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FinTech Research Mapping: A Citation-based Bibliometric Analysis

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ABSTRACT

This study presents a comprehensive bibliometric analysis of financial technology (FinTech) research using data sourced from the Dimensions.ai database. A total of 188 documents are analyzed through VOSviewer 1.6.20 to visualize co-authorship, citation, and institutional collaboration networks. The results reveal that China leads in total publications, while the United States records the highest average citations per article. Influential authors, such as Özili, and top journals, like Borsa Istanbul Review, significantly shape research themes, including digital financial inclusion, green finance, and AI-integrated financial systems. Thematic clusters and country-level collaboration patterns highlight strong international engagement and untapped research potential in regions such as South Asia and Africa. The findings provide direction for future FinTech research focused on ethical, technological, and policy-driven dimensions to foster inclusive and sustainable digital financial ecosystems.

1. Introduction

Financial technology (FinTech) has emerged as a transformative force in modern finance [1,2]. FinTech reshapes how individuals, businesses, and governments interact with financial services [3,4]. From mobile banking and digital wallets to blockchain-enabled smart contracts and robo-advisory platforms [5], FinTech applications have streamlined transactions, reduced costs, and expanded financial inclusion [6,7]. Particularly in developing countries, FinTech has become a critical tool for reaching unbanked populations and fostering micro-entrepreneurship [8,9].

The importance of FinTech lies in its ability to democratize access to finance [10], enhance transparency [11], and accelerate economic growth through digital innovation [12]. However, alongside its benefits, FinTech presents significant challenges ranging from cybersecurity threats, regulatory uncertainty, and privacy concerns to algorithmic bias and digital illiteracy among vulnera-

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ble populations [13]. These complexities make it essential to understand how research around FinTech is evolving globally.

While several literature reviews exist, most rely on keyword-based bibliometric methods using databases like Scopus or Web of Science. This study addresses a critical gap by adopting a citation-focused bibliometric analysis using Dimensions.ai [14], which, despite lacking keyword metadata, offers rich citation data for mapping intellectual networks [15]. Using VOSviewer, we visualize the structure of FinTech scholarship through bibliographic coupling of documents, authors, sources, institutions, and countries. The study aims to reveal thematic clusters, identify key contributors, and suggest future directions for FinTech research.

2. Data and Methodology

2.1 Data

The present study utilizes secondary data extracted from the Dimensions.ai database, a globally recognized research indexing platform [16]. The data collection period spanned from 2015 to 2025. A structured search query was used to gather relevant literature by combining keywords associated with financial technology and bibliometric studies. The specific query syntax is TITLE+ABS ("fintech" OR "financial technology" OR "digital finance") AND ("bibliometric" OR "literature review" OR "systematic review" OR "scientometric"). This search yielded a total of 2697 documents.

To ensure thematic relevance, only records related to commerce, management, and the tourism sector were retained, leading to a refined pool of 1370 articles. Studies from unrelated disciplines such as engineering, medicine, and pure sciences were excluded ($n = 1327$). Further filtering was applied to include only peer-reviewed journal articles, reducing the count to 1019 after excluding reviews, book chapters, and conference proceedings. Next, to maintain academic rigor, only articles indexed in the UGC-CARE Group II journal list were selected ($n = 502$).

A final filter was applied to retain only open access articles, ensuring wide visibility and accessibility, which yielded 188 articles. These constituted the final dataset for bibliometric and citation analysis (Figure 1).

2.2 Methodology

The research adopted a quantitative bibliometric approach to examine the evolution and impact of FinTech-related scholarly publications. The selected 188 Open Access articles were analyzed using VOSviewer, widely accepted software for visualizing bibliometric networks. This tool facilitated the identification of intellectual structures and collaborative patterns among authors, institutions, and countries. The study performed citation analysis across four dimensions:

- i. most prolific authors,
- ii. most cited countries,
- iii. leading organizations, and
- iv. top contributing journals.

Each of these parameters was evaluated based on citation thresholds and co-occurrence link strength. The visualization maps generated by VOSviewer were interpreted to highlight influential entities and emerging clusters within the FinTech research landscape. This method ensured an objective, data-driven understanding of the bibliographic ecosystem surrounding financial technology and digital finance studies.

