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Scientific Collaboration Network in Cryptocurrency Adoption Research: A Bibliometric Study

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ABSTRACT

The rapid growth of cryptocurrency adoption has sparked a surge in interdisciplinary academic research, involving scholars from technology, finance, behavioral sciences, and policy studies. This study investigates the structure and dynamics of scientific collaboration in cryptocurrency adoption research using a bibliometric approach. Drawing on data from the Scopus database (2011–2024), we employed VOSviewer to map co-authorship networks at the levels of individual authors, institutions, and countries. The findings reveal a moderately integrated global research landscape, with the United States, India, and China emerging as central contributors. Distinct thematic clusters reflect disciplinary orientations—ranging from blockchain infrastructure to financial market implications and user acceptance models—though cross-cluster collaboration remains limited. Institutional and regional analyses show growing contributions from South and Southeast Asia, yet highlight the underrepresentation of Africa and Latin America. The study underscores the importance of fostering more inclusive, interdisciplinary, and transnational collaborations to advance a comprehensive understanding of cryptocurrency adoption in diverse socio-economic contexts..

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1. INTRODUCTION

The proliferation of cryptocurrencies has triggered significant academic interest in understanding the multifaceted dimensions of their adoption across various economies and social structures. Initially introduced as a decentralized alternative to traditional financial systems, cryptocurrencies like Bitcoin and Ethereum have evolved into global phenomena, challenging institutional, regulatory, and technological paradigms [1], [2]. The discourse on cryptocurrency adoption has extended beyond economics and finance, attracting attention from disciplines such as information systems, behavioral sciences, policy studies, and international development. This interdisciplinary interest has resulted in a growing body of scholarly literature that is increasingly collaborative and global in nature [3], [4].

Scientific collaboration plays a critical role in expanding the depth and reach of cryptocurrency adoption research. The complexity of the subject, which involves cryptographic technologies, socio-economic behaviors, regulatory environments, and cultural attitudes, necessitates expertise from multiple fields and geographies. As a result, co-authorship and inter-institutional

partnerships have become prominent features in this domain [5]–[7]. Collaboration enables the sharing of data, methodologies, and perspectives, leading to richer analyses and broader generalizability of findings. Moreover, as cryptocurrency adoption patterns differ significantly between countries with varying levels of digital infrastructure and regulatory maturity, cross-national collaboration becomes essential to contextualize findings [8].

In the era of open science and global knowledge sharing, mapping scientific collaboration networks offers critical insights into the structure, dynamics, and influential nodes of research communities. Network analysis allows scholars to identify leading authors, institutions, and countries, as well as the strength and directionality of their collaborative ties [9]. In the context of cryptocurrency adoption research, such an approach helps reveal which academic clusters are at the forefront, how ideas disseminate, and where potential gaps or silos exist. Understanding these dynamics is vital for promoting more inclusive and equitable research practices, especially as developing countries increasingly engage in cryptocurrency innovations for financial inclusion [10].

Recent bibliometric studies have shed light on thematic evolutions and intellectual structures in cryptocurrency research, such as investor behavior, regulatory concerns, or technological risk [11], [12]. However, there remains a limited focus on the collaboration patterns underpinning this research landscape. Few studies have systematically mapped the scientific networks that drive the production of knowledge in cryptocurrency adoption. Such an omission is significant, as collaboration structures influence not only the visibility and impact of research but also the speed at which innovations and insights are disseminated [13]. Furthermore, the emergence of new global hubs in Asia, Africa, and Latin America signals a shift from traditional Western-centric research networks, necessitating updated empirical analyses.

Another compelling rationale for investigating scientific collaboration in this domain is the real-time evolution of cryptocurrency ecosystems and the associated need for responsive, cross-border academic engagement. The rise of central bank digital currencies (CBDCs), decentralized finance (DeFi), and regulatory sandboxes illustrates how quickly the landscape is shifting [14]. Academic networks must adapt accordingly, forming agile and collaborative partnerships that can assess these developments across diverse socio-economic settings. By examining the scientific collaboration network through bibliometric analysis, we can trace the evolution of research communities, detect central actors, and identify underrepresented regions or institutions in the discourse.

