





Global Research Trends in Fintech Technologies and Financial Fraud: A Bibliometric Analysis

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Abstract

Growing usage of Fintech on one hand has opened new ways of financial transactions but on the other hand has led to new methods of frauds and money laundering. Recent literature has attracted considerable attention in this direction. This paper provides a bibliometric view of recent advances in Fintech and related fraud. Scopus indexed research papers over the last two decades are taken into consideration. The paper informs and directs researchers on the current state of study and provides future research directions.

Keywords: bibliometric analysis, co-citation analysis, co-occurrence analysis, Fintech, financial fraud.

JEL Classification: G30, G32.



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Introduction

The growth of the financial sector accelerates the movement of the economy (Levine, 2003) not only within the country but development in the financial sector also impacts international trade (Abbasian et al., 2019). Technology has taken a great leap with the usage of concepts like artificial neural networks (Abbasian et al., 2019) and Fuzzy logic (Shahraki et al., 2023). The new concept of financial technology has emerged due to the digitalization of finance for fulfilling the requirement of existing user needs (Stojanović and Božić, 2022). New financial technology used for fund transfer, payment, and other financial transactions coined the term Fintech. Fintech services like ATMs (Automated Teller Machines) and electronic fund transfers are having a long-term impact on the demand for money (Tehranchian et al., 2012). The mechanism involved in processing financial transactions is complicated and requires knowledge related to hardware, software, network protocols, and cryptography. Traditional Banks and other financial organizations are always in the process of providing new and innovative Fintech options to customers. However, the usage of Fintech facilities always remains the target of cyber fraud (Nikkel, 2020). Fraud, in Fintech, means the creation or presentation of false financial information (Reurink, 2018). The criminals take advantage of Fintech facilities for cyber fraud. Fraud, not only, causes financial loss but also creates a psychological impact on the victims. This paper intends to provide a Bibliometric view of the literature available in the field of Fintech technology and financial fraud.

Technology remained a part of the financial service industry since 1850 (Murinde et al., 2022). Technology is thought to have a significant impact on industrial and economic progress (Khodadad Kashi et al., 2023). A potential breakthrough was created during the last two decades in financial services, processes, products, and applications (Feyen et al., 2021). Fintech services have not only combined with banking services but have replaced the traditional working model on many fronts. Thus, Fintech has increased the requirement of specialized human capital for its running and maintenance (Vives, 2019). The emergence of big tech, Fintech start-ups, and neo-banks can be seen in the financial services sector. The financial working model services like payment, lending, remittances, crowdfunding, insurance, capital market transactions, wealth management, personal finance management, enterprise finance management, digital banking, and cryptocurrencies fall under the head of Fintech.

Lack of liquidity has always been an obstacle to the growth of new businesses (Rakhshani et al., 2021). The traditional sources of financing like stock

markets, banks, and venture capitalists do careful screening before advancing money to borrowers who have limited access to finance (Berger et al., 2002). Fintech, on the other hand, provides an alternative to costly traditional financial intermediation through technological innovations (Hellwig et al., 2016). Technological innovation not only increases the capacity of Fintech lending but also adjusts supply elastically against demand shocks (Fuster et al., 2019). Fintech lenders use algorithms to fasten the credit rating process and reduce loan appraisal costs. Fintech lending involves big data analysis while doing credit assessment (Buchak et al., 2017)

Fintech has given way to peer-to-peer lending platforms (P2P) which has emerged as a new channel for small businesses and consumers. They are designed to eliminate the middleman like banks and connect the lender and the borrower directly. Fintech lending resulted in increased credit access facilities among users who cannot get credit from banks (Balyuk et al., 2018). These P2P platforms include crowdfunding, cryptocurrency trading, and initial coin offering (ICO). The dynamic behavior of the technology in Fintech lending has been shaped due to the presence of DLT (Distributed Ledger Technology).

Distributed ledger technology (DLT) is a decentralized data architecture that is used as the underlying technology for record keeping. Blockchain is one such open DLT used for creating verifiable records which has gained popularity because it gives way to create, track, and exchange online financial assets (Allen et al., 2020). In 2008 Nakamoto used this technology to float bitcoin (a crypto currency). Now, Blockchain is viewed as a Potential technology to eliminate the intermediation process in financial transactions. Blockchain has also become the basis of Smart contracts. They are decentralized self-enforcing computerized protocols that automatically execute when certain conditions are met (Allen et al., 2020). Due to the concept of blockchain tokens, the entrepreneurs were able to raise funds straight from investors across the world (Chen, 2018). Recently, all the entrepreneurs and investors have also given attention to the positive changes in society due to the revolution in Fintech (Murinde et al., 2022).

Given the importance of Fintech in the modern financial system, it is critical to understand how this new opportunity can benefit us and what can be the areas of concern. A review of Fintech and Fraud shall help us to zero down on critical trends and research areas in the field. A comprehensive understanding of intellectual structure in this field can provide a big picture to researchers in this area. The insights regarding various themes of possible research, information about

trending topics, and various future research endeavors will guide researchers toward the area of Fintech and financial fraud.

There exist few previous review studies about Fintech (Allen et al., 2020; Block et al., 2018; 2021a; Farag and Johan, 2021; Filatova et al., 2023; Goldstein et al., 2019). They provide discussions on Fintech related to industry, platforms, technology, public policy, and finance. Our Bibliometric analysis focuses on Fintech acting as alternative finance and the discussion on associated fraud.