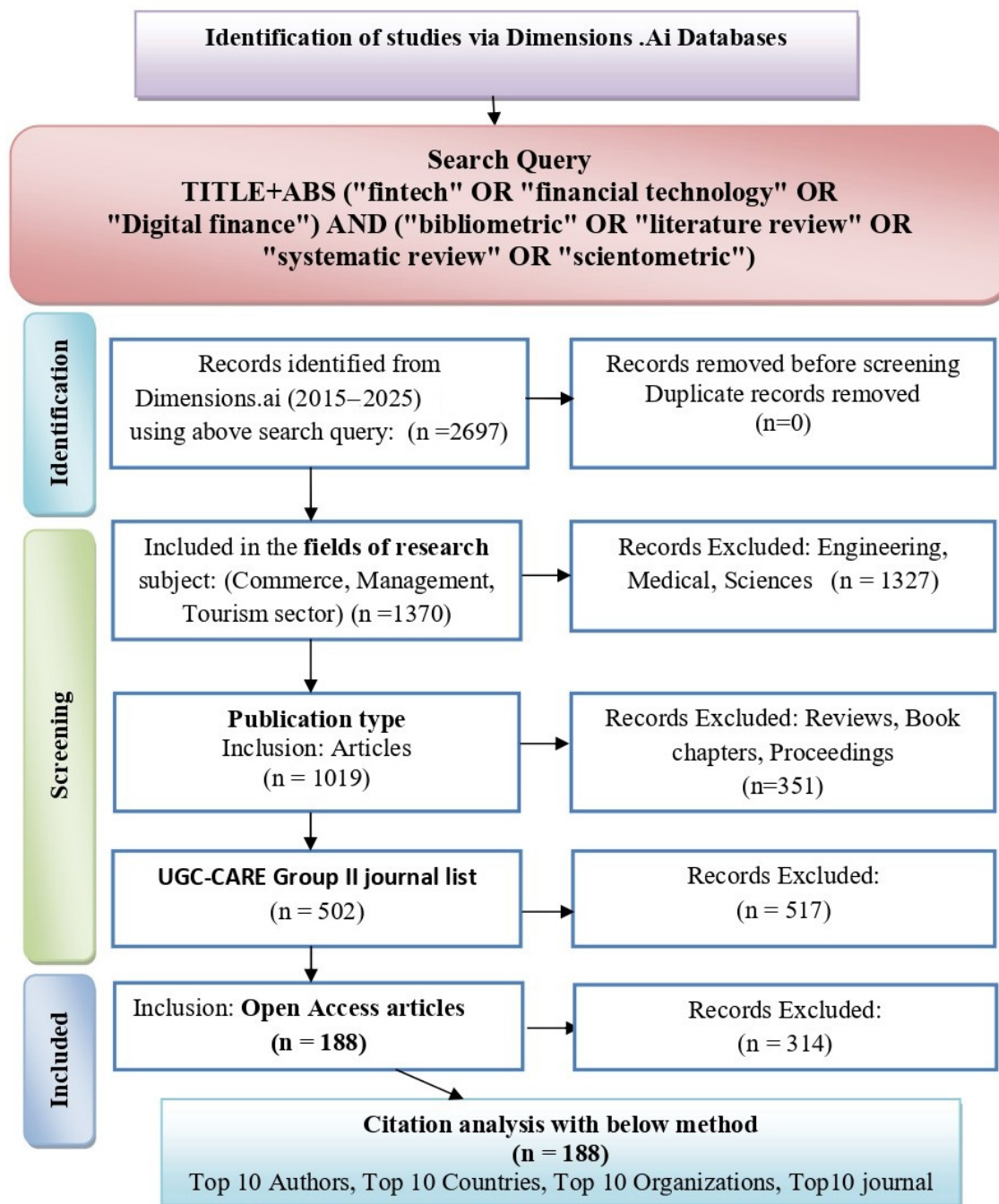


Fig. 1. PRISMA framework for data extraction

3. Results

3.1 Trend Analysis

The publication trend from 2015 to 2025 reflects a significant rise in research output and scholarly influence (Table 1). There were no publications from 2015 to 2017, with the first paper appearing in 2018. After a gap in 2019, a steady increase began in 2020 with four publications, rising to 14 in 2021, 31 in 2022, and peaking at 59 in 2023. A slight decline followed in 2024 with 57 publications, while 2025 records 22 publications.

Table 1

Publication and citation trend

Metric	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total publication	0	0	0	1	0	4	14	31	59	57	22
Total citation	1	0	0	7	20	82	183	522	1168	1969	783
≥1	0	0	0	1	0	4	13	31	57	37	8
≥10	0	0	0	1	0	2	13	24	26	7	0
≥25	0	0	0	1	0	0	11	16	11	1	0
≥50	0	0	0	1	0	0	9	5	4	0	0

Citations also increased notably from just one in 2015 to 1969 in 2024, demonstrating growing academic attention (Figure 2). In 2025, 783 citations were already recorded, indicating continued relevance. Publications with at least one citation rose alongside output, reaching 57 in 2023. High-impact publications (≥10 citations) peaked at 26 in 2023, while those with ≥50 citations were highest in 2021 at nine.

