NJESR/June2025/Volume-7/Issue-6 E-ISSN-2582-5836
DOI-10.53571/NJESR.2025.7.6.23-32

Fintech and Digital Payments: A Bibliometric Exploration Using R for Historical and Trend Analysis

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(Received-20 May2025/Revised-16MaJune2025/Accepted-25 June2025/Published-30June-2025)

Abstract

FinTech has transformed financial transactions, making them faster, more efficient, and secure by combining technology and finance, with digital payments at its center. This study will investigate upcoming FinTech trends using a bibliometric analysis of 454 papers from the Dimensions database spanning the years 2015 to 2024. Using R Studio, Microsoft Excel, and Vosveiwer for data visualization and frequency analysis, the study identifies key contributors, influential journals, leading organizations, and significant countries in the FinTech research landscape. The results show that Almajali et al., (2023) are the most frequently referenced authors, Sustainability. Switzerland is the leading journal, and Indonesia emerges as the top publishing country, with the University of Jordan being the most prominent institution contributor. The study also focuses on crucial research topics for digital payments, such as adoption, acceptability, and the UTAUT model. By mapping the current research scenario, this study provides useful insights for researchers, underlining the importance of identifying relevant organizations to direct future investigations in the rapidly changing FinTech subject.

Keywords: Fintech, Digital Payment, dimension Database, R studio, Bibliometric Analysis

1. Introduction

The term "Fin-Tech" derives from the union of the words finance and technology and represents what the acronym actually means, includes the development of technology and innovation to support banking and financial skills with the latest technologies. To comprehend FinTech's origin and the trends it offers, a precise definition is necessary. FinTech is an emerging technical term that has since been defined by Gai et al., (2018) “describes the financial technology sectors in a wide range of operations for enterprises or organizations, which mainly addresses the improvement of the service quality by using information technology (IT) applications.” Ozili (2018) explained it more simply: “The term ‘FinTech’ denotes ‘financial technology and is defined as the delivery

of financial and banking services through modern technological innovation led by computer programs and algorithms." Takeda & Ito (2021) adopts a simple definition of FinTech: "financial innovation realized by information technology (IT)".

From the earliest stages of development, finance and technology have been interconnected and mutually reinforcing. The development of fintech, or financial technology, from simple financial products to advanced digital ecosystems is reflected in its history. FinTech is often considered new, although it has a history that can be traced back to 1866, when the first cable was laid successfully Paul & Sadath (2021). Fintech has begun in the 19th century, when financial transactions were transformed by telegraph technology and transatlantic cables Arner et al., (2015). Cashless transactions were possible with the advent of credit cards in the 1950s, which signaled the start of digital payment systems Cohen (2016). Automated Teller Machines (ATMs), developed in the 1960s, boosted fintech by offering self-service banking options Rosenberg (2019). The 1980s saw the advent of electronic stock trading platforms, which transformed the securities market. The 1990s saw the rise of online banking, which allowed clients to access financial services via the internet Frame and White (2014). Peer-to-peer (P2P) lending platforms appeared in the early 2000s, bringing borrowers and lenders together directly Morse (2015). The 2009 initialization of Bitcoin introduced blockchain technology, which had a tremendous impact on payment systems and financial innovation Nakamoto (2008). Recent innovations, such as artificial intelligence and mobile banking, have driven fintech into the mainstream of financial services Gomber et al., (2017).

Biblioshiny was applied for descriptive analysis, and VOS viewer for co-citation and co-occurrence analysis Bashar et al., (2024). However, a large amount of research addresses the adoption of fintech in terms of technology and user perceptions Mathur et al., (2018); Fernando et al., (2018); Nomakuchi et al., (2018); Ryu et al., (2018); Eman et al., (2018); Stewart et al., (2018); Huei et al., (2018); Suryono et al., (2020).

1.1Research Questions

To explore the history and trends of intellectual capital by addressing the following research questions:

RQ1. What are the contributions of Prolific Researchers, leading nations, and the most active academic institutions?

RQ2. What are the frequent terms and research areas?

RQ3. What country has dominance based on major applications?

RQ4. What are the key developments in the literature from 2016 to 2024?

RQ5. Who are the key authors, and how has their impact evolved over time?