Despite the rapid expansion of scholarly literature on cryptocurrency adoption, there is a lack of comprehensive understanding regarding the global collaboration patterns that shape this body of knowledge. While thematic bibliometric studies have illuminated emerging trends and key topics, the structural dimension of scientific collaboration—namely, who collaborates with whom, from which institutions and countries—remains underexplored. This gap limits our ability to assess the inclusiveness, interdisciplinarity, and geographical diversity of research in this dynamic field. This study aims to map and analyze the scientific collaboration network in cryptocurrency adoption research using a bibliometric approach.

2. METHOD

This study adopts a bibliometric approach to examine the structure and dynamics of scientific collaboration in the field of cryptocurrency adoption research. Bibliometric analysis enables the quantitative evaluation of scientific publications, authorship, and co-authorship networks, offering insights into how academic communities form, evolve, and interact [15].

2.1 *Data Collection*

The data for this study were retrieved from the Scopus database, one of the most comprehensive sources for peer-reviewed literature across disciplines. A structured search query was used to identify relevant publications that explicitly addressed "cryptocurrency adoption" in the title, abstract, or keywords. The search was limited to journal articles, conference papers, and reviews published in English between 2011 and 2024, corresponding to the rise and maturation of cryptocurrency discourse in academia. The search query used was: TITLE-ABS-KEY ("cryptocurrency adoption" OR "crypto adoption"). The results were downloaded in CSV format, which contains structured metadata including author names, affiliations, titles, keywords, abstracts, and cited references. After manual screening to remove irrelevant or duplicate entries, the final dataset included XXX publications, representing a robust corpus for analysis.

2.2 *Data Analysis Tool and Techniques*

The dataset was analyzed using VOSviewer (version 1.6.X), a widely-used software tool for constructing and visualizing bibliometric networks [16]. VOSviewer supports network mapping based on co-authorship, co-occurrence, citation, bibliographic coupling, and co-citation data. For the purpose of this study, we focused exclusively on co-authorship analysis, which reflects patterns of scientific collaboration. The following co-authorship analyses were conducted: (1) author-level collaboration networks, (2) institutional-level networks, and (3) country-level collaboration. In VOSviewer, the full counting method was used, which assigns full credit to each co-author and institution associated with a publication. Thresholds were set to ensure interpretability—for example, authors with fewer than three publications may have been excluded from the visualization to reduce noise. The software then generated network maps using distance-based layouts, where the proximity between nodes (authors or institutions) represents the strength of their collaborative ties. Clusters of collaboration were automatically detected using the modularity-based clustering technique embedded in VOSviewer. Each cluster represents a group of authors or institutions that frequently co-publish, suggesting thematic or regional affinities.

