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Fintech and Traditional Banking: A Bibliometric Study of Financial Innovation

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ABSTRACT

Financial technology (fintech) has emerged as a transformative force reshaping the financial industry, influencing traditional banking institutions and introducing innovative business models. This study conducts a bibliometric analysis of fintech and traditional banking research using data from Scopus and visualization through VOSviewer. The analysis explores thematic trends, key research contributions, and evolving collaborations within financial innovation. Findings reveal that fintech has transitioned from being a disruptive force to an integral component of the financial ecosystem, fostering partnerships with traditional banks. Key themes include digital banking, blockchain, artificial intelligence, financial inclusion, and regulatory challenges. The study highlights the increasing role of emerging technologies in enhancing financial services while addressing cybersecurity and compliance concerns. Global research collaboration patterns indicate a strong focus on financial inclusion and regulatory frameworks across different economies. This research provides valuable insights into the trajectory of fintech literature and identifies areas for future exploration, particularly in sustainability, AI-driven finance, and central bank digital currencies (CBDCs).

Keywords: *Fintech, Traditional Banking, Financial Innovation, Bibliometric Analysis, Blockchain.*

1. INTRODUCTION

Financial innovation has played a crucial role in shaping the modern financial landscape, significantly influencing both traditional banking institutions and emerging fintech firms. Over the past few decades, rapid technological advancements have transformed how financial services are delivered, moving away from brick-and-mortar banking to more digital and technology-driven solutions [1]. Fintech, an abbreviation for financial technology, has emerged as a disruptive force, leveraging advanced digital tools such as artificial intelligence, blockchain, big data analytics, and cloud computing to provide faster, more accessible, and cost-effective financial services [2]. These innovations have not only challenged traditional banking models but have also encouraged them to adapt and integrate new technologies to remain competitive.

Traditional banks have long dominated the financial sector, providing services such as lending, deposits, wealth management, and payment processing through conventional infrastructures. However, fintech firms have introduced innovative business models that eliminate many of the inefficiencies associated with traditional banking, particularly in terms of speed, transparency, and cost-effectiveness [3]. For instance, peer-to-peer (P2P) lending platforms and decentralized finance (DeFi) applications have revolutionized access to credit by directly connecting borrowers with lenders, bypassing intermediaries and reducing operational costs [4]. Moreover, digital-only banks, or neobanks, have emerged as serious competitors to traditional banks by offering fully online financial services with a focus on customer experience, efficiency, and automation.

Despite the growing prominence of fintech, traditional banks still play a vital role in the financial ecosystem due to their established regulatory frameworks, customer trust, and vast financial resources. Many banks have responded to fintech disruption by embracing digital transformation and forming strategic partnerships with fintech companies [5]. Banks have also leveraged open banking frameworks and application programming interfaces (APIs) to integrate fintech solutions into their operations, fostering a more collaborative rather than adversarial relationship between the two sectors [6]. This convergence has led to the emergence of hybrid financial models, where fintech firms and banks coexist, competing and collaborating to drive financial innovation forward.

The rapid growth of fintech has also raised significant regulatory and security concerns, prompting governments and financial authorities worldwide to adapt their policies to accommodate new financial technologies while ensuring consumer protection and financial stability [7]. Cybersecurity threats, data privacy issues, and regulatory compliance challenges have become key concerns in the fintech sector, necessitating robust risk management frameworks and regulatory oversight [8]. As fintech continues to evolve, it is crucial to examine how regulatory approaches differ across regions and how they impact the growth and stability of both fintech firms and traditional banks.

Given the significant impact of fintech on financial innovation and traditional banking, a bibliometric study is an essential approach to understanding the existing body of knowledge in this field. Bibliometric analysis allows researchers to evaluate trends, influential publications, key contributors, and the overall intellectual structure of a research domain [9]. By systematically analyzing academic publications, this study aims to provide a comprehensive overview of how fintech and traditional banking have been studied over time, identifying research gaps and potential future directions for financial innovation studies.

