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Fintech and Financial Inclusion: A Review

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Abstract: Fintech and Financial inclusion (FI) have been areas of growing interest. Fintech is expanding quickly and at different rates across areas and countries and can be considered a pivot factor expanding FI. This review study undertaken on a final 117 papers (initial 634 results) of Scopus database seeks to trace the journey of the conflux of Fintech and FI. This is the first paper that focuses entirely on this conflux. Bibliometric analysis using VOS Viewer software has been used to review the papers - Initial data statistics focuses on the publication and trend analysis; citation analysis is used to list out the most influential countries and articles in the field and keyword occurrence analysis has been used to find the 40 most widely studied topics (keywords) in the field. Also, a detailed review has been presented on the top 10 most cited papers. Lastly, an attempt has been made to contribute to future research agendas in the field.

Introduction

Fintech is revolutionizing the financial industry (Boot et al., 2020). Financial institutions use technology (Arner et al., 2020) and cloud-based data (Philippon, 2020) to offer personalized solutions at cheaper costs (Thakor, 2020). Therefore, many anticipated Fintech to boost FI (Demircuc et al., 2018) and improve the well-being of underprivileged populations (Breza et al., 2020). The conceptualisation of "FinTech" has shifted from being obscure and inconsistent to becoming an essential component of every day operations across various industries globally.

Fintech is projected to cover gaps in payments and loans, particularly when traditional financial services are unavailable. Demircun et al., (2017) conducted a survey-based analysis on Financial Inclusion (FI). According to Fuster et al., (2019), Fintech is commonly used in conjunction with traditional banking services rather than replacing them. On the contrary, research also contends that Fintech (Sumit et al. (2019) and large tech lenders (Hau et al., 2018) help borrowers (Jagtiani & Lemieux 2018)) who have historically been underserved by banks (Frost et al., 2019)

Different definitions of Financial Inclusion have evolved over time. The World Bank (2014) defines it as "the share of households and organizations using financial services". According to Amidži et al., (2014), FI refers to ensuring that everyone has access to, knowledge of and affordability of fundamental financial services, for efficiency reasons. It is also described as the use of formal financial

ecosystem to improve the economic health of people (Demirgüç et al., 2013). According to Sahay et al., (2015), FI is the availability and usage of financial systems and services at a reasonable cost, especially for the more disadvantaged sections of the society.

The main contribution of this study is that, to the best of our knowledge, it offers the first bibliometric analysis dedicated solely to FinTech and financial inclusion. Table 1, compares the earlier review studies with the current study.

Table 1: Comparison of Recent Review Studies with the Current Study

Dimensions	Allen et al., (2022)	Wojcik (2021)	Galvez-Sanchez et al., (2021)	Ozili (2020)	Gallego-Losada (2022)	Tandon et al., (2023)	Our Study (2024)
Focus	Fintech, Cryptocurrencies and CBDC	Approaching the role of fintech in finance from geographical perspective	FI only	FI only	Digital Financial Inclusion	FinTech	Impact of FinTech on Financial Inclusion
Period	Not mentioned	Not mentioned	1986-2020	Not mentioned	1990-2021	1985-2022	2017-2024
Keywords	"Fintech, Cryptocurrency Regulations, Stablecoins, CBDCs, e-CNY, China"	"financial - geography, governance, inclusion, regulation, stability and technology, FinTech"	financial inclusion; financial literacy; fintech; microfinance; bibliometrics	"financial - inclusion, technology, finance, institutions, stability; poverty reduction, economic cycle, systemic risk, controversy, Fintech"	"Financial inclusion ICTs Digitalization Mobile-money Fintech"	"Fintech, Financial technology, literature review, bibliometric analysis"	"Fintech, Financial Inclusion, Digitalization, digital finance, Mobile-money"
Methodology	Structured Review	Structured Review	Bibliometric Analysis	Structured Review	Bibliometric Analysis	Bibliometric Analysis	Bibliometric and Structured Review

The study has been undertaken with the following objectives:

- To identify the countries which are pioneers in the field i.e. substantial research work has been done in the area of Fintech and FI
- To identify the top influential authors of the field and to study the association between them.
- To identify the most widely studied topics and emerging research topics in the field and to determine the scope for future research
- To present a detailed review of the top ten most cited papers.