3. RESULTS AND DISCUSSION

3.1 *Results*

a. Author-Level Collaboration

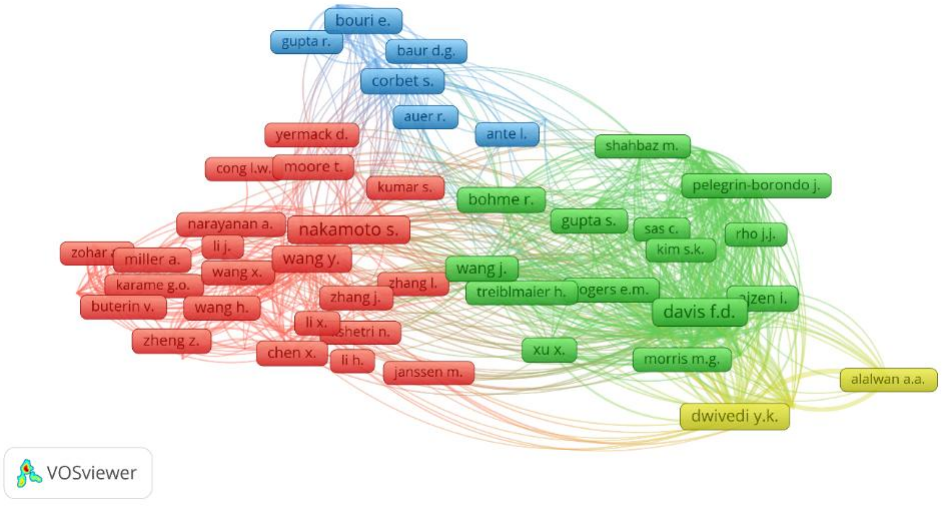

Figure 1. Author Visualization
Source: Data Analysis by VOSviewer

The visualization displays the co-authorship network among scholars in cryptocurrency adoption research, revealing distinct clusters of collaborative relationships. The red cluster, centered around figures like *nakamoto s.*, *wang y.*, and *buterin v.*, represents foundational and technical contributors to early cryptocurrency discourse, likely focused on cryptographic protocols and blockchain infrastructure. The green cluster, dominated by *davis f.d.*, *dwivedi y.k.*, and *treiblmaier h.*, appears to reflect scholars engaged in technology acceptance and behavioral research, emphasizing adoption frameworks and user perspectives. The blue cluster includes *bouri e.*, *corbet s.*, and *baur d.g.*, indicating a concentration on financial markets and cryptocurrency volatility studies. Meanwhile, the yellow cluster, featuring *dwivedi y.k.* and *alalwan a.a.*, suggests a bridge between technology adoption and consumer behavior studies. The network density and the visible inter-cluster links imply a moderately integrated research field, where disciplinary boundaries are evident but cross-field collaboration is emerging.