Despite the growing interest in fintech and its impact on traditional banking, there remains a lack of comprehensive bibliometric studies that systematically analyze the evolution of financial innovation literature. While many studies have explored specific aspects of fintech, such as blockchain, digital payments, and AI-driven financial services, few have examined the broader research trends and intellectual foundations shaping this field [10]. The lack of a consolidated bibliometric review hinders the ability of scholars, policymakers, and industry practitioners to grasp the trajectory of fintech research and its implications for traditional banking. Given the rapid advancements in financial technology and regulatory changes, there is an urgent need for a structured analysis of the scholarly discourse surrounding fintech and its intersection with traditional banking. This study aims to (1) analyze the publication trends and research impact within this domain, (2) identify the most influential authors, journals, and institutions contributing to fintech and banking research, (3) map the intellectual structure and thematic evolution of financial innovation studies, and (4) highlight existing research gaps and future directions.

2. LITERATURE REVIEW

2.1 Evolution of Fintech and Financial Innovation

The financial sector has undergone a significant transformation due to the advent of financial technology (fintech). Fintech represents the application of modern technological innovations to improve financial services, encompassing digital

payments, lending, wealth management, blockchain, and artificial intelligence-driven financial solutions [11]. The emergence of fintech can be traced back to the late 20th century with the rise of electronic banking and automated teller machines (ATMs). However, the last two decades have witnessed an unprecedented acceleration in fintech developments due to advances in internet penetration, mobile technology, and big data analytics [12]. Academic literature on fintech has primarily focused on its disruptive potential and implications for financial institutions. Researchers argue that fintech firms have introduced more agile, customer-centric, and cost-efficient financial services compared to traditional banks [13]. For instance, the rapid adoption of mobile payment platforms, such as Alipay and PayPal, has demonstrated how technology can enhance transaction speed and financial inclusion [14]. Furthermore, blockchain technology has facilitated the emergence of decentralized finance (DeFi), offering peer-to-peer transactions without intermediaries, thereby reducing transaction costs and increasing transparency [15].

2.2 Traditional Banking in the Era of Fintech Disruption

Traditional banks have long been regarded as the backbone of financial stability, providing services such as credit intermediation, deposit management, and wealth preservation. However, the rise of fintech has challenged conventional banking models, forcing banks to adapt or risk obsolescence [16]. Scholars have examined how banks are responding to fintech disruption through digital transformation, strategic partnerships, and regulatory compliance measures. A key strategy employed by banks is the integration of fintech solutions through open banking and the use of application programming interfaces (APIs) [17]. Open banking initiatives allow third-party developers to build innovative financial applications by leveraging banks' data and infrastructure. Additionally, banks are increasingly collaborating with fintech startups to co-develop digital financial products and services. Such partnerships help banks enhance their digital capabilities while providing fintech firms with access to financial expertise and regulatory support [18]. The literature also discusses the competitive advantages of traditional banks, particularly in areas such as risk management, regulatory compliance, and customer trust. Unlike fintech firms, which often face regulatory uncertainties, banks operate within well-established legal frameworks that offer credibility and consumer protection [19]. However, the challenge for banks lies in balancing regulatory requirements with the need for technological innovation to maintain competitiveness in the digital age.

2.3 Regulatory Challenges and Risk Management in Fintech and Banking

The rapid evolution of fintech has raised complex regulatory and security challenges. Regulators worldwide are grappling with how to balance innovation with financial stability, consumer protection, and cybersecurity [20]. Different jurisdictions have adopted varying approaches to fintech regulation, ranging from supportive regulatory sandboxes to stringent compliance frameworks. Cybersecurity is a critical concern in fintech, given the increasing reliance on digital transactions and data-driven financial services. Researchers have highlighted the vulnerabilities associated with fintech applications, such as hacking threats, data breaches, and fraud risks [21].

Traditional banks, on the other hand, have more robust security infrastructures, although they are not immune to cyber threats. Consequently, there is a growing emphasis on strengthening cybersecurity measures through encryption, biometric authentication, and artificial intelligence-based fraud detection systems [22]. Moreover, regulatory challenges extend to anti-money laundering (AML) and know-your-customer (KYC) compliance. While fintech firms leverage innovative solutions such as AI-driven identity verification, regulatory bodies remain concerned about the potential misuse of digital financial services for illicit activities [23]. Addressing these challenges requires a collaborative approach between regulators, financial institutions, and technology providers to ensure a secure and compliant financial ecosystem.