Using the most popular method of bibliometric analysis, the research paper has the following objectives:

- a) To identify the trends in financial technology and financial fraud through bibliometric analysis.
- b) To know the prolific contributors, institutions, and countries for financial fraud and Fintech.
- c) To find out the most influential journals in financial technology and financial fraud.
- d) To explore the thematic structure of the research in financial technology and financial fraud and examine the clusters in detail.
- e) To provide the other topics and future direction in the field of financial fraud and Fintech.

Background of Fintech and Financial Fraud

Fraud related to Fintech is one of the emerging fields of research (Lucey et al., 2023). There is growing importance of Fintech lending as it fills the gaps created by traditional banks, thereby leading to a positive economic effect (Buchak et al., 2017). The COVID-19 pandemic induced a slowdown in the economy and created disruptions in organizational capital demand which fuelled the requirement for Fintech facilities and related fraud (Karpoff, 2021). Fintech transactions involve the intangible exchange of rights and act as a linchpin for all banking, financial markets, and other money-related online transactions.

The development of financial technology has been influenced by various threats. With the emergence of big data and cloud technology, there are high chances for cyber-attacks posing a challenge to Fintech (Mehrban et al., 2020). Despite the intention to deliver benefits, new technology may also present unanticipated cyber threats. The difficulties were typically related to the high complexity of governance, hazy business process designs, and technical weaknesses of new systems (Qiu, 2017). P2P platforms like crowdfunding (CF),

crypto currency (CC) trading, and initial coin offering (ICO) pose a major threat to users.

ICOs are smart contracts that run on distributed ledger technology (DLT). ICO can raise funds without an intermediary as they signal information for themselves. The fundraising is done by issuing coins or tokens that are tradable. Block et al. (2021a) present a comparison between CF and ICO based on regulation, marketing, and innovation. CF involves intermediaries, whereas ICO does not. This lack of intermediaries makes ICOs more vulnerable to fraud compared to CF. Since there is a lack of proper regulation in ICO, it paves the way for scammers to create fake white papers of the project and tap investors. This makes ICOs less reliable which decreases the confidence of investors in ICOs (Hashemi Joo et al., 2020).

The collapse of stock markets in 2007 shocked the confidence of investors in the traditional system which gave birth to the Bitcoin concept by "Satoshi Nakamoto" in 2008 (Nakamoto, 2008). The distinctive characteristics of Bitcoin are its pseudo-anonymity and decentralization which makes it popular among cyber criminals and Dark net Entrepreneurs (Brown, 2016). Soon bitcoin became the way to ask for ransom from Banks if their websites were hacked as there was no central control in the case of Bitcoin which can be held responsible. CCs will remain a potential risk or will become a significant threat depending on the effectiveness of regulatory oversight and law enforcement (Brown, 2016). Not only Ransome, CC's also paved the way for money laundering and Ponzi Schemes. Bartoletti et al. (2018) focused on his study of Ponzi schemes created via Bitcoin. Under Ponzi schemes the investment of new investors is used to pay the old investor and the cycle goes on until no new investor is trapped. Such cybercrimes through blockchain technology made CC a source of financial fraud (Campbell-Verduyn, 2018).

Looking at the threat posed by Fintech tools for investors more guarded way to deal with Fintech tools is required. The vulnerability of Fintech is enhanced because it is difficult to trace the fraud due to DLT and fund creation without geographic boundary limitation. Hence an area of study has emerged both for researchers and regulators to explore ways for making Fintech tools safe for users. ICO is next generation IPO (Hashemi Joo et al., 2020) but the investors are required to thoroughly check whether the white paper follows required due diligence or not. The issuer of ICO should increase transparency to build trust and a regulatory framework is required for preventing any fraud (Tiwari et al., 2020). CCs have created acceptance over time but their use in money laundering, if not

addressed, can ultimately undermine the stability of the global economy (Albrecht et al., 2019). Smart cyber criminals make it difficult to detect fraud and Ponzi schemes which creates a pressing need for the creation of automated systems for their detection (Bartoletti et al., 2018).

Methods and Materials

Description of Appropriate Search Item

This study combines two interdisciplinary concepts - Financial fraud and Fintech, based on the premise that Fintech has led to a rise in various kinds of financial frauds. The study includes keywords about both concepts. We have chosen the Scopus database as it is easy to navigate and provides wide access to research papers (Burnham, 2006). Hence this database is utilised to pick the relevant research papers related to our research topic.

Conceptually, financial fraud is defined to include financial disclosure, financial scams, and financial mis-selling. But it has been extended to some other terms named as; financial misconduct; financial crime; securities fraud; financial statement fraud; and white-collar crime (Reurink, 2018).

To ensure that all the components of Fintech and financial fraud have been included in this research, it was necessary to include all keywords relating to each area. After conducting the preliminary search for various aspects of the topic, the various terms that are connected to Fintech are blockchain, digital finance, cryptocurrencies, and digitization. Similarly for financial fraud, the related terms are financial misconduct; financial crime; securities fraud; financial statement fraud; and white-collar crime.

Table 1. Criteria for Inclusion & Barring of Articles

Selection Basis	Exclude	Include
Database "Scopus"		
Date of search "09 August 2023"		
Period of Publication: 1997-2023		
Search terms: "financial fraud" OR "Insider trading" OR "money laundering" OR "Ponzi schemes" OR "market manipulation" OR "insurance fraud" OR "security and commodity fraud" OR "Forged Bank cheques" OR "tax evasion" OR crowdfunding OR "false financial disclosure" OR "financial scams" OR "financial mis-selling" AND blockchain OR Fintech OR "technological development" OR cryptocurrencies OR digitization	-	1003
Subject Area: Business Management & Accounting, Economics, Econometrics and Finance, social sciences, Arts & Humanities	437	566
Publication type: "Articles, Book Chapter, Conference Paper, Review"	41	525
Language Screening: "Documents published in English Only"	24	501
Year Screening: Data included from year 2011-2023	4	497
Errorness Record Cleaning. 'Include a document with valid author information only'	2	495

Source: Research finding.