This article structure is divided into multiple sections. The study's materials and methodology are described in depth in Section 2, which also offers a thorough explanation of the instruments and techniques used. The data is presented and examined in Section 3, with conclusions drawn from the analysis. The study is finally brought to a close in Section 4, which summarizes the main findings and at last section 5 offers future directions derived from the analysis.

2. Material and Methodology

This study uses bibliometric analysis to identify key authors, papers, journals, countries, and institutions in FinTech digital payments. The dataset was sourced from Dimensions. The analysis aims to trace the evolution of FinTech research and highlight influential contributions. It follows methods outlined by Tepe et al., (2021), Higuita et al., (2012), Morant et al., (2016), and Martínez-Climent et al., (2018). The selected approach aligns with the study's objectives.

The literature data used in this paper are obtained from Dimension database Hakkari (2023) one of the most widely used databases in academics, owned by Digital Science (or Digital Science & Research Solutions Ltd) - a technology company headquartered London, United Kingdom. In this paper, Author derived data through the search function in Dimension by selecting as Database = Dimension AI Core Collection database; Topic search = ("Fintech" OR "Digital Payments" OR "Digital Payment Systems" OR "Mobile Payments" OR "Fintech Adoption" OR "Digital Finance" OR "E-payment" OR "E-wallets") AND ("UTAUT" OR "Unified Theory of Acceptance and Use of Technology" OR "Extended UTAUT Model" OR "UTAUT2" OR "Technology Adoption Models") AND ("adoption" OR "acceptance" OR "perception" OR "behavioral intention" OR "use behavior" OR "intention to use") AND ("Factors" OR "Barriers" OR "Drivers" OR "Challenges") AND ("Technology Acceptance" OR "Behavioral Model" OR "Consumer Behavior" OR "User Experience" OR "User Satisfaction") AND ("India" OR "Indian Context" OR "Developing Country") As a result, 452 documents were retrieved and exported in csv file format for bibliometric analysis. The contents in the derived documents are representative, including title, abstract, keywords, citations and references.

3. Analytical Insights and Trends

This section presents the results, periods, publications, authors, and other information of the analyses.

3.1 Trends of document publication

Figure 1 shows a sharp rise in FinTech digital payment publications, with 452 articles indexed from 2016 to 2024. From 2016 to 2018, only a few studies appeared annually. A notable jump occurred in 2019–2020, driven by growing interest and the COVID-19 impact. Publication numbers surged further from 2021 onward, peaking at 126 in 2023 and 128 in 2024. This reflects rapid fintech growth, increased investment, regulation, and academic focus.

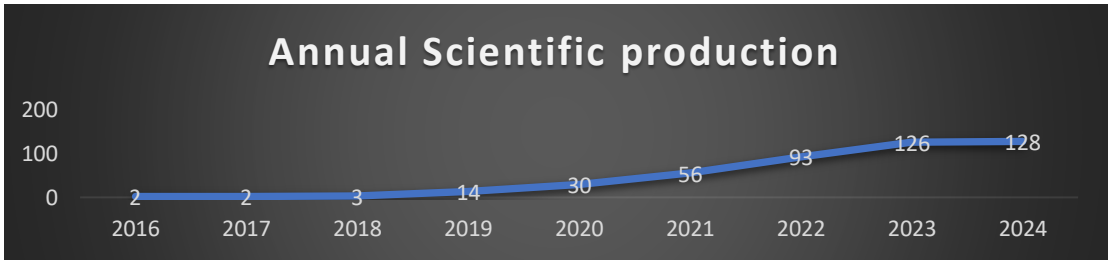
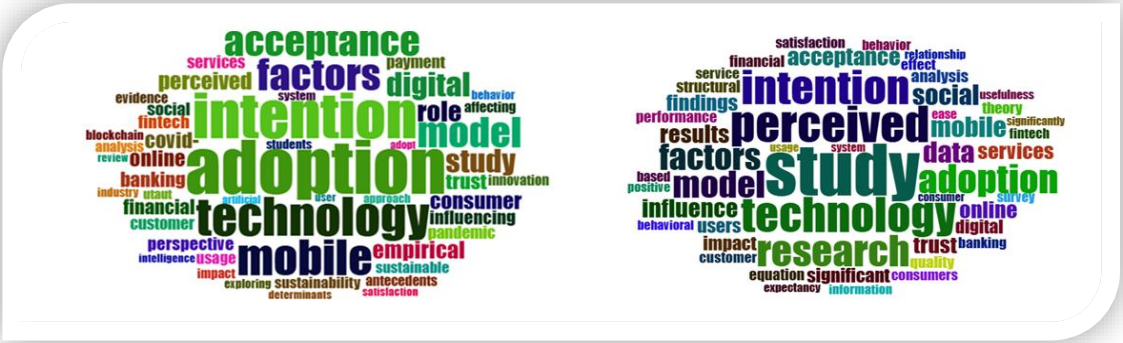