2.4 Financial Inclusion and the Socioeconomic Impact of Fintech

One of the most significant contributions of fintech is its role in enhancing financial inclusion, particularly in underserved regions. Fintech has provided millions of unbanked individuals with access to financial services through mobile banking, digital wallets, and microfinance solutions [24]. Researchers have examined case studies of fintech-driven financial inclusion in developing economies, highlighting the impact of mobile money platforms such as M-Pesa in Kenya and Paytm in India. The socioeconomic implications of fintech extend beyond financial inclusion to economic growth and job creation. Fintech startups have contributed to the gig economy by facilitating digital payments and alternative lending solutions for freelancers and small businesses [25]. However, concerns have been raised regarding the digital divide, as access to fintech services is often limited by factors such as internet connectivity, digital literacy, and financial awareness [23]. Addressing these disparities requires targeted policy interventions to promote equitable access to fintech solutions across different socioeconomic groups.

3. METHODS

This study employs a bibliometric analysis approach to systematically examine academic literature on fintech and traditional banking, focusing on financial innovation. Bibliometric analysis is a quantitative research method that evaluates scholarly publications by analyzing citation patterns, co-authorship networks, and keyword trends to identify influential research contributions and thematic developments. Data for this study were exclusively collected from the Scopus database, ensuring comprehensive coverage of high-impact peer-reviewed articles published over the past two decades. The analysis was conducted using VOSviewer, a specialized bibliometric software tool, to perform publication trend analysis, citation analysis, and co-occurrence mapping. Network analysis was also applied to examine collaborations among authors, institutions, and countries, providing insights into the intellectual structure of the research field.

4. RESULTS AND DISCUSSION

4.1 Network Visualization

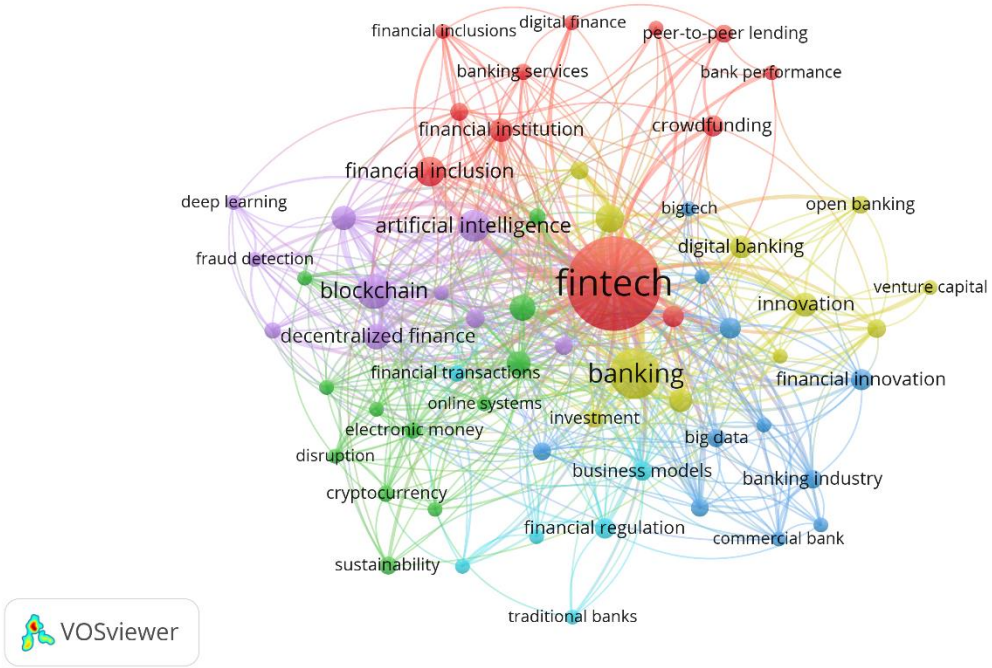

Figure 1. Network Visualization
Source: Data Analysis Result, 2025

The visualization represents a bibliometric network analysis of keywords related to fintech and traditional banking, as extracted from Scopus. The network is composed of interconnected nodes, each representing a keyword, with the size of the nodes indicating the frequency of occurrence in academic literature. Larger nodes, such as "fintech" and "banking," suggest that these terms are central to the research domain, while smaller nodes represent emerging or less frequently discussed topics. The lines between nodes indicate co-occurrences, meaning these terms frequently appear together in academic studies, highlighting thematic relationships. The color coding of the clusters represents different thematic areas within the field of fintech and banking research. The red cluster, for example, is primarily focused on financial inclusion, digital finance, banking services, and crowdfunding. This suggests that much of the literature in this area revolves around how fintech innovations are expanding financial access and reshaping traditional banking functions. The presence of terms like "peer-to-peer lending" and "bank performance" within this cluster indicates a focus on alternative lending mechanisms and their impact on traditional financial institutions.