Data Collection

Scopus has been chosen for conducting this analysis as it is an abstract and citation database consisting of peer-reviewed scientific content. The content under this database is selected through a rigorous process and ensures extensive quality and improved data elements (Baas et al., 2020). We have employed an orderly technique to arrive at the final count of 495 articles in Table 1. Keywords such as "financial fraud", "insider trading", "money laundering", "Ponzi scheme", "market manipulation", "insurance fraud", "security commodity fraud", "forged bank cheques", "tax evasion", "crowdfunding", "false financial disclosure", "financial scams", "financial mis-selling" combined with "blockchain", "Fintech", "digital finance", "cryptocurrencies", and "digitization" were used to identify articles published in the English language from the list of various disciplines as shown in Table 1. The data collected from the Scopus database, or any other database may contain errors and may result in incorrect analysis (Donthu et al., 2021). Thus, we need to apply various methods and procedures to clean the data and then use the

data for further analysis. Subsequently, to synthesize the past research findings, we use bibliographic data as well as visualization techniques for evaluating the results (Zupic and Čater, 2015).

To conduct a thorough contemporary investigation, we cleaned numerous records using "titles, abstracts, and author-specified keywords". First, we conducted a keyword search and received 1,003 results. Then, after narrowing the subject area to a few areas, we obtained 566 articles. After that, to ensure the quality of the document the search was limited to book chapters, conference papers, editorials, and articles that led to 525 articles. The screening done based on the English Language yielded 501 articles. The last two decades were taken as a time boundary which resulted in 497 articles. Finally, following the screening and removal of duplicate or erroneous records, we arrived at a final sample of 495 articles.

Technique for Analysis

Bibliometrics has become a legitimate method to handle large bibliographic datasets and minimize any potential bias. Bibliometric analysis also helps to shed light on emerging areas in a particular field (Donthu et al., 2021). The technique not only allows researchers to uncover new information from literature but also helps detect patterns in research work. Methodologies like co-citation, co-word analysis, bibliographic coupling, citation analysis, and co-authorship analysis are used in bibliographic analysis (Donthu et al., 2021; Gao et al., 2021; Mishra et al., 2018). The two parts of Bibliometric analysis comprise performance analysis and Science mapping. Performance analysis assesses the contribution made by various research elements (e.g., authors, journals, countries) and identifies the most influential ones. Science mapping deals with citation, co-citation, co-authorship, and keyword co-occurrence with the bibliographic coupling tool (Donthu et al., 2021; Lucey et al., 2023). This study uses performance analysis and science mapping to explore the intellectual information present in literature regarding the relationship between Fintech and financial fraud.

Findings

Publication Trend

Figure 1 depicts the annual publication trend of research papers on Fintech and financial fraud. The trend indicates that relatively little research was published from 2013 to 2017. A significant increase in publications began in 2018. Since then, it has been an increasing trend for publication as this topic is gaining

popularity because many frauds and activities are occurring in the financial sector continuously (Lucey et al., 2023). The year 2022 is the most productive as maximum research has been done in this year relating to financial frauds and Fintech. As of August 2023, 71 publications have already been published, and the number is expected to continue growing in the coming years.

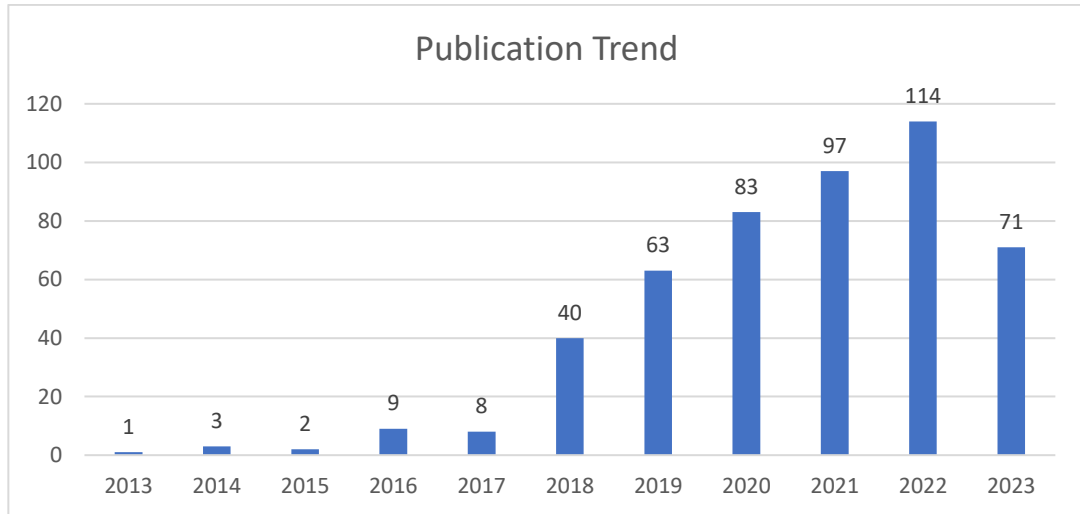


Figure 1. Financial Fraud and Fintech Research Publication Trend

Source: Research finding.

