

USING FINTECH IN INCREASING FINANCIAL INCLUSION: A BIBLIOMETRIC ANALYSIS

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Abstract

One of the main indicators that determine the effectiveness of financial markets and the actors in these markets is financial inclusion. Financial inclusion is a determinant of access to financial services. In basic terms, having a bank account or buying and selling bitcoin in an advanced digital environment is defined as financial inclusion. Financial technology provides ease of time and availability in reaching such financial services and products to individuals. This study presents a bibliometric analysis to determine the impact of financial technology in increasing financial inclusion between 2016 and 2025. 429 documents were selected using the Web of Science database, Biblioshiny and R Studio software were used for analysis. Bibliometric analysis includes performance metrics such as publication year, important studies in the field, influential authors, and scientific mapping such as word map and publication links. The study aims to explore the connection between the themes of “financial inclusion” and “financial technology” with the help of bibliometric analysis and to provide ideas for future studies. The data show that there has been a significant increase in the number of studies on financial technology and financial inclusion, especially after 2020, and significant publications have been made in this field in countries such as China, the USA, the UK and India.

Key Words: Bibliometrics, Biblioshiny, Financial Technology, Financial Inclusion

FİNANSAL KATILIMIN ARTIRILMASINDA FİNTECH KULLANIMI: BİBLİYOMETRİK BİR ANALİZ

Özet

Finansal piyasaların ve bu piyasalarda yer alan aktörlerin etkinliklerini belirleyen temel göstergelerden birisi finansal katılımdır. Finansal katılım, finansal hizmetlere erişimin belirleyicisidir. Temel anlamda bir banka hesabına sahip olunması veya ileri düzey dijital ortamda bitcoin alım satımı yapılması finansal katılım ile ifade edilmektedir. Finansal teknoloji, bu gibi finansal hizmet ve ürünlerin bireylere ulaşımı noktasında zaman ve elde edilebilirlik kolaylığı sağlamaktadır. Bu çalışma, 2016 ile 2025 yılları arasında finansal katılımın artırılmasında finansal teknolojinin etkisinin belirlenmesi amacıyla bibliometrik bir analiz sunmaktadır. Web of Science veri tabanı kullanılarak 429 belge seçilmiş, analiz için Biblioshiny ve R Studio yazılımları kullanılmıştır. Bibliometrik analiz, yayın yılı, alandaki önemli çalışmalar, etkili yazarlar gibi performans ölçümlerini ve kelime haritası, yayın bağlantıları gibi bilimsel haritalamayı içermektedir. Çalışma, bibliometrik analiz yardımı ile “finansal katılım” ve “finansal teknoloji” temaları arasındaki bağlantının keşfini ve gelecekteki çalışmalara fikir sunmayı amaçlamaktadır. Veriler, finansal teknoloji ve finansal katılım ile ilgili çalışmaların sayısında özellikle 2020 yılından sonra önemli bir artış olduğunu ve bu alanda Çin, ABD, İngiltere ve Hindistan gibi ülkelerde önemli yayınların yapıldığını göstermektedir.

Anahtar Kelimeler: Bibliometrik, Biblioshiny, Finansal Teknoloji, Finansal Katılım

Introduction

Technology is an important concept that accelerates consumption behavior and necessitates change due to its impact on many areas. In recent years, significant developments have occurred in financial technology (fintech), especially due to digitalization in financial markets. These developments have introduced new financial products to individuals' lives while accelerating the use and access of existing products. Fintech refers to the innovative use of technology in the design and delivery of financial products and services (Morse, 2015). Financial inclusion is defined as the ability of individuals and businesses within the economic system to access financial services that meet their needs. Financial inclusion is a key facilitator of sustainable economic growth and poverty reduction (Demirgüç-Kunt et al., 2018). Financial inclusion is a

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catalyst for achieving seven of the 17 Sustainable Development Goals. Additionally, it promotes economic growth and employment, supports women's economic empowerment, and contributes to the eradication of poverty (World Bank, 2025). Financial inclusion can help reduce poverty and inequality by helping people invest in the future, balance their consumption, and manage financial risks (Ediagbonya and Tioluwani, 2023). Fintech has grown rapidly over the past decade, disrupting traditional financial institutions and reshaping how individuals and businesses access and use financial services (Arner et al., 2016). The expansion of digital financial services has reduced the number of adults without access to an account from 2.5 billion in 2011 to 1.4 billion in 2021 (World Bank, 2025).