The green cluster is largely centered around blockchain, decentralized finance, electronic money, and cryptocurrency. This indicates that a significant portion of the research is dedicated to exploring how blockchain technology and cryptocurrencies are transforming financial transactions and disrupting traditional banking models. The presence of "disruption" and "sustainability" in this cluster further suggests that researchers are interested in both the transformative and long-term implications of these technologies on the financial sector. The blue and yellow clusters highlight innovation, big data, financial regulation, and digital banking. These clusters indicate that researchers are studying how technological advancements, such as artificial intelligence and big data analytics, are being integrated into financial services. Open banking, venture capital, and business models also appear in these clusters, pointing to a growing interest in fintech startups and regulatory frameworks that enable innovation while ensuring financial stability.

The visualization provides a comprehensive overview of the research landscape in fintech and traditional banking. It highlights the interconnectedness of various themes, emphasizing that fintech is not just a disruptive force but also a driver of collaboration and innovation in the financial

sector. The clustering of keywords suggests key areas of academic interest, including financial inclusion, blockchain applications, regulatory challenges, and the evolving role of artificial intelligence in banking. These insights are valuable for identifying research gaps and guiding future investigations into financial innovation.

4.2 Overlay Visualization

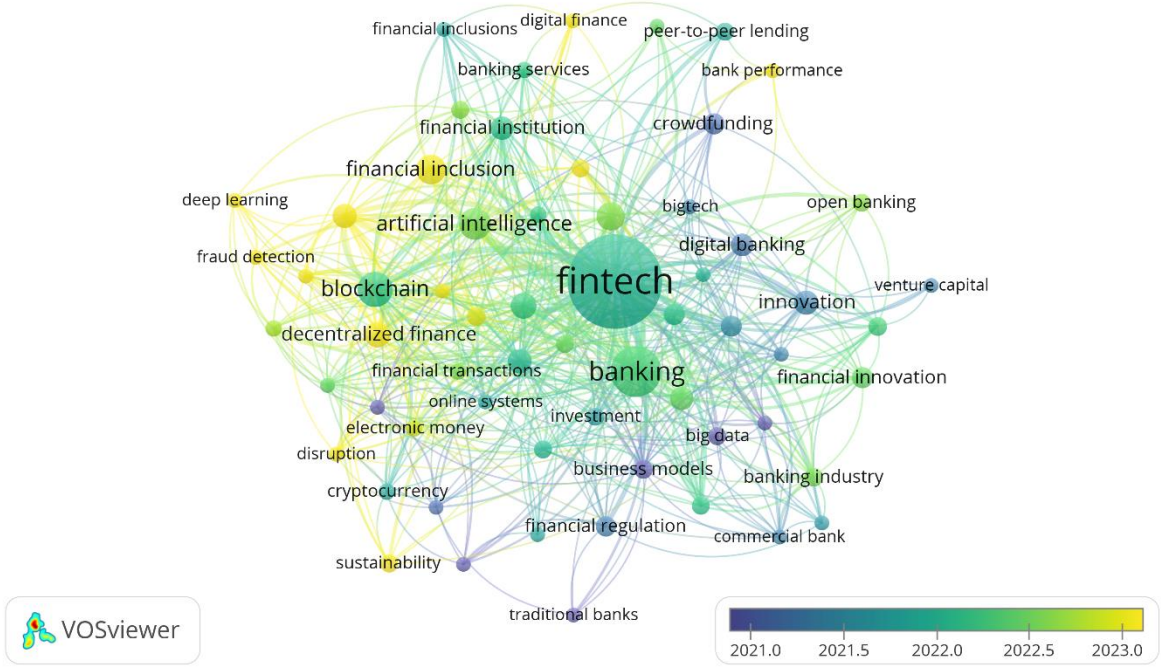

Figure 2. Overlay Visualization
Source: Data Analysis Result, 2025

The visualization represents a temporal analysis of keywords related to fintech and traditional banking, extracted from Scopus. The color gradient, ranging from blue (earlier years) to yellow (more recent years), indicates the evolution of research focus over time. Keywords in blue and green, such as "financial regulation," "commercial bank," and "big data," suggest that these topics have been explored extensively since 2021. In contrast, yellow-colored keywords like "artificial intelligence," "deep learning," and "fraud detection" indicate emerging trends that have gained prominence more recently, particularly in 2023. This suggests that fintech research has evolved from regulatory and foundational topics toward newer technological applications. The keyword network highlights the interconnected nature of research themes, with "fintech" and "banking" serving as central nodes. Keywords such as "financial inclusion," "blockchain," and "digital banking" are strongly linked, indicating their consistent role in shaping financial innovation. The growing focus on terms like "sustainability," "peer-to-peer lending," and "open banking" suggests an increasing emphasis on financial accessibility and alternative banking models. The presence of "venture capital" and "innovation" in the network also underscores the role of fintech startups and investments in driving technological advancements.

4.3 Citation Analysis

Table 2. The Most Impactful Literatures

Citations	Authors and year	Title
857	[26]	Fintech: Ecosystem, business models, investment decisions, and challenges

Citations	Authors and year	Title
257	[27]	Do fintech lenders penetrate areas that are underserved by traditional banks?
228	[28]	Decentralized finance
21	[29]	Can fintech improve the efficiency of commercial banks? —An analysis based on big data
154	[30]	Fintech, Cryptocurrencies, and CBDC: Financial Structural Transformation in China
136	[3]	Banking and fintech: A challenge or opportunity?
135	[12]	The transition from traditional banking to mobile internet finance: an organizational innovation perspective - a comparative study of Citibank and ICBC
121	[31]	The impact of FinTech start-ups on incumbent retail banks' share prices
107	[32]	Financial return crowdfunding: literature review and bibliometric analysis
92	[2]	Fintech as financial innovation - The possibilities and problems of implementation