Prolific Contributors, Institutions, and Countries for Financial Fraud and Fintech

Table 2 presents the prolific authors, countries, and organizations that have conducted research on Fintech and financial fraud. Chen Y is the most influential author with 245 citations, followed by Million et al. (179 citations) and Bartoletti et al. (162 citations). The most popular country in terms of writing papers on the theme of Fintech and financial fraud is the United States (US) with 1134 citations followed by the United Kingdom (UK) with 756 citations. The US and UK have published various articles (81 and 61 respectively) on the theme of financial fraud in the digital world. The most crucial contribution to the studies is given by the School of Business in the US with 245 citations. The University of São Paulo, Brazil, and the University of Cagliari, Italy have also made significant contributions, with 179 and 162 citations, respectively.

Table 2. Most Prolific Authors, Institutions, and Countries

TC	Authors	TP	TC	Country	TP	TC	Organization	TP
245	Chen	1	1134	United States	81	245	School of business, Stevens institute of technology, US	1
179	Miliane, Spinolam, & Carvalhom	1	756	United Kingdom	61	179	University of Saopaulo, Brazil	1
162	Bartoletti, Pes, & Serusi	1	618	China	45	162	University of Cagliari, Cagliari, Italy	1
134	Caic	1	550	Germany	42	134	Charles Sturt University, Melbourne, Australia	1
113	Zhu and Zhouz	1	512	Italy	30	113	Shanghai Jiao Tong University, Shanghai, China	1
93	Cummingd, Leboeuf, & Schwienbacher	1	447	France	22	93	Skema Business School & Universit�lille 2, France	1
90	Langley and Leyshon	1	425	Australia	21	93	Skema Business School, Department of Finance and Accounting, France	1
87	Bollaert, Lopez-De-Silanes, and Schwienbacher	1	392	Netherlands	21	93	York University, Ontario, Canada	1
77	Huang, Meoli, & Vismara	1	346	Canada	12	90	Durham University, UK	1
77	Liu, Li, & Wang	1	209	Spain	12	90	University of Nottingham, United Kingdom	1

73	Martínez-Climent, Zorio-Grima, & Ribeiro-Soriano	1	206	India	33	87	University Côté'd'azur, France	1
70	Block, Groh, Hornuf, Vanacker, & Vismara	1	202	Belgium	9	77	Beijing University of Chemical Technology, China	1
70	Campbell-Verduyn	1	198	Brazil	5	77	University of Bergamo, Via Pasubio 7b, Dalmine, Italy	1
69	Kamps and Kleinberg	1	156	Taiwan	8	77	University Of Bath, Claverton Down, United Kingdom	1
69	Momtaz	1	141	Hongkong	10	77	University Of Ghent, Ghent, Belgium	1

Source: Research finding.

Note: TC = Total citation; TP = Total Publication.

Most Influential Journals for Research in Fintech and Financial Fraud

Table 3 depicts the list of journals that have published the most articles in the field of Fintech and financial fraud. As shown in the table, the *Journal of Technological Forecasting and Social Change* has received the highest number of citations (307) with 13 publications in this area. Also, it can be observed that the *Journal of Money Laundering Control* has 23 publications in this area with 172 citations. Most of the research has been published from 2018 onwards. Many articles have been published in the years band of 2021 to 2023. This has happened because the fraud landscape for the Fintech industry has increased over the past few years, certainly during the time of COVID-19 (Saluja et al., 2021). Researchers in this field are advised to consider the *Journal of Money Laundering Control* and the *Journal of Technological Forecasting and Social Change* for publication.

Table 3. Top Journals on Fintech and Financial Fraud

Journals	TC	TP	Fin	2013-2015	2016-2017	2018-2020	2021-2023
Technological forecasting and social change	307	13		0	0	4	9
Business horizons	245	1		0	0	1	0
Electronic commerce research and applications	236	4		0	0	2	2
Financial innovation	175	6	x	0	1	0	5
Journal of Money Laundering Control	172	23	x	0	1	8	14
Proceedings - 2018 crypto valley conference on blockchain technology, cvcvt 2018	162	1	x	0	0	1	0
Small business economics	147	2		0	0	1	1
Accounting and finance	140	3	x	0	0	1	2
Journal of Financial Crime	134	8	x	1	0	2	5
Ieee transactions on engineering management	127	5		0	0	2	3
Research policy	116	2		0	0	2	0
European Business Organization Law Review	101	5		0	0	3	2

Computer law and security review	100	4	0	1	1	2
Crime science	97	2	0	0	1	1
Energy Economics	93	1	0	1	0	0

Source: Research finding.

Note: TC = total citations, TP = total number of article(s) publications, FIN = X if a journal is classified as 'Finance' by the 2018 Academic Journal Guide.

Most Influential Articles on Fintech and Financial Fraud

Table 4 presents the most influential and impactful articles in the domain of financial fraud and financial technology. With 245 citations, the article "Blockchain Tokens and the Potential Democratization of Entrepreneurship and Innovation" by Chen (2018) is the most influential research in this area. This paper has highlighted the importance of blockchain which has emerged as the first decentralized, global currency. The authors focused on how blockchain technology has started to revolutionize entrepreneurship and innovation. They discovered that blockchain technology has allowed innovators to create digital tokens to represent scarce assets. With 179 citations, Milian et al. (2019) conducted an impactful study titled "Fintech: A literature review and research agenda" to showcase the crucial need for financial technology.