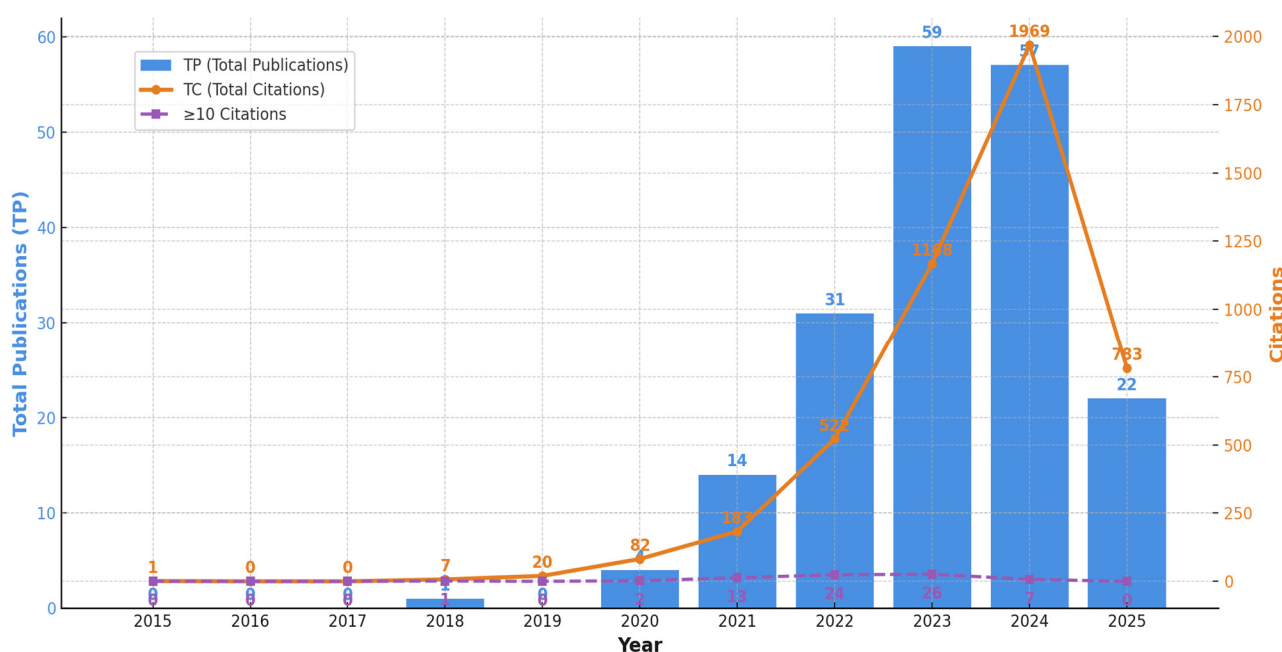


Fig. 2. Publication trends in the research area of commerce, management, and the tourism sector

3.2 Citations Analysis

3.2.1 Influential documents

Table 2 lists the top 10 FinTech documents. It reveals key themes and research trends driving scholarly attention. Ozili [17] remains foundational, widely cited for exploring digital financial inclusion and regulatory frameworks, especially in emerging economies. Recent highly cited works like Yue *et al.* [18] and Fu & Mishra [19] reflect growing interest in post-pandemic digital finance and resilience strategies. Articles by Lu *et al.* [20] and Buttice & Vismara [21] emphasize inclusive finance and SME empowerment, linking FinTech to economic development and equity access. New trends include green digital finance Zhao *et al.* [22], Islamic digital banking, and regional platform economies, showing a shift toward sustainability, ethical finance, and localized innovation. High average citations per year across these works confirm FinTech's status as a rapidly expanding interdisciplinary field, blending technology, finance, and development policy into impactful, globally relevant scholarship.

Table 2
Top 10 most influential FinTech documents

S.no.	Author(s)	Year	Title	Journal title	Time span in years	Total citation	Avg. citation per publication
1	Ozili [17]	2018	Impact of digital finance on financial inclusion and stability.	Borsa Istanbul Review	7	1279	182.7
2	Yue <i>et al.</i> [18]	2021	The rise of digital finance: Financial inclusion or debt trap?	Finance Research Letters	3	280	93.3
3	Fu & Mishra [19]	2021	Fintech in the time of COVID-19: Technological adoption during crises.	Journal of Financial Intermediation	4	178	44.5
4	Lu <i>et al.</i> [20]	2021	Local Bank, Digital Financial Inclusion and SME Financing Constraints: Empirical Evidence from China	Emerging Markets Finance and Trade	4	178	44.5
5	Butticè & Vismara [21]	2021	Inclusive digital finance: the industry of equity crowdfunding.	The Journal of Technology Transfer	4	115	28.8
6	Li <i>et al.</i> [23]	2022	Can digital finance promote urban innovation? Evidence from China	Borsa Istanbul Review	2	103	51.5
7	Banna & Alam [24]	2021	Impact of digital financial inclusion on ASEAN banking stability: implications for the post-Covid-19 era.	Studies in Economics and Finance	2	98	49.0
8	Zhao <i>et al.</i> [22]	2021	How Does Digital Finance Affect Carbon Emissions? Evidence from an Emerging Market.	Sustainability	2	88	44.0
9	Su <i>et al.</i> [25]	2021	Impact of E-Commerce Adoption on Farmers' Participation in the Digital Financial Market: Evidence from Rural China.	Journal of Theoretical and Applied Electronic Commerce Research	4	81	20.2
10	Jiang <i>et al.</i> [26]	2021	The Nexus between Digital Finance and Economic Development: Evidence from China	Sustainability	3	81	27.0

3.2.2 Productive and Influential Journals

Table 3 present that Sustainability is the most productive FinTech journal with 39 publications, while Borsa Istanbul Review is the most influential, leading with 1439 citations and the highest average citations per article (479.7). Finance Research Letters ranks high on both productivity and influence, showing strong impact per publication.