Source: Scopus, 2025

4.4 Density Visualization

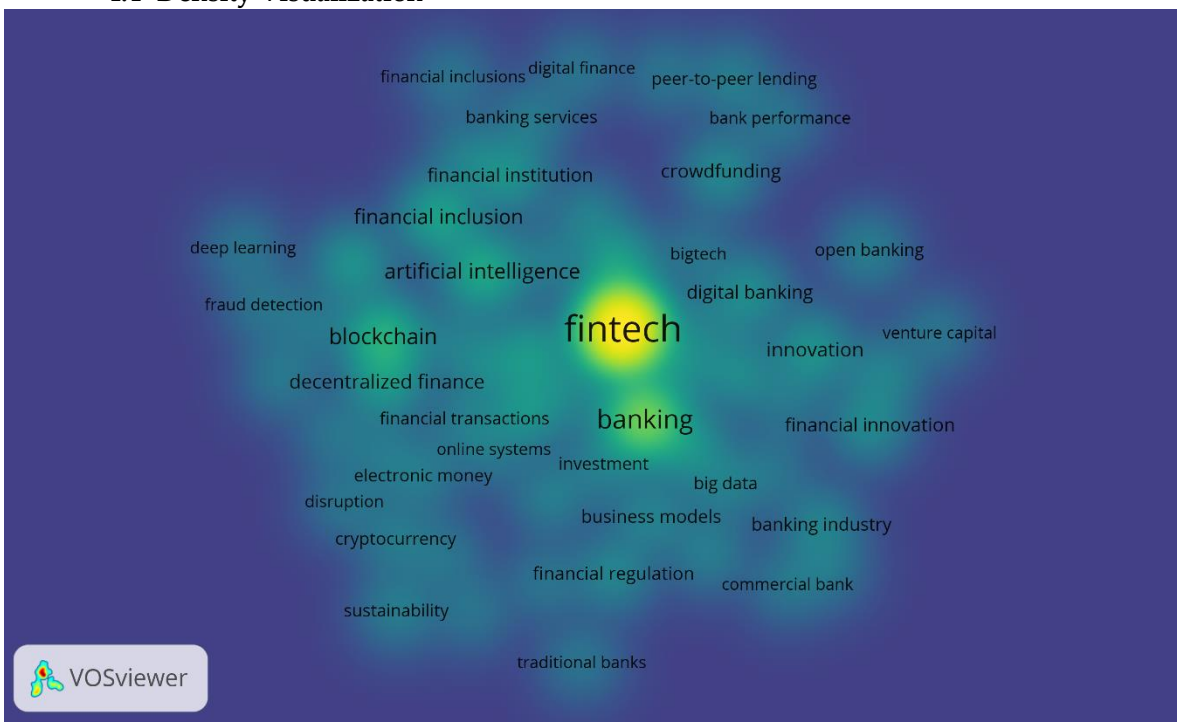

Figure 3. Density Visualization
Source: Data Analysis Result, 2025

The heatmap visualization illustrates the density of research focus in the field of fintech and traditional banking. The bright yellow areas indicate high research intensity, meaning that keywords like "fintech" and "banking" have received the most scholarly attention. Surrounding them, terms such as "digital banking," "financial inclusion," "blockchain," and "artificial intelligence" also show significant research engagement, as represented by the green regions. The darker areas suggest less frequently studied topics, highlighting emerging or niche research areas such as "deep learning," "sustainability," and "cryptocurrency." The heatmap reveals that fintech remains the central focus of

financial innovation research, with traditional banking closely linked. The significant attention given to "artificial intelligence" and "blockchain" suggests a growing interest in technological advancements reshaping the financial industry. Furthermore, the presence of keywords like "financial regulation" and "venture capital" indicates an awareness of both regulatory challenges and the role of investment in fintech development. The