Table 4. Top Articles on Financial Fraud and Fintech in Finance (Most Influential Article)

Articles	Title	TC
Chen (2018)	Blockchain tokens and the potential democratization of entrepreneurship and innovation	245
Milian et al. (2019)	Fintechs: A literature review and research agenda	179
Bartoletti et al. (2018)	Data mining for detecting Bitcoin Ponzi schemes	162
Cai (2018)	Disruption of financial intermediation by Fintech: a review on crowdfunding and blockchain	134
Zhu and Zhou (2016)	Analysis and outlook of applications of blockchain technology to equity crowdfunding in China	113
Cumming et al. (2017)	Crowdfunding cleantech	93
Langley and Leyshon (2017)	Capitalizing on the crowd: The monetary and financial ecologies of crowdfunding	90
Bollaert et al. (2021)	Fintech and access to finance	87
Huang et al. (2020)	The geography of initial coin offerings	77
Liu et al. (2020)	What have we learned from 10 years of Fintech research? A scientometric analysis	77

Martínez-climent et al. (2018)	Financial return crowdfunding: literature review and bibliometric analysis	73
Campbell-verduyn (2018)	Bitcoin, crypto-coins, and global anti-money laundering governance	70
Block et al. (2021)	The entrepreneurial finance markets of the future: a comparison of crowdfunding and initial coin offerings	70
Kamps and Kleinberg (2018)	To the moon: defining and detecting cryptocurrency pump-and-dumps	69
Mumtaz (2021)	Entrepreneurial Finance and Moral Hazard: Evidence from Token Offerings	69

Source: Research finding.

Top References for Financial Frauds and Fintech Research Area of Finance

Table 5 shows the top references in the research on financial technology and financial fraud based on local and global citations. The book chapter authored by Beck (2016) titled “Introduction – Crowdfunding in Europe” is a top reference with 6 local citations and 3 global citations. This represents a ratio of local to global citations of 200%. The objective of the study is to understand the growing occurrence of crowdfunding, its sparks, and its stimulus. This is an introductory chapter in the book *Crowdfunding in Europe* that emphasizes the relevance of crowdfunding for research, society, and the economy. In this manner, it explores ways to strengthen the economy and optimize the use of resources. The study by Bartoletti (2018) titled “Data mining for detecting Bitcoin Ponzi schemes” is the second most referenced, with 3 local citations (LC) and 162 global citations (GC), resulting in an LC-to-GC ratio of approximately 1.85%. This paper has focussed on a scam called the Ponzi scheme that operates on Bitcoin. Data mining techniques have been deployed to find out the Bitcoin addresses of Ponzi Schemes. Various machine learning algorithms have been experimented with, and their effectiveness has been assessed through performance metrics and standard validation protocols.

Table 5. Top References in the Area of Financial Fraud and Fintech in Finance

LC	Authors	Title	GC	LC/GC (%)
6	Beck (2016)	Introduction-Crowdfunding in Europe	3	200.00
3	Bartoletti (2018)	Data mining for detecting Bitcoin Ponzi schemes	162	1.85
2	Pandey (2019)	Crowdfunding fraud prevention using blockchain	15	13.33
2	Alimoglu (2017)	Design of a smart contract-based autonomous organization for sustainable software	9	22.22
1	Bajwa (2022)	Past, Present and Future of Fintech Research: A Bibliometric Analysis	5	20.00
1	Patil (2021)	Blockchain-Based Crowdfunding Application	5	20.00
1	Lorenz (2020)	Machine learning methods to detect money laundering in the Bitcoin blockchain in the presence of label scarcity	23	4.35
1	Handke (2020)	Crowdfunding	1	100.00
1	Ferreira (2018)	Success Factors in a Reward and Equity-Based Crowdfunding Campaign	9	11.11
1	Charlotte (2019)	Measuring ICO Performance Indicators: An Empirical Study Via White Papers	6	16.67
0	Meiryani (2023)	Exploration of potential money laundering crimes with virtual currency facilities in Indonesia	0	
0	Cumming (2023)	Global Fintech trends and their impact on international business: a review	0	
0	Avci (2023)	Blockchain tokenization of real estate investment: a security token offering procedure and legal design proposal	0	
0	Berns (2022)	Crowdfunding success in sustainability-oriented projects: An exploratory examination of the crowdfunding of 3D printers.	2	0.00
0	Li (2023)	Internet Financial Fraud Detection Based on Graph Learning	1	0.00

Source: Research finding.

Note: LC – Local Citation, GC – Global Citation.

Knowledge Foundation of Financial Fraud and Fintech Research through Co-citation Analysis

Co-citation analysis reveals the semantic correlation of co-cited references, which represents the body of knowledge on a topic (Donthu et al., 2021). Figure 2 presents a reference map showing references that were cited at least 8 times across the articles in the review corpus. The works of Vismara, Gabor, Adhami, Buchak, Ahlers, and Fisch (green nodes) are cited in the context of digitized funding and other related aspects of Fintech. Mollick, Belleflamme, Lin, and Calic (red nodes) have made invaluable contributions cited in the areas of Fintech and sustainable innovation, decentralized applications, and various aspects of financial fraud. Nakamoto, Swan, Chen, Christidis, and Bruton (blue nodes) are highly cited for research on digital finance and financial fraud. Lin, Prabhala, Burtch, Viswana, and Wattal (yellow nodes) are also cited for work in some areas of Fintech and financial fraud.