Table 3

Top 10 productive journals

Rank	Journal title	Total publications	Total citations	Avg. citation per publication
1	Sustainability	39	592	15.2
2	Environmental Science and Pollution Research	9	204	22.7
3	Finance Research Letters	4	283	70.8
4	Borsa Istanbul Review	3	1439	479.7
5	Journal of Risk and Financial Management	3	59	19.7
6	Technological Forecasting and Social Change	3	109	36.3
7	Scientific Reports	3	66	22.0
8	Heliyon	3	50	16.7
9	Information Systems Frontiers	3	71	23.7
10	Journal of Business Research	3	54	18.0

Table 4

Top 10 influential journals

Rank	Journal Title	Total publications	Total citations	Avg. citation per publication
1	Borsa Istanbul Review	3	1439	479.7
2	Sustainability	39	592	15.2
3	Finance Research Letters	4	283	70.8
4	Environmental Science and Pollution Research	9	204	22.7
5	Emerging Markets Finance and Trade	1	178	178.0
6	Journal of Financial Intermediation	1	178	178.0
7	The Journal of Technology Transfer	1	115	115.0
8	Technological Forecasting and Social Change	3	109	36.3
9	Journal of Cleaner Production	1	96	96.0
10	Journal of Islamic Accounting and Business Research	2	92	46.0

Sustainability emerges as the most central and productive journal, reflecting its strong interdisciplinary role in linking FinTech with environmental and social dimensions (Figure 3). Closely connected sources like PLOS ONE and Heliyon support open-access, cross-disciplinary research. Finance Research Letters and Environmental Science and Pollution Research appear as key hubs connecting themes like green finance and digital innovation. Borsa Istanbul Review, central to the blue cluster, leads policy and regulatory discussions, connecting with journals such as Eurasian Economic Review and Journal of Financial Regulation.

The map in Figure 3 reveals a diverse yet integrated scholarly ecosystem, where core journals drive influence and emerging clusters contribute to the evolving landscape of FinTech, sustainability, and regulatory studies. In Figure 3, out of 82 sources analyzed, 44 meet the threshold of at least 10 citations and a minimum of one document per source.

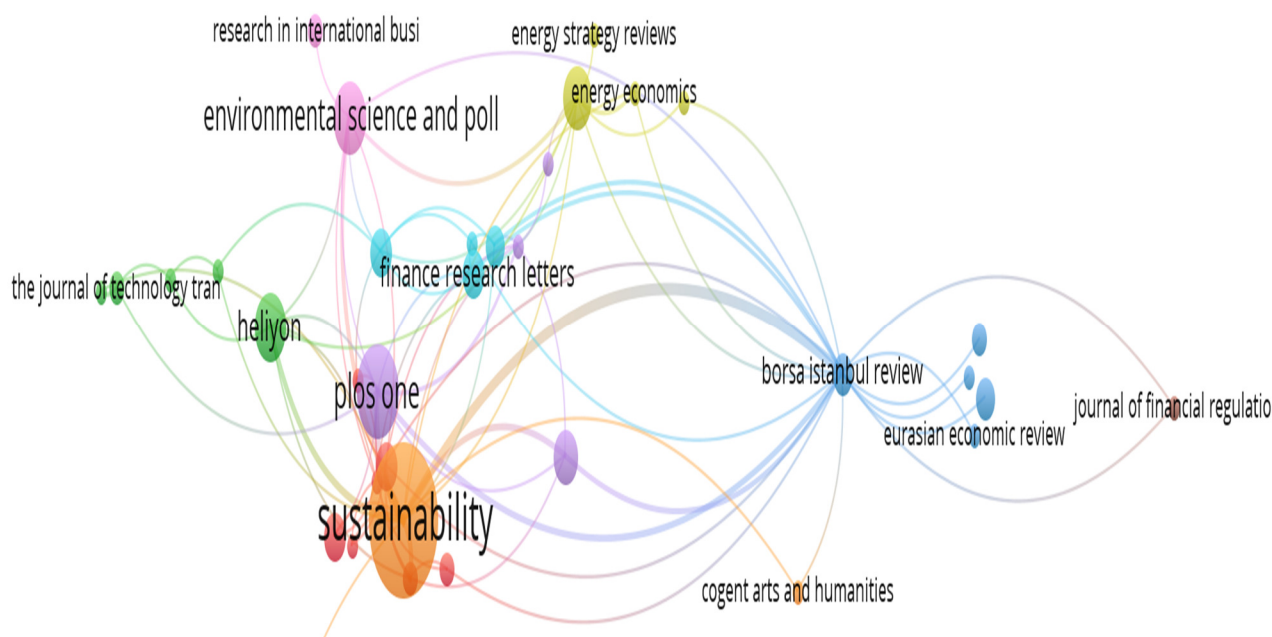


Fig. 3. VOSviewer-based citation network of FinTech sources.

Borsa Istanbul Review emerges as the most dominant and central journal, heavily cited and linked across disciplines, particularly in regulatory and policy-focused research (Figure 4). The blue cluster highlights its connections to sources like the Journal of Financial Regulation and Eurasian Economic Review, emphasizing its leadership in institutional finance. In contrast, Sustainability forms the core of the orange cluster, reflecting its strong role in interdisciplinary research connecting FinTech with environmental, social, and ethical finance. Journals such as Finance Research Letters, Environmental Science and Pollution Research, and Heliyon bridge multiple clusters, highlighting their versatility in themes ranging from innovation to impact assessment. The presence of sources like The Journal of Technology Transfer and PLOS ONE indicates the network's integration of technology, innovation, and open-access science, making FinTech a highly interconnected and evolving research field.