dispersion of research intensity suggests that while some areas are well-established, others, such as "sustainability" and "decentralized finance," may represent future research frontiers within fintech and banking studies.

4.5 Co-Authorship Network

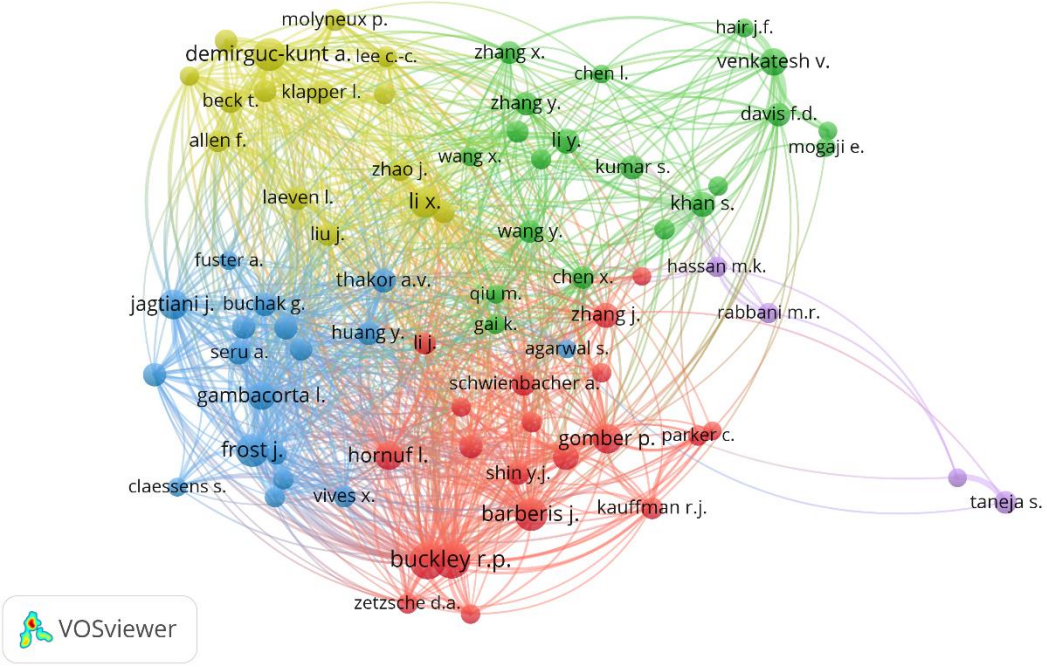

Figure 4. Author Visualization
Source: Data Analysis Result, 2025

The co-authorship network visualization highlights key authors contributing to fintech and traditional banking research. The different colored clusters represent distinct research communities, with authors in each cluster frequently collaborating. The red cluster, featuring scholars like Buckley R.P., Barberis J., and Gomber P., appears to focus on fintech regulation and innovation. The yellow cluster, which includes Demirguc-Kunt A. and Beck T., is likely associated with financial inclusion and banking stability. The green cluster, with authors like Zhang X. and Chen L., suggests a focus on technology-driven finance, including artificial intelligence and blockchain applications. The blue cluster, containing scholars such as Frost J. and Gambacorta L., likely emphasizes macroeconomic and financial policy aspects. A smaller, isolated purple cluster, including Taneja S., indicates limited collaboration with the broader network.