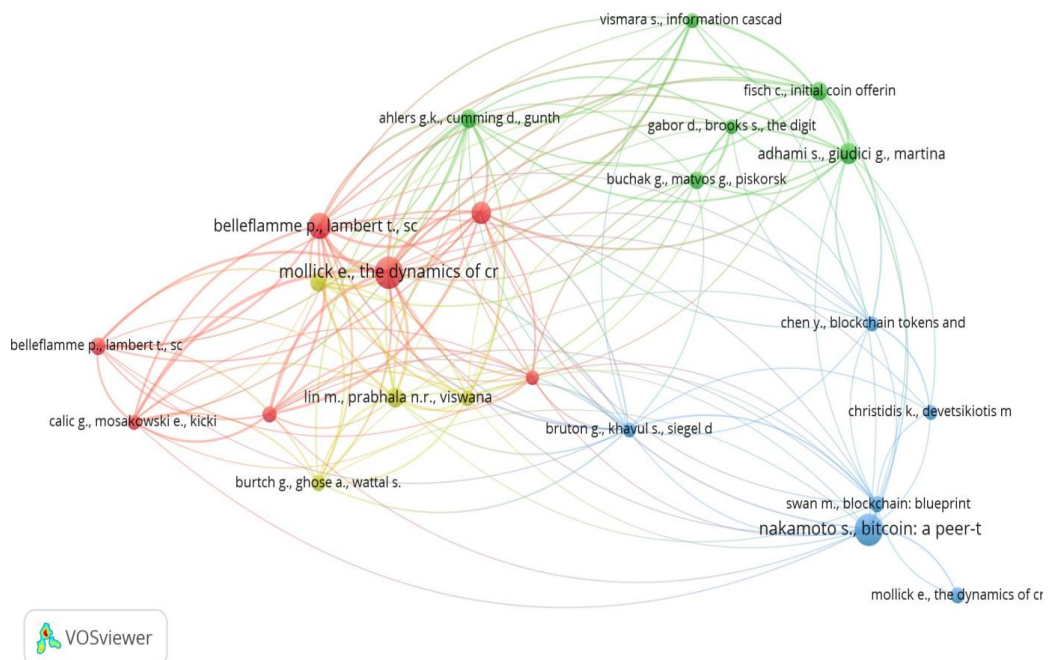


Figure 2. Co-citation of References Cited by Article on Fintech and Financial Fraud

Source: Research finding.

Thematic Structure Analysis through Bibliographic Coupling

Bibliographic coupling contributes to mapping the intellectual structure of a research area (Lucey et al., 2023), leading to the identification of thematic changes

within it (Crane, 1972). The bibliographic coupling analysis performed using VOSviewer segregated the 495 documents under study into several major thematic clusters and many minor groups. Five major clusters were retained in the study for further evaluation as the minor groups had less than ten papers. Table 6 presents the five major themes and the most influential articles from each cluster.

Cluster 1: Is Fintech a Moral Alternative to Fiat

The focus of this cluster is to explore alternatives to fiat currency in Fintech. The focus area involves crowdfunding and initial coin offering (ICO), which can emerge as alternatives to traditional fiat provided by banks, institutional investors, and venture capitalists.

Langley and Leyshon (2017) examined the ‘disruptive’, ‘alternative’, and ‘democratizing’ features of crowdfunding. The paper not only argues that crowdfunding acts as an antidote to the oligopolistic nature of capital but also has a different ecological structure. Crowdfunding is described as a coalition of smaller ecologies (potentially diverse audiences) that change debt dynamics. These ecologies create funds for various purposes like donation, reward, equity, fixed income, and peer-to-peer lending. Lastly, crowdfunding is defined as a more democratized process because it allows anyone to finance projects, in contrast to financial intermediaries and banks that act as gatekeepers.

Similarly, Bollaert et al. (2021) highlighted the growing role of digitization as a source of finance. The paper pointed out the changing trend among traditional intermediaries like venture capitalists, who are themselves participating in crowdfunding and ICOs. The importance of ICOs and crowdfunding for small projects is revealed; however, until their scalability extends to large projects, their overall importance in alternative finance remains questionable.

Furthermore, Momtaz (2021) showed the presence of moral hazard in ICO trading. Investors face information asymmetries and are unable to identify biased signals about ICO quality; therefore, firms that portray an accurate picture gain a competitive advantage. ICOs can send biased signals because there is a lack of penalizing agencies. To build trust in ICOs, the introduction of an underwriter is suggested.

Cluster 2: Fintech Technologies and Trust

This cluster relates to trust issues associated with Fintech technologies. Fintech technologies lack accountability for their social, ethical, political, or economic

implications. Fraudulent ICOs, crypto pump-and-dump schemes, and the role of Fintech in money laundering are included in this section.

Campbell-Verduyn (2018) discusses the money laundering potential of CCs, which attracts the attention of several stakeholders. Due to their quasi-anonymity, they can be used by criminals who cannot be flagged, allowing funds to be transferred to recipients who cannot be traced. Online transactions are fast and cannot be stopped if suspected of money laundering. Moreover, in such cases, the money can be withdrawn in another country. Although the Financial Action Task Force (FATF) has provided a balanced approach to mitigating risks presented by CCs, governance gaps remain.

Similarly, Kamps and Kleinberg (2018) discussed the pump-and-dump schemes created by some groups in cryptocurrency trading. Newer and less-traded currencies are targeted more frequently. In a pump-and-dump strategy, positive news about a CC is circulated by fake IDs to temporarily increase the coin's value. As soon as the price rises due to high demand, the group sells the purchased coins and books profits.

Another study by Rehman et al. (2020) presents a comparison of various trust issues in the top ten CCs, including lack of technical understanding, absence of regulation, lack of insurance, insider trading, and pump-and-dump activity. Money held in CCs is not inheritable and non-recoverable in case of death. This money is used on the dark web by malicious actors, leading to trust issues for both users and governments.

Cluster 3: Fintech and Entrepreneurial Finance

This cluster presents a discussion on market development, functioning, geography, and the emergence of new entrepreneurial finance.