The findings of this study can serve as a valuable resource for new researchers in identifying key articles, recurring themes, and the most frequently cited works and journals related to FinTech and financial inclusion. Additionally, it will provide insight into the range of topics that have already been explored in this area.

The rest of the paper is organised as follows, the methodology followed to conduct the analysis, followed by the presentation of findings. Finally, a summary of future scope has been presented.

Research Methodology

This study is aimed at conducting the bibliometric analysis of select research articles in the area of Fintech and FI followed by a targeted review of top ten papers. The research articles were sourced from Elsevier's Scopus database. Scopus was selected over Web of Science because, although Web of Science is often viewed as a more popular database, Scopus offers a wider and more comprehensive coverage in social sciences (Vieira & Gomes, 2009), and thus found to be appropriate for the area of this research. (Mongeon & Paul-Hus, 2016).

• Appropriate Search Terms and Initial Search Results

The keywords used for data collection from the Scopus database include- "Fintech" and "Financial Inclusion". Searching within 'Article title, Abstract, Keywords' in the initial phase of data collection, 634 results were found.

- **Exclusion Criteria and Final Data Set**

In the first phase of exclusion, five filters were placed- relevant subject area, full articles only, English language only, sourced from journals, and in the final publication stage only. 28 articles that were still under publication were also excluded. Thus, 325 papers were included for further analysis. In the next and final phase of exclusion, authors discretion was used to analyze the abstracts of the articles to determine if the research article was relevant for both the 'Fintech' and 'Financial Inclusion' domains. Certain themes such as "Financial literacy", "frauds", "sustainability", "green financing", "financial stability", "fintech entrepreneurship ecosystem", "crowdfunding" and "open banking" were excluded from the scope of the study to ensure focused results. The final sample resulted in a dataset of 117 research papers. The process of data collection followed has been enumerated in Figure 1.

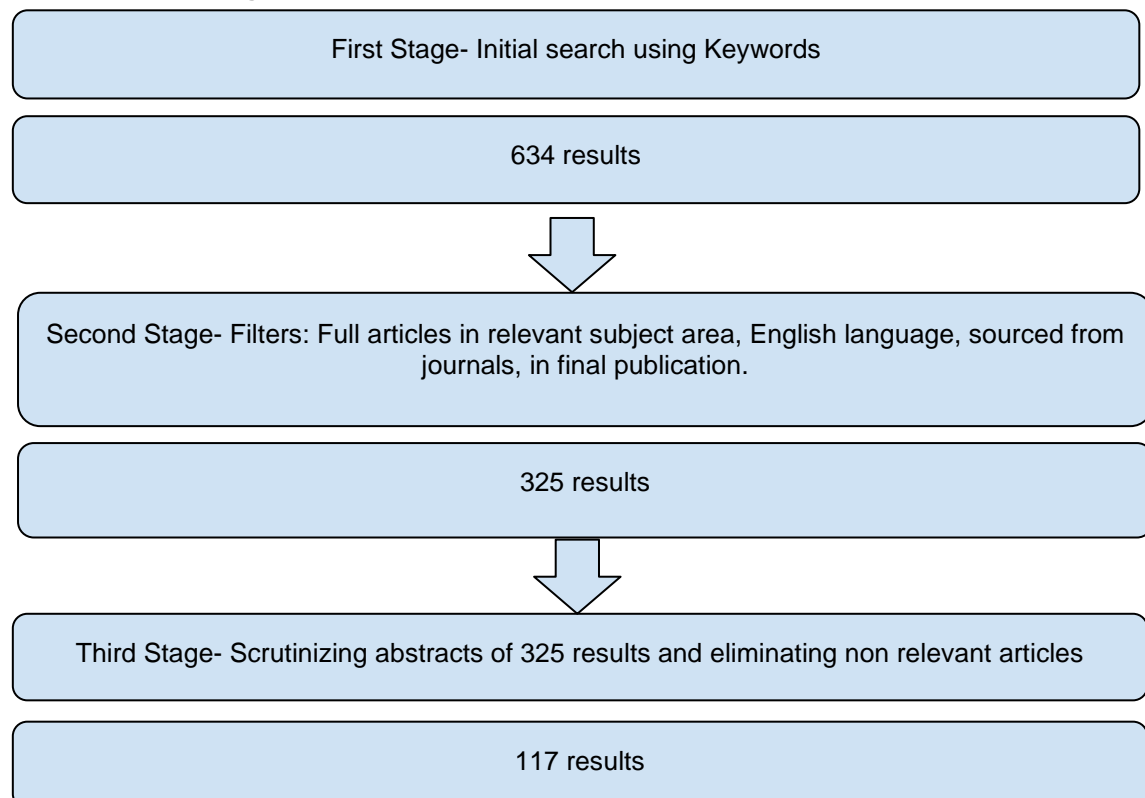
The final search query in Scopus database on 2nd September 2024:

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"TITLE-ABS-KEY ( "Fintech" AND "FinancialInclusion" ) AND
( LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "BUSI" ) OR
LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "SOCL" ) ) AND
( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND
( LIMIT-TO ( SRCTYPE , "j" ) ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) )"
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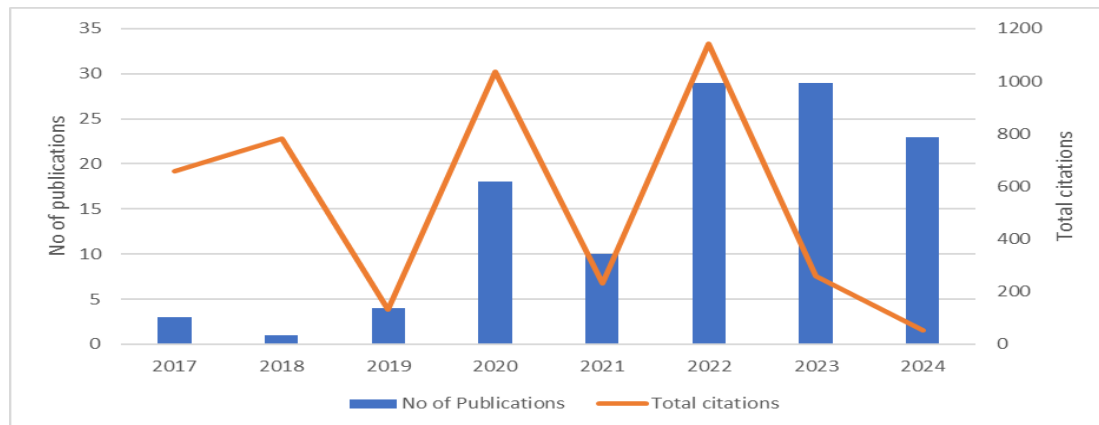
- **Initial Data Statistics- Trend and Volume analysis of Publications and top Journals in the Field**

Figure 2 shows the quantity of articles being published year on year in the Fintech and FI. These results exhibit an exponential growth in the number of publications after 2019. A significant drop has been seen in 2021, which can be attributed to the effects of the pandemic. Post recovery, the publications have picked up again.

Figure 1: Data Collection Process from the Scopus Database



Source: Author's Compilation

Figure 2: Publishing Trends in the area of Women Directors and CSR

Source: Author's compilation

Table 2 lists the top ten journals publishing articles on the themes of Fintech and financial inclusion. Borsa Istanbul review tops the list with the highest citation score of 793, followed by Finance research letters with 194 citations and Journal of Financial Intermediation with 123 citations. In terms of documents published, Journal of risk and financial management is the most impactful journal with 6 documents published, shadowed closely by Sustainability (Switzerland) with 4 documents. The top 10 Journals represent about 23.07% of the identified articles.