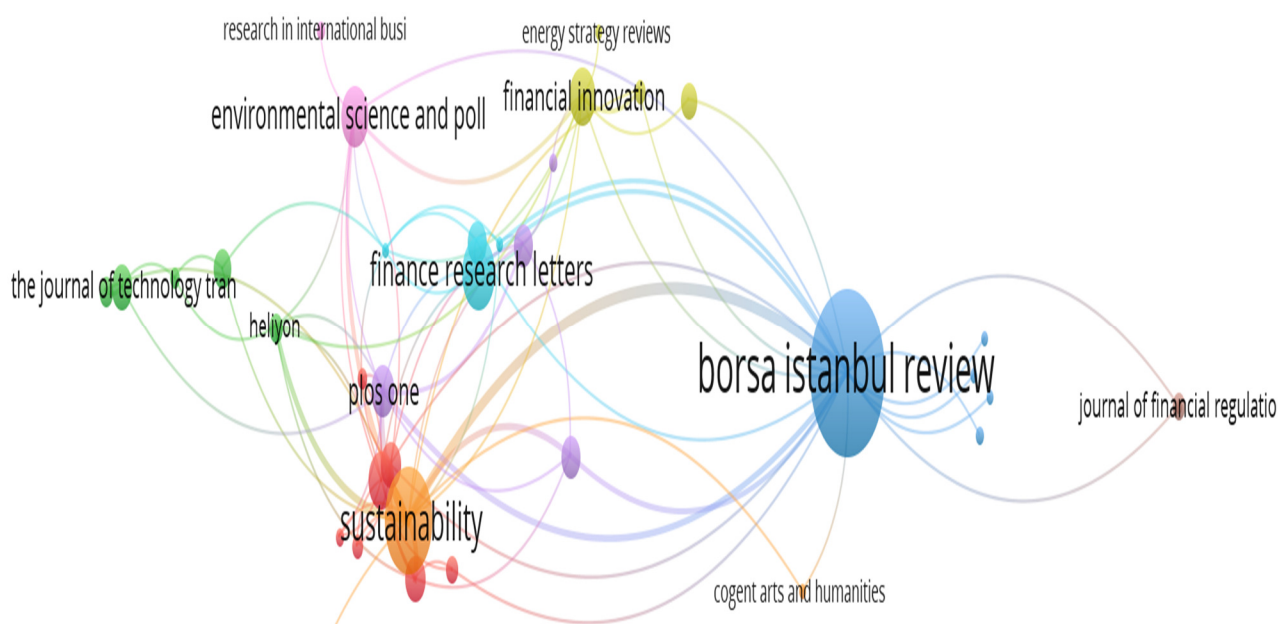


Fig. 4. VOSviewer-based citation network of FinTech cited sources

3.2.3 Authors

Ozili, Peterson K. leads FinTech research with two documents and 1294 citations (Table 5) reflecting his foundational impact on financial inclusion and policy. Yue, Korkmaz, Zhou, and Yin each have one document with 280 citations, indicating high-impact collaborative work. Lu Zhiqiang, Li Hongyu, and Wu Junjie each contributed two documents and shared 183 citations, highlighting strong co-authorship in regional studies. Nguyen and Mishra also authored one document each with 178 citations, focusing on innovation and digital finance.

Table 5

Top 10 authors in FinTech research

Rank	Author	Total publications	Total citations	Total link strengths
1	Ozili, Peterson K.	2	1294	62
2	Yue, Pengpeng	1	280	8
3	Korkmaz, Aslihan Gizem	1	280	8
4	Zhou, Haigang	1	280	8
5	Yin, Zhichao	1	280	8
6	Lu, Zhiqiang	2	183	32
7	Li, Hongyu	2	183	32
8	Wu, Junjie	2	183	32
9	Nguyen, Duc Khuong	1	178	29
10	Mishra, Mrinal	1	178	0

The author citation network in FinTech research reveals five distinct clusters, each representing unique thematic and collaborative dimensions (Figure 5). Cluster 1 is led by Ozili, Peterson K., the most cited and interconnected author, whose extensive work focuses on digital financial inclusion, regulatory reforms, and socio-economic development. His centrality is supported by authors like Yang Xiaoli and Yao Lianying, who further explore governance and institutional transformation in developing economies.