Figure 1. Annual Production in FinTech Digital Payment. Note(s): This figure represents the publication trend of academic papers on FinTech between 2016 and 2024. The data were retrieved from the Dimension database using the above string produce by Excel.

3.2 Keyword Analysis

Keywords are an essential factor in searching the literature. We have found essential keywords fintech literature, shown in the shape of word clouds in Figure 2. It is evident that fintech digital payment is the main keyword for the literature; our focus is on other keywords representing various topics or fields. In the abstract, Fintech is the most commonly used keyword in studies relating to technology, acceptance, adoption. The keyword "title" and "author" signify legitimate fintech themes. According to the figure, the title keyword Adoption appears 113 times, while Technology 80, Mobile 75, and so on appear frequently in prior studies. According to the diagram, the most targeted term is study, which appears 833 times, followed by technology (565), adoption (465), and mobile (323).



Title Keyword Abstract Keyword

Figure 2: Word cloud using R studio

3.3 Geographical Distribution of Contributing Countries

Figure 3 shows geographical location of all country's collaboration Map shows the geographical locations of all contributing countries, with the number of publications decreasing from dark to light blue, grey indicated no contribution. Malaysia, Saudi Arabia, Indonesia has more publication. Greenland, Argentina, Mayammar have no contribution in this area. Enhance contributions from regions with no activity, like Greenland, Argentina, and Myanmar, while strengthening collaborations with leading countries like Malaysia, Saudi Arabia, and Indonesia.

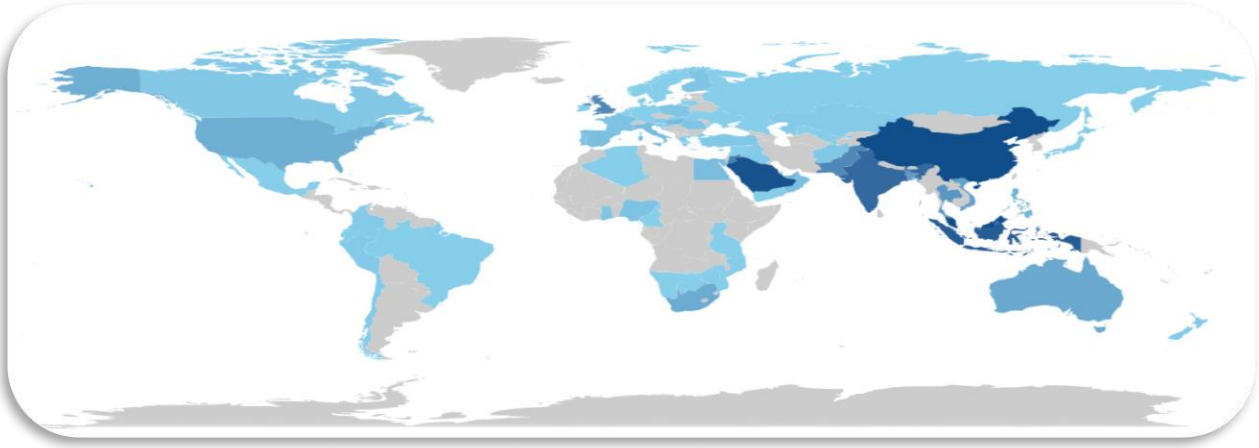


Figure 3: Geographical Distribution of Contributing Countries: Visualization Using R Studio and Dimension Dataset

3.4 Country collaboration Map

Figure 4 illustrates the country collaboration network in FinTech digital payments. Each node represents a country, with size indicating publication volume and edges showing collaboration strength. Thicker lines denote stronger partnerships. Clusters of countries are shown in different colors based on collaboration intensity. India emerges as a key node, strongly connected to nations like Indonesia, UK, and China.