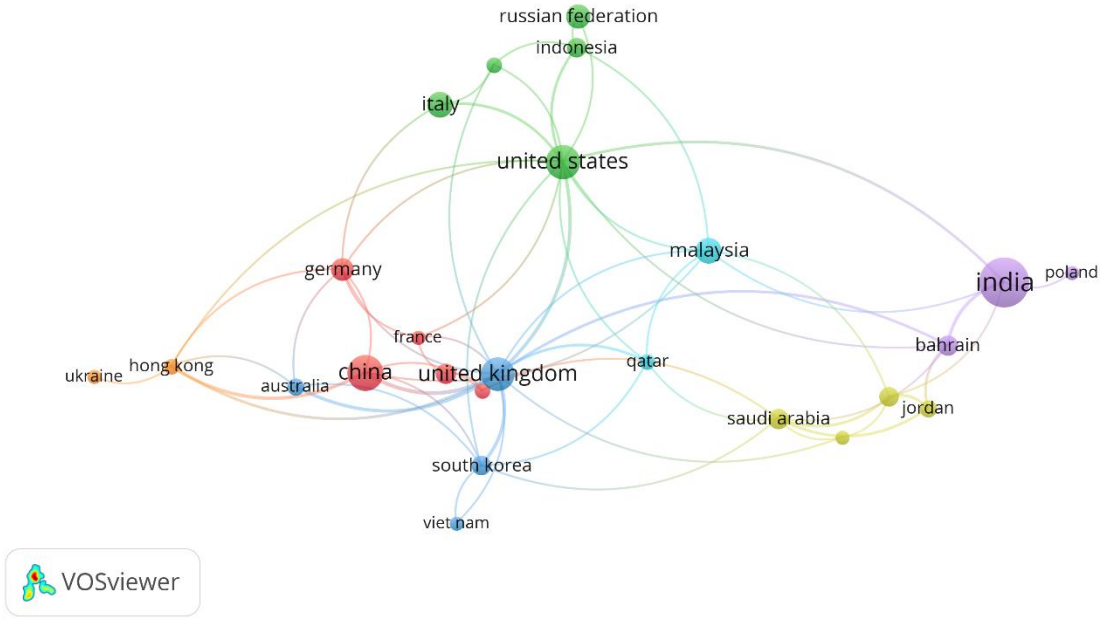

Figure 5. Author Visualization
Source: Data Analysis Result, 2025

The country collaboration network visualizes international research partnerships in fintech and traditional banking. The size of each country's node reflects its research output, while the connecting lines indicate co-authorship relationships. The United States, United Kingdom, and China are central players, demonstrating strong global collaborations, particularly with Germany, France, and Australia. The green cluster, including the U.S., Italy, and Indonesia, suggests a research focus on financial innovation and policy. The red cluster, featuring China and Germany, likely emphasizes fintech regulation and economic impacts. The blue cluster, led by the U.K. and South Korea, appears to be involved in digital banking and technological advancements. The purple cluster, with India and Poland, highlights regional collaborations in financial inclusion and emerging fintech markets.

Discussion

1. Thematic Trends in Fintech and Traditional Banking Research

The bibliometric analysis highlights significant thematic trends in fintech and traditional banking research, emphasizing financial innovation, regulatory challenges, and technological advancements. The network visualizations reveal that key themes such as digital banking, blockchain, artificial intelligence, and financial inclusion have gained prominence over the years. The central positioning of "fintech" and "banking" in the co-occurrence network confirms their dominant role in financial research, with interconnected themes such as "financial regulation," "big data," and "cryptocurrency" indicating a broad scope of exploration. The keyword evolution map further indicates that while early research focused on regulatory compliance and digital banking, recent studies have shifted towards AI-driven solutions, fraud detection, and sustainability in financial services.