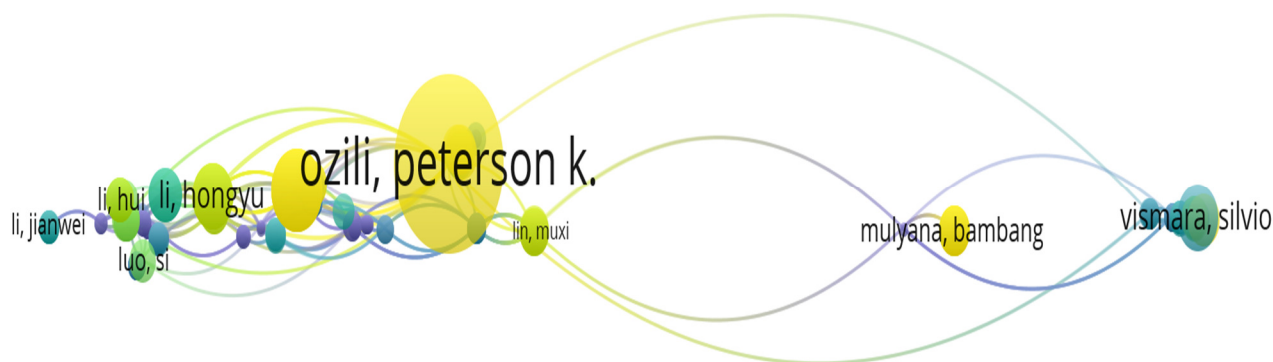


Fig. 5. Author overlay visualization generated using VOSviewer

Cluster 2 in Figure 5 includes Silvio Vismara and Frimpong, Stephanie, whose contributions center on FinTech platforms, equity crowdfunding, and SME financing, highlighting the intersection of finance innovation and entrepreneurship. Cluster 3, formed by Zhao Hui and Luo Si, focuses on green digital finance and sustainable development, aligning FinTech with ESG goals and policy transitions. In Cluster 4, Chinese scholars such as Li Hongyu and Wu Junjie dominate with strong co-authorship ties, researching regional digital ecosystems, user adoption, and infrastructure readiness. Cluster 5, with authors like Xin Daleng and Tian Ying, addresses AI integration, behavioral finance, and experimental digital tools. In Figure 5, out of 555 FinTech-related authors, 233 meet the threshold of having at least one publication and a minimum of 10 citations.

3.2.4 Institutions

Table 6 analysis of the top 10 most productive institutions in FinTech research highlights a balance between publication volume and research impact. Shandong University and Wuhan University lead in output, with Wuhan achieving a high average citation count (total link strengths of 48.40), reflecting notable influence. Although publishing fewer papers, the University of Essex stands out with the highest average citations (total link strengths of 642.50), indicating exceptional scholarly impact.

Table 6

Top 10 productive institutions in the FinTech research

Rank	Institution	Total publications	Total citations	Total link strengths
1	Shandong University	5	52	10.4
2	Wuhan University	5	242	48.4
3	Jiangsu University	4	43	10.8
4	University of Bergamo	4	178	44.5
5	Capital University of Economics and Business	3	285	95.0
6	Chongqing Technology and Business University	3	26	8.7
7	Tongji University	3	129	43.0
8	Nankai University	3	25	8.3
9	Zhejiang University of Technology	2	183	91.5
10	University of Essex	2	1285	642.5

Institutions like Capital University of Economics and Business and Zhejiang University of Technology also show strong performance. This demonstrates that both productivity and citation quality contribute significantly to institutional recognition in FinTech scholarship (Figure 6). In Figure 6, out of 312 institutions analyzed, 145 meet the threshold of having at least one publication and a minimum of 10 citations.

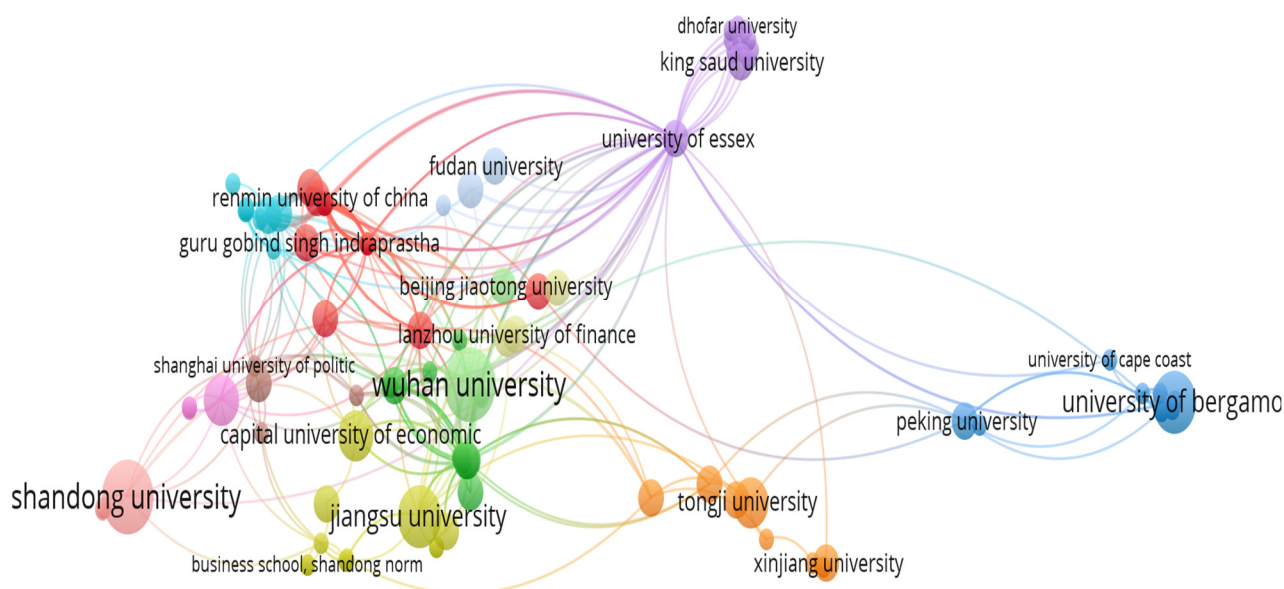


Fig. 6. Network visualization of institutions using VOSviewer.