Bibliometric Analysis and Results

• Publication by Countries

The articles of this study were spread across 60 countries of the world- from the United States to Africa to India and more. This strongly suggests that the topic has generated interest throughout the world and no single country can claim a monopoly on the agenda of Fintech and financial inclusion. Figure 3 presents the network map of 20 countries meeting the threshold of 2 documents and 35 citations.

Table 3 presents the list of the top-most impactful countries in terms of citations in the field with at least thirty- five citations in Fintech and Financial Inclusion domain. United Kingdom tops this list with 20 documents and 2380 citations. China, a developing economy, stands at second with 12 documents and 595 citations. Australia stands at third with 4 documents and 531 citations.

Table 2: Top 10 publishing Journals in the area of Fintech and FI

Rank	Journal	Documents	Citation	Average Citation
1	Borsa istanbul review	2	793	396.5
2	Finance research letters	2	194	97
3	Journal of financial intermediation	2	123	61.5
4	Qualitative research in financial markets	2	103	51.5
5	Journal of risk and financial management	6	102	17
6	Environment and planning a	2	85	42.5
7	Sustainability (Switzerland)	4	85	21.3
8	Digital policy, regulation and governance	3	79	26.3
9	Journal of open innovation: technology, market, and complexity	2	45	22.5
10	Emerging markets review	2	42	21

Source: Authors compilation using VOS Viewer

Interestingly, we see that 6 out of these 10 countries are developed nations. This suggests that developed countries have been pioneers in the field, which is supported by the fact that economic development is a prominent factor for both Fintech and Financial inclusion. The fact that China, a developing country stands at rank 2 and India, another developing country, at rank 9, suggests that the tides are turning. Research in this area is picking up attention in the developing countries as well.

• Influential Authors

Author citation analysis was employed to identify the leading authors in the field and Author Co-Authorship Analysis has been used to study the association between them. Table 4 presents the top 10 Authors in the field with a minimum of 2 documents published and a minimum of 50 citations in the area of Fintech and FI. The results are as follows- Ozili and Osabutey topped the list with 3 publications each. In terms of citations too, Ozili has the highest number of citations- 826, followed by Senyo at 245 citations. Ozili and Senyo also have the highest average citations per document- 275.3 and 122.5 respectively. Ozili is a very impactful author.

Co-authorship analysis of the top 10 authors, depicted in Figure 5, presents the association between them - Osabutey, one of our highest authors in terms of number of documents published and citations received, has worked with Senyo. On the other hand, Nathan has worked with Setiawan and Hasan has worked with Khan. Our most influential author Ozili has interestingly not worked with any other influential author. Kim, Banna and Okello have also not collaborated with anyone.

**Table 3: Top 10 countries publishing in Fintech and Financial Inclusion
(Ranked by Citation Score, Threshold- 35 Citations)**

Rank	Country	Type of Economy (based on HDI)	No of the Documents published	Percentage of Total Documents	Citations	Average citation per document
1	United Kingdom	Developed	20	17.1	2380	119
2	China	Developing	12	10.3	595	49.6
3	Australia	Developed	4	3.4	531	132.8
4	United States	Developed	18	15.4	435	24.2
5	Sweden	Developed	2	1.7	293	146.5
6	Hong Kong	Developed	2	1.7	267	133.5
7	Malaysia	Developed	9	7.7	251	27.8
8	South Africa	Developing	7	5.9	439	34.2
9	India	Developing	17	14.5	235	13.8
10	Indonesia	Developing	11	9.4	193	17.5