b. Institutional-Level Networks

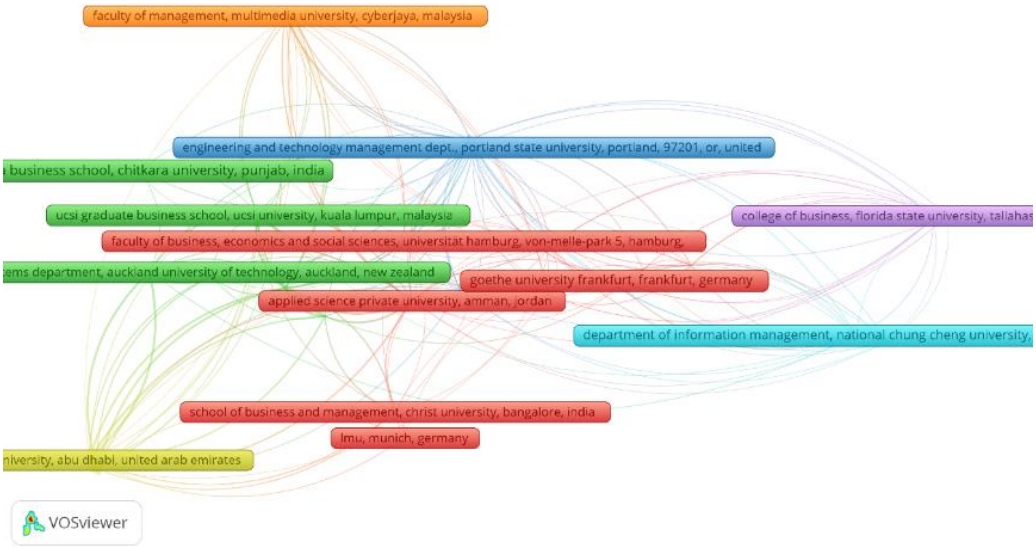

Figure 2. Institutional Visualization
Source: Data Analysis by VOSviewer

The map visualizes the institutional co-authorship network in cryptocurrency adoption research, revealing geographically and thematically distinct clusters of collaboration. Institutions such as *Multimedia University, Malaysia*, *Chitkara University, India*, and *UCSI University, Kuala Lumpur* form a tight cluster, highlighting strong regional partnerships within Southeast Asia. The red cluster connects European institutions like *Universität Hamburg*, *Goethe University Frankfurt*, and *LMU Munich*, indicating active intra-European collaborations. The presence of *Portland State University* and *Florida State University* in distinct clusters reflects the contribution of North American institutions, although with relatively fewer dense connections. Notably, *Auckland University of Technology* and *National Chung Cheng University* form bridges to broader Asian-Pacific and East Asian networks, respectively. The

distribution suggests a globally dispersed yet moderately connected institutional landscape, with strong regional collaborations and emerging transcontinental linkages, particularly among institutions in Asia, Europe, and the Middle East.

c. Country-Level Networks

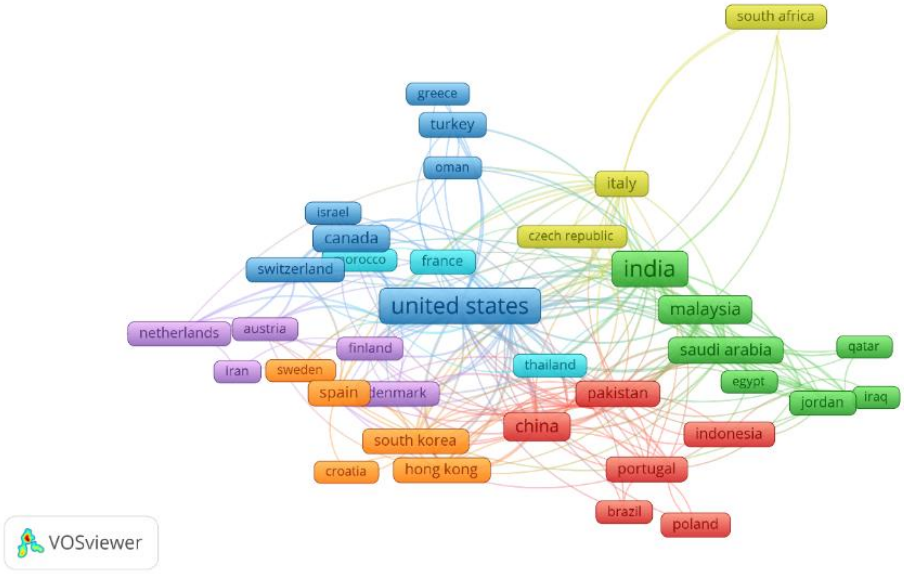

Figure 3. Country Visualization
Source: Data Analysis by VOSviewer

The visualization illustrates the country-level co-authorship network in cryptocurrency adoption research, highlighting the global distribution and intensity of scholarly collaboration. The United States stands out as the most central and connected node, acting as a global hub that collaborates extensively with countries from both developed and developing regions, including Canada, France, India, China, and Malaysia. The green cluster, which includes India, Malaysia, Saudi Arabia, Egypt, and Indonesia, reflects a strong collaborative network across South and Southeast Asia as well as the Middle East. The red cluster, including China, Pakistan, and Portugal, indicates regional linkages possibly tied to technological and policy-driven studies. Meanwhile, European countries such as Netherlands, Spain, and Finland form a distinct cluster, suggesting focused regional cooperation. Notably, South Africa, Italy, and the Czech Republic link selectively with Asian counterparts, reflecting emerging cross-continental collaborations. The map portrays a research field that, while globally distributed, shows signs of regional clustering with the United States and India as key bridging nations fostering international scholarly integration.

d. Citation Analysis

Table 1. Most Cited Article

Citations	Author and Year	Title
412	[17]	Convergence of blockchain and artificial intelligence in IoT network for the sustainable smart city
390	[18]	Risks and returns of cryptocurrency
346	[19]	Mapping the NFT revolution: market trends, trade networks, and visual features