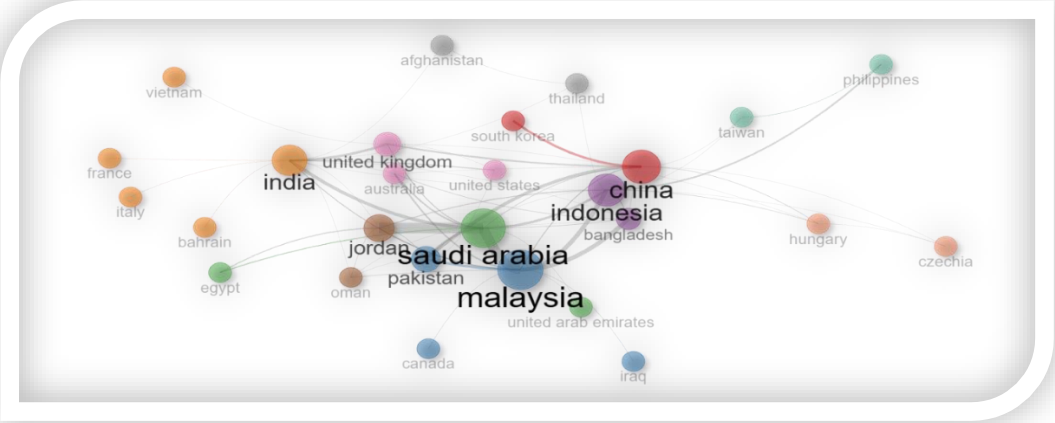


Figure 4: Country collaboration Map

3.5 Top ten institution of Most Productive Academic articles

Further, the top 10 organizations producing research publications on FinTech are shown in Figure 5. The table shows the ranking of the top 10 most influential institutions based on the number of published papers. The study results showed that the University of Jordon is most productive article producing institute.

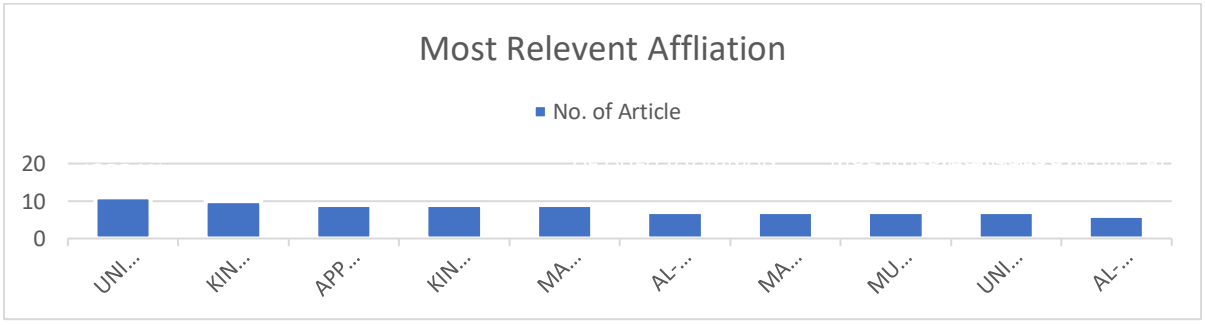


Figure 5: **Top 10 funding sponsors of documents**. Note(s): This figure represents the 10 institutes that sponsored the most academic articles on FinTech between 2015 and 2021. The data were taken from the Scopus database using the keyword "FinTech Digital Payment using Excel.

3.6 Most Profolic Authors

According to the statistics in Figure 4 and Table 2, which authors have been the most prolific. Table 4 lists authors who have published at least five times between 2016 and 2024. Lutfi, Abdawli, has the most publications and a TC score of 377. Almaiah, Mohammed Amin, is in second place with a TC score of 291. Mohammed Amin, Alrawad, Mahmoad, Al-okaily, Manaf, Almajali, and Dmaithan all have identical TC scores and H-Indexes, despite having the lowest TP score.

Table 2: Author Impact Metrics Analysis

Sr No.	Authors	TC (Total citation)	TP (Total Production)	H-Index
1	Lutfi, Abdawli	377	9	6
2	Almaiah, Mohammed Amin	291	7	4
3	Alrawad, Mahmoad	289	5	4
4	Al-okaily, Manaf	186	7	4
5	Almajali, Dmaithan	81	10	4

3.7 Pioneering Authors in Digital Payment Literature

The Figure 6 shows the number of documents published by various writers, with ALMAJALI D having the most (10), followed by Lutfi A, Al-Gasawneh Ja, and Al-Okaly M, who each have 7-9 publications. Authors including Masadeh R, Masa'deh R, Ong Aks, and THURASAMY R have produced fewer documents, ranging from five to six.