3.2.5 Countries

The analysis of the top 10 countries in FinTech research highlights both productivity and scholarly impact (Table 7). China leads with the highest number of publications (i.e. 98), reflecting its growing academic focus on digital finance. However, the United States, despite fewer documents, records the

highest impact with an impressive average of 428 citations per publication, driven by landmark studies.

Table 7

Top 10 productive countries in the FinTech research

Rank	Country	Total publications	Total citations	Total link strengths
1	China	98	1394	14.2
2	China; United States (collab)	7	476	68.0
3	India	6	60	10.0
4	Italy	4	175	43.8
5	South Africa	3	21	7.0
6	Saudi Arabia	3	45	15.0
7	United States	3	1285	428.3
8	United Kingdom	2	240	120.0
9	Australia	2	88	44.0
10	Germany	2	53	26.5

Collaborative publications between China and the U.S. also demonstrate strong citation influence. Countries like the United Kingdom and Italy show high-quality research despite modest output. This reveals that while publication volume is crucial, international collaboration and research depth significantly enhance visibility and influence in FinTech scholarship (Figure 7).



Fig. 7. Country-wise collaboration network in FinTech research visualized using VOSviewer

4. Future Research

Based on the comprehensive bibliometric analysis, future FinTech research should focus on regional diversity, emerging technologies, and cross-national comparisons. Countries like China, the United States, the United Kingdom, and India have emerged as dominant contributors, indicating a need to examine their distinct regulatory strategies and collaborative frameworks. Thematic clusters emphasize growing interest in digital financial inclusion, sustainable finance, and institutional innovation. High-impact works also reveal an increasing shift toward AI, blockchain, and decentralized systems. These trends suggest further investigation into ethical governance, transparency, and digital trust. With rising publication volumes in recent years, longitudinal studies on the evolution of FinTech post-pandemic are essential. Regional ecosystems, particularly in South Asia, the Middle East, and Africa, remain underexplored and offer valuable insights into local adoption behavior and infrastructural readiness. Finally, deeper analysis is needed on the

effectiveness of institutional partnerships and policy diffusion, ensuring that technological advancement is inclusive, secure, and globally responsive.

5. Conclusions

The findings highlighted a rapid increase in FinTech research output, especially between 2021 and 2023, with China emerged as the most productive contributor and the United States exhibited the highest average citation impact. Prominent journals such as *Borsa Istanbul Review* laid the groundwork for ongoing academic inquiry into digital financial inclusion and regulatory innovation. Institutions like the University of Essex and Wuhan University demonstrated strong scholarly engagement. Citation and co-authorship networks revealed the growing influence of themes such as green finance, platform-driven innovation, and AI-integrated financial systems. Regional collaborations, particularly between China, India, and the U.S., indicated dynamic knowledge exchange, though areas like Africa and South Asia remained underrepresented.

In conclusion, FinTech research is transitioning from foundational studies to more diversified, application-driven inquiries. To ensure balanced growth, future research must deepen its focus on underexplored regions and expand engagement with ethical, technological, and infrastructural challenges. Comparative policy analysis, trust in digital systems, and interdisciplinary collaboration will be vital in shaping an inclusive and secure financial future. The scholarly community must also evaluate the long-term impact of institutional partnerships and regulatory diffusion to foster sustainable and globally responsive FinTech ecosystems.

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Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Raj, B., & Upadhyay, V. (2020). Role of FinTech in Accelerating Financial Inclusion in India. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3591018>.
- [2] Zhou, W. (2024). *The Transformative Impact of FinTech on Financial Services: A Comprehensive Analysis*. *Www.atlantis-Press.com*; Atlantis Press. https://doi.org/10.2991/978-94-6463-368-9_12.
- [3] Nichkassova, Y., & Shmarlouskaya, H. (2020). Financial technologies as a driving force for business model transformation in the banking sector. *International Journal of Business and Globalisation*, 25(4), 419. <https://doi.org/10.1504/ijbg.2020.10031311>.
- [4] Kistanti, N. R., & Putri, P. I. (2020). Financial Literacy of the Banking Sector in Micro and Small Business in Semarang. *KnE Social Sciences*, 1139-1147. <https://doi.org/10.18502/kss.v4i6.6667>.
- [5] Kumar, R. (2025). Bibliometric Analysis: Comprehensive Insights into Tools, Techniques, Applications, and Solutions for Research Excellence. *Spectrum of Engineering and Management Sciences*, 3(1), 45-62. <https://doi.org/10.31181/sems31202535k>.
- [6] Haridh, I. (2022). Language Barriers as a Limitation to Achieving Financial Inclusion Through FinTech in India. *Journal of Student Research*, 11(4). <https://doi.org/10.47611/jsrhs.v11i4.3198>.
- [7] Arner, D. W., Buckley, R. P., & Zetsche, D. A. (2018). Fintech for Financial Inclusion: A Framework for Digital Financial Transformation. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3245287>.
- [8] Varghese, G., & Viswanathan, L. (2018). Financial Inclusion: Opportunities, Issues and Challenges. *Theoretical Economics Letters*, 8(11), 1935-1942. <https://doi.org/10.4236/tel.2018.811126>.
- [9] Arslan, A., Buchanan, B. G., Kamara, S., & Al Nabulsi, N. (2021). Fintech, base of the pyramid entrepreneurs and social value creation. *Journal of Small Business and Enterprise Development*. <https://doi.org/10.1108/jsbed-10-2020-0370>.
- [10] Pandeirot, L. B., & Aseng, A. C. (2024). Closing the Gap between Financial Literacy and Financial Inclusion. *Jurnal Informatika Ekonomi Bisnis*, 443-447. <https://doi.org/10.37034/infkeb.v6i2.877>.

