the academic community.

3 Research Results

This paper presents a map based on the corresponding author's countries, as well as the co-occurrence network of all keywords, and the graph based on literature coupling cluster analysis.

3.1 Analysis of the author's relations with the country

Figure 1 reveals a landscape of global scholarly activity in digital currency and fintech innovation characterized by uneven distribution and varying national emphases. China and the United States dominate the field, exhibiting the highest concentration of researchers. China's robust performance in both Single Country Publications (SCP) and Multiple Country Publications (MCP) signifies a comprehensive research agenda. The United States, while excelling in SCP, also maintains a notable MCP output, reflecting its scientific prowess and diverse exploration of the subject. India's focus, as evidenced by its significantly higher SCP compared to MCP, underscores a narrower but active research priority within the field.

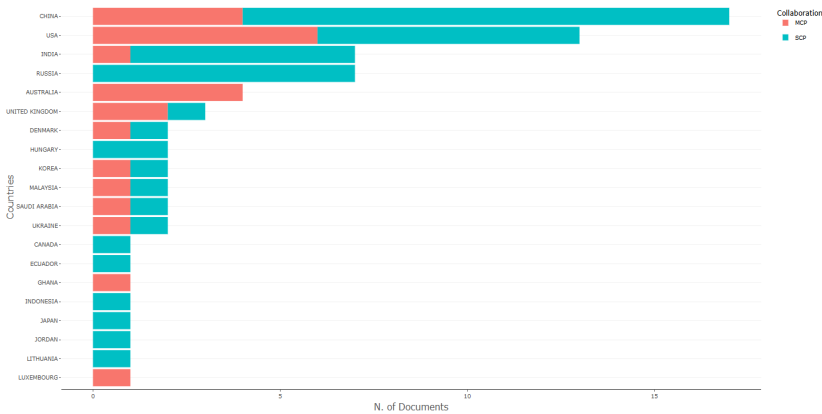


Fig. 1. Map based on corresponding author's countries

3.2 Mapping based on the co-occurrence network of all keywords

Figure 2 presents a co-occurrence network of 35 author keywords, revealing distinct clusters indicative of prevailing research themes. The red cluster, characterized by terms like "fintech," "digital currency," and "bitcoin," highlights the concentration of research on financial technology, its digital currency applications, and cryptocurrency development, emphasizing the potential for multi-faceted technical collaboration and innovation. The green cluster, centered on "blockchain," "bitcoin," "digital currency," and "cryptocurrency," clearly focuses on the exploration of blockchain technology and its implications for monetary systems.

The blue cluster, denoted by "financial trust," connects keywords such as "acceptance," "online transactions," and "risk," signifying the crucial link between fintech and public trust. This suggests underlying concerns regarding the integration of fintech with blockchain and cryptocurrencies, underscoring the necessity of addressing financial transaction security. Finally, the yellow cluster, revolving around "banking and finance," links with "financial information" and "intelligent privacy," pointing to the challenges and security considerations inherent in the application of artificial intelligence within the financial sector.