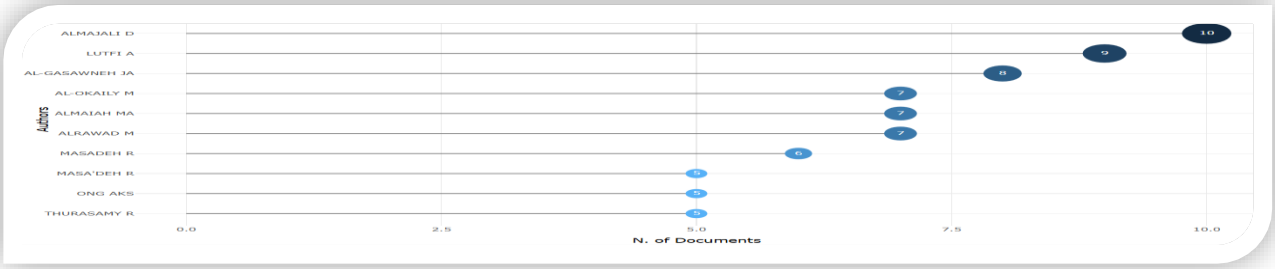


Figure 6: Show relevant author(s) of fintech digital payment literature

3.8 Lotka Law

A Lotka plot is a graph that depicts how many writers contribute to academic or scientific work, as well as their productivity level. The x-axis represents the number of documents written by one author. The y-axis shows the percentage of authors who wrote that number of documents. Lotka's Law (Lotka 1926) forecasts how many publications an author will have in a certain subject. That is, 60% of the authors will write one article, 15% two, 7% three, 4%

four, and so on. Tepe et al., (2021) give the results for FinTech papers, together with Lotka's anticipated distribution. The Lotka plot shows that 88.6% of FinTech authors have only one publication, 7.6% have two, and 2.5% have three. According to Lotka's Law, only 60% should have one paper, indicating a deviation from the expected pattern. The graph's dashed line represents Lotka's ideal distribution. While most authors contribute only once or twice, very few are highly productive. This reveals an unequal authorship pattern in FinTech research, though not fully aligned with Lotka's Law.

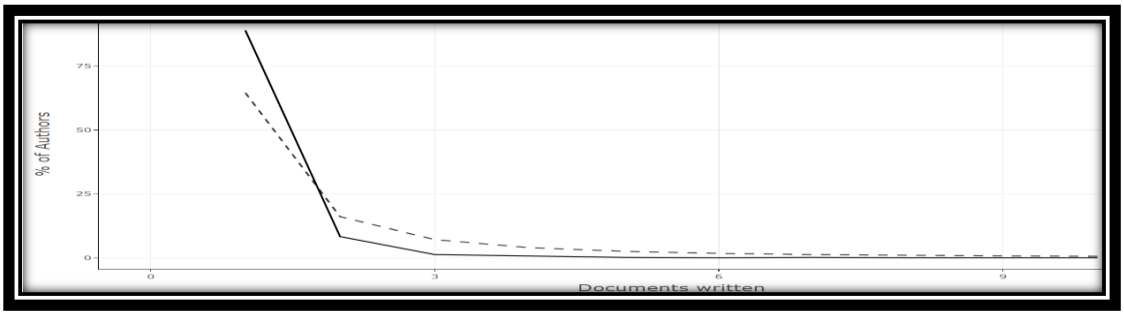


Figure 8: Lotka's Law of productivity, and actual authorship distribution.

4. Conclusion

This study conducted a bibliometric analysis on FinTech digital payments using data from the Dimensions database and tools like Excel, R-Studio, and VOSviewer. It analyzed four key research themes and found a significant rise in publications from 2016 to 2024, especially post-2019 due to COVID-19's impact on digital payments. India emerged as a major collaboration hub, while countries like Greenland and Argentina showed minimal contribution. Authors like Almaiah D. and institutions like the University of Jordan led research output. The study highlights the need for broader global collaboration and funding in this rapidly growing field.

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