Source: Author's Compilation using VOS viewer



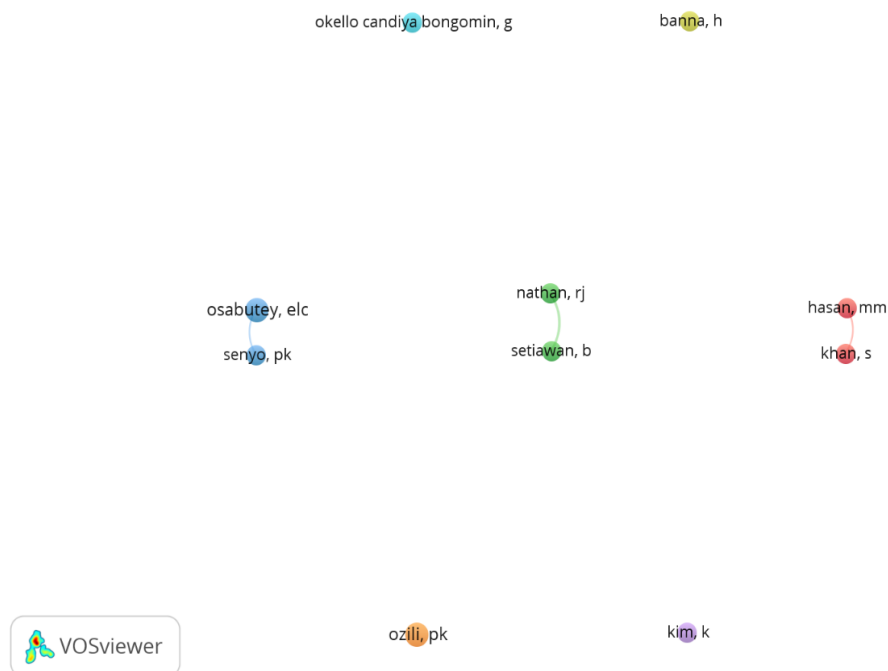
**Figure 3: Network map of top 20 countries publishing in the field
(Threshold- 2 documents, 35 citations)**

Source: Author's compilation using VOS viewer

Table 4: Top 10 Authors Publishing in the Field (Threshold- 2 Documents and 50 Citations)

S.No.	Author	Number of Documents Published	Citations	Average Citation per Document
1	ozili, pk	3	826	275.3
2	senyo, pk	2	245	122.5
3	osabutey, elc	3	211	70.3
4	banna, h	2	155	77.5
5	khan, s	2	88	44
6	hasan, mm	2	85	42.5
7	nathan, rj	2	76	38
8	setiawan, b	2	76	38
9	okello candiya bongomin, g	2	61	30.5
10	kim, k	2	51	25.5

Source: Author's compilation using VOS viewer and Scopus

**Figure 4: Network Visualisation Map: Co-Authorship of Authors (Threshold - 4 Publications, 10 Citations)**

Source: Author's compilation using VOS viewer

• Keyword Occurrence Analysis

The Keyword occurrence analysis has been used to fulfill the third research question. It leads to the identification of the most widely researched topics in the field as well as enables an understanding of the association between these dimensions. It enables us to identify the keywords in the field and the frequency of their occurrence. Conducted on the "all keywords" basis, with the threshold level of 3 occurrences, it led to the identification of 40 keywords, presented in Figure 5. The threshold has been kept at 3 (a low occurrence level) keeping in mind the rationale used in (Singh, Singhania, & Aggarwal, 2021) that the area being a new and emerging arena, may not have many frequently occurring keywords. "Financial Inclusion" and "Fintech" dominated the analysis with 79 occurrences, followed by "Financial

These were then followed by the following- "Financial system" (9 occurrences), "Banking" (7 occurrences), "Digital Finance" (5 occurrences), "Digital financial inclusion" (5 cases), and so on. What has been particularly interesting to note is that Africa as a key word featured in the analysis with 5 occurrences and India with 4 occurrences. No other country has been included as a keyword in the top 40.