The Evolving Relationship Between Fintech and Traditional Banks

One of the key findings from the bibliometric study is the evolving relationship between fintech firms and traditional banks. Initially, fintech was perceived as a disruptive force, challenging

conventional banking systems by introducing innovative, customer-centric solutions that reduced transaction costs and increased financial accessibility. However, the literature suggests that instead of a purely adversarial relationship, fintech and traditional banks have moved towards collaboration through partnerships, mergers, and open banking initiatives. Banks are increasingly integrating fintech solutions to enhance their digital capabilities, offering seamless digital banking experiences and leveraging AI for credit risk assessment and fraud detection. This shift from competition to cooperation is evidenced by the increasing frequency of research focusing on open banking, digital payment ecosystems, and hybrid financial models.

2. The Role of Regulation in Shaping Financial Innovation

Regulatory concerns remain a major theme in fintech research, as indicated by the prominence of keywords like "financial regulation," "compliance," and "cybersecurity." As fintech companies operate across multiple jurisdictions, regulatory challenges such as data privacy, anti-money laundering (AML) compliance, and consumer protection are critical areas of discussion. The co-authorship analysis indicates that scholars from different regions are actively engaged in understanding and addressing these challenges, reflecting the global nature of fintech regulation. Countries with strong regulatory frameworks, such as the United States and the United Kingdom, are found to be central nodes in research collaborations. The bibliometric analysis also shows a rise in studies on regulatory sandboxes, which allow fintech firms to test innovative financial products within a controlled regulatory environment. This suggests a growing effort to balance innovation with risk mitigation, enabling fintech growth while ensuring financial stability.

3. The Impact of Emerging Technologies on Financial Services

Technological advancements such as blockchain, artificial intelligence, and big data analytics have been transformative forces in the financial industry. The bibliometric network reveals that research on these technologies has gained significant momentum, particularly in relation to improving financial security, operational efficiency, and customer experience. Blockchain and decentralized finance (DeFi) have been widely studied for their potential to revolutionize financial transactions, eliminate intermediaries, and enhance transparency. AI and machine learning applications are being explored for fraud detection, algorithmic trading, and automated customer support. These trends indicate that financial innovation is increasingly driven by technological breakthroughs, making fintech an essential component of the digital economy.

4. Financial Inclusion and Socioeconomic Impacts

Another significant aspect revealed by the analysis is the role of fintech in promoting financial inclusion. The network visualization indicates that topics such as "financial inclusion," "peer-to-peer lending," and "microfinance" are closely connected, suggesting that fintech is expanding access to financial services for underserved populations. Mobile payment platforms, digital wallets, and alternative credit scoring mechanisms have enabled individuals and small businesses to participate in the financial system without relying on traditional banks. The prominence of research on financial inclusion also highlights the socioeconomic impact of fintech, particularly in emerging markets where banking infrastructure is limited. However, challenges such as digital literacy, internet accessibility, and cybersecurity risks remain barriers to achieving full financial inclusion.

5. Global Research Collaboration and Future Directions

The co-authorship and country collaboration networks reveal strong international cooperation in fintech research, with leading contributions from scholars in the United States, the United Kingdom, China, and India. These collaborations suggest that fintech is a global phenomenon, requiring cross-border regulatory discussions, technological standardization, and

knowledge exchange. The bibliometric analysis also indicates growing participation from emerging economies, particularly in research areas related to financial inclusion and mobile banking. Moving forward, future research should focus on exploring the long-term sustainability of fintech innovations, the ethical implications of AI-driven financial decision-making, and the role of central bank digital currencies (CBDCs) in reshaping monetary systems. Additionally, as cybersecurity threats continue to evolve, further research on risk management frameworks and regulatory interventions will be crucial in ensuring the resilience of digital financial ecosystems.

CONCLUSION

The bibliometric analysis of fintech and traditional banking research provides a comprehensive understanding of the evolution, impact, and future directions of financial innovation. The study reveals that fintech is no longer merely a disruptor but an integral part of the financial industry, working alongside traditional banks to enhance service efficiency, inclusivity, and security. Regulatory challenges, technological advancements, and financial inclusion remain key areas of academic inquiry, with global collaborations driving the field forward. As fintech continues to evolve, ongoing research will be essential in addressing emerging challenges and ensuring that technological advancements benefit the broader financial ecosystem.

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