- [11] Salampasis, D., & Mention, A.-L. (2018). FinTech: Harnessing Innovation for Financial Inclusion. *Handbook of Blockchain, Digital Finance, and Inclusion*, 2, 451-461. <https://doi.org/10.1016/b978-0-12-812282-2.00018-8>.
- [12] Li, H. (2023). Digital inclusive finance, agricultural green technology innovation and agricultural carbon emissions: Impact mechanism and empirical test. *PLOS ONE*, 18(10), e0288072–e0288072. <https://doi.org/10.1371/journal.pone.0288072>.
- [13] Kumar, R. (2024). Global Trends and Research Patterns in Financial Literacy and Behavior: A Bibliometric Analysis. *Management Science Advances*, 2(1), 1-18. <https://doi.org/10.31181/msa2120256>.
- [14] Kumar, R. (2024). A Comprehensive Review of MCDM Methods, Applications, and Emerging Trends. *Decision Making Advances*, 3(1), 185-199. <https://doi.org/10.31181/dma31202569>.
- [15] Kumar, R. (2024). Multi-Criteria Decision-Making Applications in Agro-based Industries for Economic Development: An Overview of Global Trends, Collaborative Patterns, and Research Gaps. *Spectrum of Engineering and Management Sciences*, 2(1), 247-262. <https://doi.org/10.31181/sems21202431k>.
- [16] Kumar, R., & Pamucar, D. (2025). A Comprehensive and Systematic Review of Multi-Criteria Decision-Making (MCDM) Methods to Solve Decision-Making Problems: Two Decades from 2004 to 2024. *Spectrum of Decision Making and Applications*, 2(1), 178-197. <https://doi.org/10.31181/sdmap21202524>.
- [17] Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329-340. <https://doi.org/10.1016/j.bir.2017.12.003>.
- [18] Yue, P., Korkmaz, A. G., Yin, Z., & Zhou, H. (2021). The rise of digital finance: Financial inclusion or debt trap? *Finance Research Letters*, 47, 102604. <https://doi.org/10.1016/j.frl.2021.102604>.
- [19] Fu, J., & Mishra, M. (2021). Fintech in the time of COVID-19: Technological adoption during crises. *Journal of Financial Intermediation*, 50, 100945. <https://doi.org/10.1016/j.jfi.2021.100945>.
- [20] Lu, Z., Wu, J., Li, H., & Nguyen, D. K. (2021). Local Bank, Digital Financial Inclusion and SME Financing Constraints: Empirical Evidence from China. *Emerging Markets Finance and Trade*, 58(6), 1-14. <https://doi.org/10.1080/1540496x.2021.1923477>.
- [21] Buttice, V., & Vismara, S. (2021). Inclusive digital finance: the industry of equity crowdfunding. *The Journal of Technology Transfer*, 47(4), 1224-1241. <https://doi.org/10.1007/s10961-021-09875-0>.
- [22] Zhao, H., Yang, Y., Li, N., Liu, D., & Li, H. (2021). How Does Digital Finance Affect Carbon Emissions? Evidence from an Emerging Market. *Sustainability*, 13(21), 12303. <https://doi.org/10.3390/su132112303>.
- [23] Li, Z., Chen, H., & Mo, B. (2022). Can digital finance promote urban innovation? Evidence from China. *Borsa Istanbul Review*, 23(2), 285-296. <https://doi.org/10.1016/j.bir.2022.10.006>.
- [24] Banna, H., & Alam, M. R. (2021). Impact of digital financial inclusion on ASEAN banking stability: implications for the post-Covid-19 era. *Studies in Economics and Finance*, 38(2), 504-523. <https://doi.org/10.1108/sef-09-2020-0388>.
- [25] Su, L., Peng, Y., Kong, R., & Chen, Q. (2021). Impact of E-Commerce Adoption on Farmers' Participation in the Digital Financial Market: Evidence from Rural China. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(5), 1434-1457. <https://doi.org/10.3390/jtaer16050081>.
- [26] Jiang, X., Wang, X., Ren, J., & Xie, Z. (2021). The Nexus between Digital Finance and Economic Development: Evidence from China. *Sustainability*, 13(13), 7289. <https://doi.org/10.3390/su13137289>.