Research began with themes like Digital technologies (3 occurrences), Ecosystems (3 occurrences), and Digitalisation (3 occurrences). Then, the debate shifted to the financial system, marked by Financial stability (4 occurrences), Financial system (9 occurrences), digital finance (5 occurrences)

**Figure 5: Network Visualisation Map of Keyword Occurrence Analysis
(Threshold 3 Occurrences, Display 40 Keywords)**



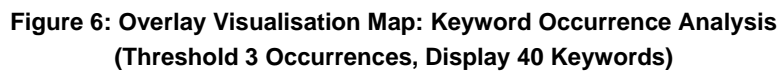


Table 5: A Detailed Review of the Top Ten most Cited Papers

Authors/Year	Title	Aim/Objectives	Research and Methods
Ozili (2018)	“Impact of digital finance on financial inclusion and stability”	To explore how digital finance influences FI, in turn impacting the steadiness of the economic system	Based on secondary resources, a descriptive study has been carried out.
Gabor & Brooks (2017)	“The digital revolution in financial inclusion: international development in the fintech era”	It explores the significance of Digital FI in development initiatives, providing nuanced methods of expanding FI both domestically and globally, and the role of Philanthropy, state and international organisations in facilitating such perforation.	A descriptive analysis has been utilized.
Demir et al., (2022)	“Fintech, financial inclusion, and income inequality: a quantile regression approach”	This paper investigates the nexus between FinTech, FI, and income inequality in the economy, focusing on how FinTech impacts inequality, both directly and indirectly through its role in promoting financial inclusion.	An empirical analysis of data collected for 140 countries for the three years which are 2011, 2014, and 2017

Arner et al., (2020)	"Sustainability, FinTech and Financial Inclusion"	To explore the significance of FinTech for sustainable development and promoting both financial inclusion and balanced development.	A descriptive analysis
Leong et al., (2017)	"Nurturing a FinTech ecosystem: The case of a youth microloan startup in China"	To examine the growth trajectory of a FinTech company who targets college students through micro-loans in the Chinese economy.	In-depth semi-structured interviews and corroborated by the author's observation notes.
Mhlanga (2020)	"Industry 4.0 in finance: the impact of artificial intelligence (AI) on digital financial inclusion"	To probe how digital financial inclusion is impacted by AI	Conceptual analysis of articles, reports and all the documents on the theme
Senyo & Osabutey (2020)	"Unearthing antecedents to financial inclusion through FinTech innovations"	To investigate the factors driving the real-world adoption of fintech innovations and their role in enhancing financial inclusion, drawing insights from behavioural and technological perspectives.	By applying the PLS-SEM on survey responses collected from 294 respondents
Yue et al., (2022)	"The rise of digital finance: Financial inclusion or debt trap?"	To examine the effect that digital finance has on Chinese households.	A descriptive analysis based on CHFS for four years that includes 2013, 2015, and 2017
Fu & Mishra (2022)	"Fintech in the time of COVID-19: Technological adoption during crises"	To find out the impact that COVID-19 has on the adoption of fintech worldwide and how it advanced the financial sector	Real-time data of application downloads

Conclusion and Scope for Further Research

The bibliometric analysis maps the journey of the conflux of fintech and financial inclusion from 2017 to 2024. Although there was less work in the field in the beginning, there has been an exponential growth in the publications after 2019. The study points to the growing knowledge base in the area which spreads across 60 countries of the world. Developed countries like UK, USA, Australia etc have been pioneers in the field, but emerging economies like China, South Africa and India are gaining traction. The top ten journals represent about one-fifth of all published papers in the area and are spread across multidisciplinary subjects, from Finance Research Letters to Sustainability (Switzerland). The Journal of Risk and Financial Management is one of the most sought-after journal in the field. Borsa Istanbul review has the highest average citation score of 396.5. These journals portray potential avenues for publication that are both renowned and safe. Ozili is undoubtedly the most prominent and influential author in the field. The keyword occurrence analysis reaffirmed the strong linkage between Fintech and Financial inclusion.

Two countries, Africa and India, also featured as keywords. It signifies the growing literature in the field in these two countries and may develop as a future research arena. The emerging areas of research – Sustainability, Artificial Intelligence in lending, Inclusivity and others present interesting scope for future research. Future research can also focus on emerging markets and economies.

The study is not without its imitations. It has been undertaken on research articles collected from a single database (Scopus) and may have missed other studies available from other data sources. That can be covered under future research. Nevertheless, it contributes greatly to the existing literature, and the implications- theoretical, practical as well as managerial- would benefit firms and academicians alike.

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