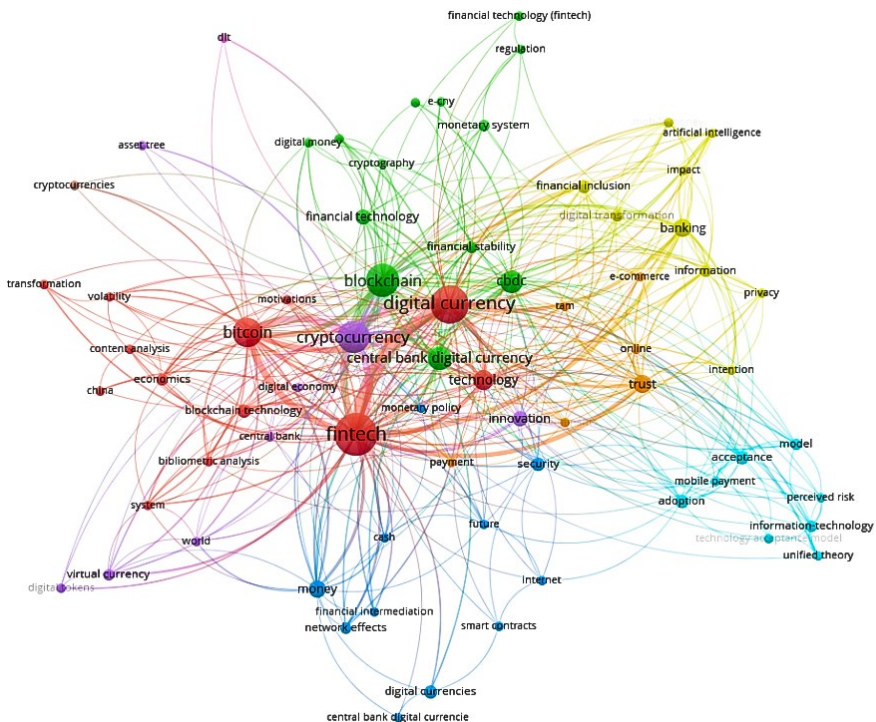


Fig. 2. Map of the co-occurrence network of all keywords

3.3 Three-field plot graph based on literature coupling

Figure 3 constructs a multi-dimensional association network around the theme of financial innovation, vividly demonstrating the intrinsic connection between financial innovation and the development of digital currencies. The "keywords plus" column on the left (such as intention, banking, blockchain, etc.) reveals the core concepts of the research focus; the "countries" section in the middle (including China, the United States, India, etc.) reflects the participation degree of major countries around the world in the field of financial innovation; the "titles" column on the right (such as digital, currency, cryptocurrency, etc.) clarifies the research theme direction. The crisscrossing connection lines in the figure intuitively present the complex interrelationships among the three, not only reflecting the research emphasis of different countries in various fields of financial innovation, but also revealing the interactive relationship among technology, policy and market practice in the global digital currency development pattern, providing researchers with a systematic analytical framework.

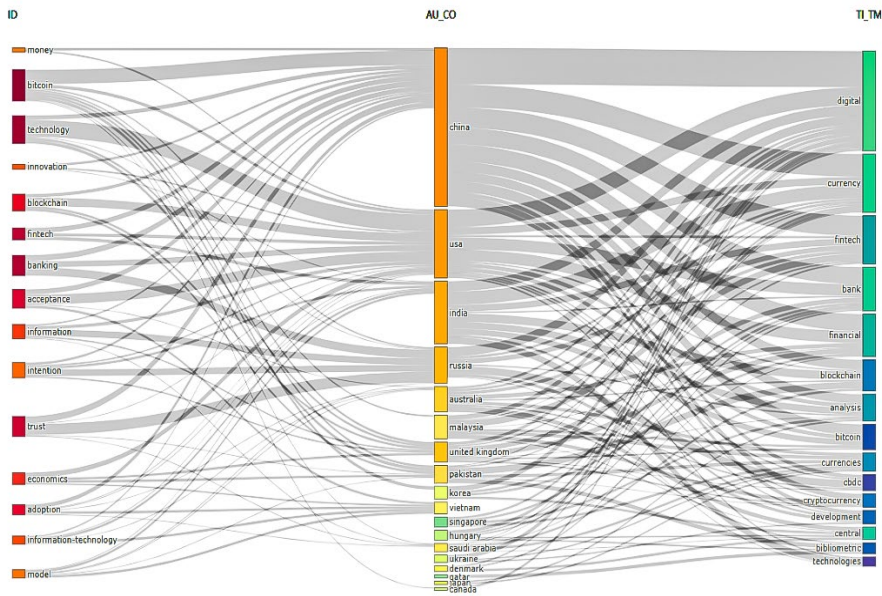


Fig. 3. Three-field plot based on literature coupling

4 Conclusion

A recent scientometric study illuminates the evolving landscape of digital currency development within the broader context of fintech innovation. The research highlights a unique global cooperation network characterized by a dual-core structure, driven by the distinct strengths of China and the United States. China's innovation path is fundamentally rooted in rapid technological iteration, capitalizing on advancements in central

bank digital currency (CBDC) technology and the optimization of blockchain protocols. Conversely, the United States excels in systemic innovation, setting benchmarks in the development of regulatory sandbox frameworks and the reconstruction of financial credit architectures.

This complementary division of labor forms the foundation of a cross-border collaborative innovation ecosystem. While China focuses on the tangible technological advancements driving digital currency functionality, the United States concentrates on establishing the regulatory and institutional infrastructure necessary for its safe and effective implementation. This synergistic relationship, characterized by the exchange of knowledge and expertise, contributes significantly to the global advancement of digital currency and its integration into the evolving financial technology landscape. Ultimately, understanding this dual-core dynamic is crucial for comprehending the trajectory and potential of digital currencies in shaping the future of finance.

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