Huang et al. (2020) revealed the geography of ICOs by studying 915 ICOs from 187 United Nations member states. Digital coins can be created by a company and easily traded among investors. The results of a binomial regression showed that countries with developed financial markets, advanced digital technology, and crowdfunding platforms are more likely to see the emergence of ICOs.

Another study by Martínez-Climent et al. (2018) conducted a bibliometric analysis of crowdfunding, finding that countries such as the USA, Germany, and Belgium published the most articles in this area. Due to the growing popularity of crowdfunding, accounting practices related to proper disclosure and risk assessment for crowdfunding firms are also gaining attention.

Furthermore, Block et al. (2021b) presented a comparison between ICOs and crowdfunding. Although both are crowd-based, they differ in terms of the role played by platforms and backers' motivation to invest. On one hand, reward-based crowdfunding, equity-based crowdfunding, and security ICO showed a low rate of fraud; on the other hand, utility-based funding showed a high fraud rate. The paper raises several research questions related to market regulation, stakeholders, and the emergence and development of both ICOs and crowdfunding.

Cluster 4: Fintech a Potential Threat or Sustainable Finance

This cluster discusses the similarities, convergence patterns, strengths, and weaknesses of Fintech and traditional finance, even though their business models differ.

Sangwan et al. (2020) conducted a systematic literature review on Fintech, focusing on a digital finance cube. On one end of the cube are various kinds of services offered in Fintech, and on the other end are technological advancements like Blockchain and Cryptocurrency. The third dimension of the cube comprises Fintech companies and service providers. The lending provided by Fintech captures areas that are not adequately served by banks, such as SME lending. The paper claims Fintech is at a nascent stage. Although Fintech has changed investment patterns and capital-raising methods, it has also led to an increase in systematic and unsystematic risks, necessitating regulatory oversight.

Similarly, Moro-Visconti et al. (2020) compared banks and Fintech firms that provide finance to unbanked populations. They compared banks and Fintech firms included in their pilot study based on various financial parameters like EBITDA (earnings before interest, tax, depreciation, and amortization), EV (enterprise value), price-to-book value, WACC (weighted average cost of capital), and several others. The findings highlight the sustainable implications of Fintech, showing its potential to mobilize green finance for poor people around the world.

Moreover, Omarova (2019) argued that Fintech empowers individuals and private parties by making transactions easier, faster, and cheaper. She advised adopting an informed perspective so that exposure to the risks posed by Fintech applications like cryptocurrencies, crowdfunding, and distributed ledger technology can be mitigated, and the positive aspects of Fintech can be harnessed.

Cluster 5: Fintech and Money Laundering

van Wegberg et al. (2018) is the most significant paper in this cluster, focusing on real-time experiments conducted on the role of Bitcoin in money laundering.

Weapons and drugs are bought and sold using Bitcoin as a payment method. The dark web provides two services for money laundering: Bitcoin mixing and Bitcoin exchange. Mixing services enhance the anonymity of Bitcoin addresses, whereas Bitcoin exchanges convert them into spendable money. Bitcoin exchanges provide cash-out services via PayPal or Western Union because bank account transactions can be traced. However, with Western Union, funds must be collected from a physical office, which reduces anonymity. Service providers on the dark web are partly scams and partly operational, so users must consult reviews before engaging with them.

Similarly, Albrecht et al. (2019) discussed the role of cryptocurrency in the money laundering process in a theoretical paper. The paper confirms that the anonymity feature of cryptocurrencies makes them prominent money laundering tools. Since cryptocurrency bypasses the banking system, tax evasion becomes easier with its use. Many countries like India and China discourage its use, while a country like Japan has rules and laws to regulate it.

Furthermore, Desmond et al. (2019), through a systematic literature review, argued that cryptocurrency money laundering differs from conventional methods because criminals are not constrained by geographic boundaries. The knowledge base related to cryptocurrency is insufficient; thus, regulators lack depth and breadth of understanding. Rasmussen's core tenet is used in the paper to study crypto laundering, proving it to be a complex social and technical system.

Table 6. Cluster in the Area of Financial Fraud and Fintech in Finance

Theme	Author	Title	TC
Fintech a Moral alternative to Fiat	Langley, P.; Leyshon, A. (2017)	Capitalizing on the crowd: The monetary and financial ecologies of crowdfunding	90
	Bollaert, H.; Lopez-de-Silanes, F.; Schwienbacher (2021)	Fintech and access to finance	87
	Momtaz, P. P. (2021)	Entrepreneurial Finance and Moral Hazard: Evidence from Token Offerings	69
Fintech Technologies and trust	Campbell-Verduyn, M. (2018)	Bitcoin, crypto-coins, and global anti-money laundering governance	70