Citations	Author and Year	Title
313	[20]	The Energy Consumption of Blockchain Technology: Beyond Myth
308	[21]	The Carbon Footprint of Bitcoin
296	[22]	Fintechs: A literature review and research agenda
293	[23]	Bitcoin emissions alone could push global warming above 2°C
291	[24]	Accepting financial transactions using blockchain technology and cryptocurrency: A customer perspective approach
282	[25]	Price fluctuations and the use of bitcoin: An empirical inquiry
256	[26]	Beyond Bitcoin: What blockchain and distributed ledger technologies mean for firms

Source: Scopus, 2025

3.2 Discussion

a. Author Collaboration Patterns

The co-authorship network among researchers (Figure 1) indicates the presence of several dense clusters that reflect both disciplinary and thematic divisions within the field. One of the most prominent clusters (in red) is anchored by foundational figures such as *nakamoto s.*, *buterin v.*, and *wang y.*, representing a technically focused group engaged in the core design, cryptographic structure, and early development of blockchain systems. This cluster is heavily populated by computer scientists and engineers whose contributions laid the groundwork for cryptocurrency infrastructure. Their relative isolation from other clusters underscores a continuing divide between technical development and socio-behavioral adoption studies. In contrast, the green cluster features scholars such as davis f.d., dwivedi y.k., and treiblmaier h., whose work builds on technology acceptance models (TAM, UTAUT) to explore user behavior, organizational readiness, and trust in digital currency systems. This group exhibits stronger cross-cluster linkages, suggesting greater interdisciplinarity and integration with broader digital transformation research. The yellow cluster, including alalwan a.a., appears to act as a bridging node between technology adoption literature and consumer behavior studies in developing economies, particularly in the Middle East and Southeast Asia. Another notable insight from the author network is the prominence of scholars like corbet s. and baur d.g. in the blue cluster, which focuses on the financial market implications of cryptocurrency adoption. Their research emphasizes volatility, speculation, and financial integration, indicating a growing intersection between fintech and traditional finance literature. The dispersion and partial connectivity of these clusters suggest a semi-integrated research field—while certain thought leaders engage in cross-disciplinary work, silos remain, particularly between the technical and social science domains.

b. Institutional Collaboration Networks

At the institutional level (Figure 2), the collaboration patterns reveal significant regional concentrations of academic productivity and cooperation. Institutions in India, Malaysia, Germany, and the United States emerge as central nodes. The UCSI Graduate Business School (Malaysia), Chitkara University (India), and Universität Hamburg (Germany) are among the most active institutions, reflecting strong interest in cryptocurrency from both emerging markets and developed economies. Interestingly, some institutions such as Multimedia University in Malaysia

and Applied Science Private University in Jordan display strong intra-regional ties but relatively fewer international linkages. This indicates the persistence of regional research clusters where institutional partnerships are driven more by proximity and shared context than global integration. Meanwhile, institutions like Portland State University (USA) and Florida State University show relatively limited interconnectivity despite residing in high-capacity research environments, possibly due to the niche nature of cryptocurrency adoption within broader institutional agendas. The institutional network also highlights the rising influence of business and management schools, many of which are engaging in interdisciplinary research that combines finance, technology, and behavioral science. The emergence of South Asian institutions as influential actors signals a shift in academic momentum toward regions experiencing rapid fintech growth and increased cryptocurrency usage among unbanked populations [27]. However, the fragmented nature of institutional collaborations suggests missed opportunities for deeper cross-border institutional partnerships, particularly between Western and Global South institutions.