	Kamps, J.; Kleinberg, B. (2018)	To the moon: defining and detecting cryptocurrency pump-and-dumps	69
	Rehman, M. H. U.; Salah, K.; Damiani, E.; Svetinovic, D. (2020)	Trust in Blockchain Cryptocurrency Ecosystem	49
	Huang, W.; Meoli, M.; Vismara, S. (2020)	The geography of initial coin offerings	77
Fintech an Entrepreneurial finance	MartÁnez-Climent, C.; Zorio- Grima, A.; Ribeiro-Soriano, D. (2018)	Financial return crowdfunding: literature review and bibliometric analysis	73
	Block, J. H.; Groh, A.; Hornuf, L.; Vanacker, T.; Vismara, S. (2021)	The entrepreneurial finance markets of the future: a comparison of crowdfunding and initial coin offerings	70
	Sangwan, V.; Harshita, Prakash, P.; Singh, S. (2020)	Financial technology: a review of extant literature	50
Is Fintech a potential threat or sustainable?	Moro-Visconti, R.; Rambaud, S.C.; Pascual, J. L. (2020)	Sustainability in Fintechs: An explanation through business model scalability and market valuation	42
	Omarova, S. T. (2019)	New tech v. new deal: Fintech as a systemic phenomenon	36
Fintech and money laundering	van Wegberg, R.; Oerlemans, J. -J.; van Deventer, O. (2018)	Bitcoin money laundering: mixed results: An explorative study on money laundering of cybercrime proceeds using bitcoin	50
	Albrecht, C.; Duffin, K. M.; Hawkins, S.; Morales Rocha, V. M. (2019)	The use of cryptocurrencies in the money laundering process	35

Desmond, D. B.; Lacey, D.; Salmon, P. (2019)	Evaluating cryptocurrency laundering as a complex socio- technical system: A systematic literature review	19
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Source: Research finding.

Thematic Trends of Fintech and Financial Frauds

Thematic tendencies in research on Fintech and financial fraud are further analyzed using co-occurrence analysis. Thematic trends are further explored through the foundational insights provided by co-citation analysis and bibliographic coupling. Author keywords were used for the co-occurrence analysis. The trends have been divided into three periods: Period 1 covers the years 2015–2017, Period 2 covers 2018–2020, and Period 3 covers 2021–2023. The evolution of these trends is depicted in Figures 3 to 6. All these figures show the progression of top topics and themes across these periods.

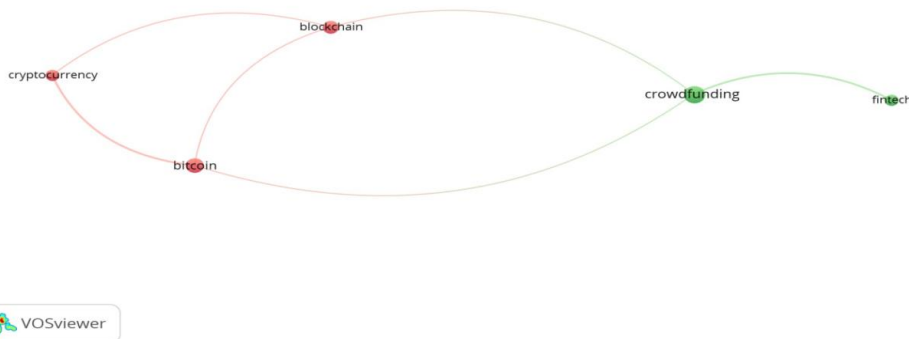


Figure 3. Effective Topic between 2015 and 2017

Source: Research finding.

Note: Red Nodes- Blockchain and currency, Green Nodes – Fintech and crowdfunding.

The study period of 2015–2017, as shown in Figure 3, placed emphasis on topics like crowdfunding and Fintech (green nodes) and other methods like Bitcoin, blockchain, and cryptocurrency. This period represents the initial phase of the emergence of financial technology.

entrepreneurial finance through blockchain-based technologies. After 2020, research accelerated in this field, and the focus shifted toward financial fraud and Fintech compliance by regulatory authorities.

Furthermore, future researchers can study the replacement of fiat currency by Fintech and its impact on the world economy. The increased presence of Fintech has created opportunities for firms unable to meet traditional bank requirements. A key question is whether it can also serve the needs of larger players.

Moreover, the use of disruptive technology is increasing, which has become a backbone of Fintech. Future research can explore possibilities for using AI and IoT for Fintech fraud detection.

Additionally, future studies can be conducted to stop money laundering through DLT. Future researchers can find alternatives for maintaining transparency while using blockchain-based Fintech. A method of record-keeping on money trails in DLT to trace culprits can also be a topic for future research. Further studies can be conducted on fraud white papers so that investors do not get trapped and lose their money.

Conclusion

As digital transformation has become a major disruptive force across all sectors, Fintech has emerged as a critical component for the financial sector. However, it has simultaneously created opportunities for activities that can lead to corruption within the financial sector. As new technologies and innovations continue to evolve, the potential for various forms of financial fraud is also increasing.

The present study has examined research trends, influential works, and thematic evolution in Fintech and financial fraud. The trends indicate that publications in financial technology have increased rapidly since 2018. We can see progression in publications during the years 2021-23 compared to earlier years. Similarly, we can see advancement in author keywords used during the late period indicating the role of financial technology and increased financial fraud. The research is mostly published in journals like *Financial Innovation*, *Journal of Money Laundering Control*, *Accounting and Finance*, and *Journal of Financial Crime*. Maximum research has come from universities in the United States, United Kingdom, China, and Germany. The analysis of keyword occurrence indicates that most topics explored by authors in recent years are related to blockchain technology, Fintech and entrepreneurial finance, crowdfunding, money laundering, and financial fraud. The scope of the current study is limited to a bibliometric analysis of bibliographic information obtained solely from the Scopus database. Since several high-caliber

articles are only listed in Scopus and Web of Science, future studies could be conducted using a merged bibliography combining both databases. To further comprehend the research paradigm from other publications, future studies may use bibliometric analysis on SCI, SSCI, and ABDC-listed articles exclusively.

Implication

The present study has several implications for academicians and scholars. They can gain insight into the existing literature in this area by identifying the prominent and influential contributors in this field. The challenges and gaps identified in this area suggest directions for future research. Furthermore, researchers in this area may identify high-impact journals to publish their articles.

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