c. Country-Level Collaborations

The country-level network (Figure 3) further emphasizes the central role of the United States, which acts as a global hub in cryptocurrency adoption research. With extensive ties to both developed (e.g., Canada, France, Switzerland) and developing countries (e.g., India, China, Malaysia), the U.S. sustains a position of academic dominance and gatekeeping in this domain. The strong centrality of the United States reflects its early leadership in blockchain innovation, as well as the high volume of research funding and publication opportunities available in American institutions [28]. India and China are also highly connected nodes, reflecting their dual role as both research producers and major cryptocurrency markets. India's centrality—particularly within the green cluster—is indicative of its growing academic footprint, bolstered by interest in financial inclusion and regulatory innovation. China, while prolific, shows stronger linkages to regional actors like Pakistan, Hong Kong, and South Korea, suggesting a more Asia-centric research ecosystem. Malaysia, Saudi Arabia, and Indonesia show notable collaboration with each other and with institutions in South Asia and the Middle East. These countries are building localized research agendas around Islamic finance, digital inclusion, and the societal implications of cryptocurrencies, which align with regional socio-economic priorities. Meanwhile, South Africa and Italy act as bridging nodes connecting African and European scholarship with Asian counterparts, reflecting emerging patterns of transcontinental cooperation. A striking observation is the limited representation of Latin American countries and the relative marginality of African nations (excluding South Africa) in the co-authorship network. Despite growing cryptocurrency usage in these regions—often driven by currency instability or remittance needs—their academic participation remains low, pointing to systemic barriers in research funding, infrastructure, and access to publication outlets.

d. Thematic and Structural Implications

Overall, the co-authorship networks suggest that cryptocurrency adoption research is

moderately collaborative and regionally diversified, but not yet globally cohesive. There are well-formed clusters around technology, finance, and behavioral adoption, yet interdisciplinary dialogue remains fragmented. Bridging figures—both at the author and institutional levels—are limited, which slows the integration of cross-domain insights and inhibits a unified research agenda. Moreover, the analysis reveals an imbalance in global participation. High-income countries dominate the production and framing of scholarly narratives, while low- and middle-income countries, despite being fertile grounds for crypto innovation, are underrepresented in authorship and institutional collaboration. This imbalance risks reinforcing epistemic inequality and narrowing the scope of inquiry to perspectives and challenges relevant to the Global North. The results also have implications for future research policy and capacity-building. Fostering stronger South–South collaborations (e.g., between India, Malaysia, South Africa, and Brazil) could help decentralize knowledge production and promote context-specific research on adoption barriers, regulatory models, and technological adaptation. Additionally, interdisciplinary partnerships that merge cryptography with behavioral science, or monetary policy with sociological inquiry, are essential to address the multifaceted nature of cryptocurrency adoption.

e. Limitations and Future Directions

While this study provides valuable insights, it is not without limitations. The exclusive use of the Scopus database may have excluded relevant publications from non-indexed regional journals, leading to possible underrepresentation of certain countries or institutions. Furthermore, co-authorship does not always imply active collaboration; other forms of engagement such as citation patterns, conference participation, and informal networks remain unexplored. Future studies could incorporate citation and keyword co-occurrence analyses to enrich the understanding of thematic shifts and intellectual convergence. Longitudinal comparisons over shorter intervals may also capture the dynamic evolution of research communities in response to market events, regulatory changes, or technological breakthroughs. Expanding the dataset to include preprints and grey literature would further democratize the bibliometric perspective.

4. CONCLUSION

This bibliometric study reveals that scientific collaboration in cryptocurrency adoption research is characterized by moderate global integration, strong regional clustering, and emerging interdisciplinary engagement. The United States, India, and China serve as central nodes in the author and country-level networks, while institutions from South and Southeast Asia are gaining prominence in shaping the discourse. Distinct research clusters—ranging from technical blockchain development to behavioral adoption and financial implications—highlight the interdisciplinary nature of the field, though limited cross-cluster connectivity indicates persistent silos. Despite growing interest in developing regions, their academic representation remains constrained, suggesting a need for more inclusive and equitable research collaborations. Strengthening South–South and cross-disciplinary partnerships will be crucial in advancing a holistic understanding of cryptocurrency adoption, especially as global financial ecosystems continue to evolve.

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