Fintech's capacity to increase efficiency and reduce expenses associated with financial services represents a means through which it can facilitate broader financial inclusion for individuals (Danladi et al., 2023). The main drivers of Fintech are technological advancement, consumer behavior, and regulatory conditions (Olowookere, 2019). Fintech has brought a different understanding to the provision of financial products or services to financial markets. With the emergence of this different understanding, the traditional development paradigm of the financial sector has changed (Buckley et al., 2021; Gomber et al., 2018). Fintech has not only provided advanced and innovative financial services to customers, but has also revolutionized the way financial transactions are conducted and financial services are operated (Blakstad and Allen 2018; Tsai and Peng 2017).

Financial inclusion refers to individuals' and organizations' access to useful and affordable financial products and services such as payments, deposits, insurance and loans (Dev, 2006). Financial inclusion involves providing financial services at affordable costs to all segments of society (FATF, 2013). Increasing inclusiveness in the financial sector enables the inclusion of those excluded from the markets in economic development and the attraction of new individuals into the economy and financial system as a result of economic growth (Anagnostopoulos, 2018; Cecchetti and Schoenholtz, 2020; Schuetz and Venkatesh, 2020). In this context, institutions in the financial sector have enabled individuals in rural areas to be included in the financial system by using new and easily accessible financial products. Moreover, financial inclusion supports economic growth by increasing financial resources to support real economic activity, especially for individuals and small and medium-sized enterprises.

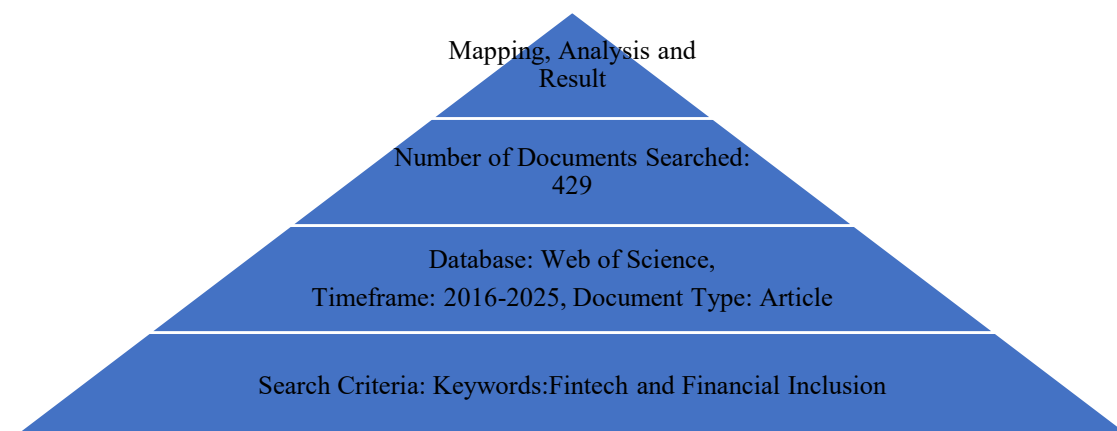
This study provides a comprehensive analysis of the literature by considering 429 studies focusing on fintech and financial inclusion processes, identifying high-impact researchers and publications. The data were evaluated using the bibliometric analysis method, which is the application of mathematical and statistical methods to publications and other communication tools (Groos and Pritchard, 1969). Various performance indicators were determined on the data for bibliometric analysis. The determined performance indicators were analyzed using R Studio and Biblioshiny software programs. The desired result of the analysis is to map the effects of fintech on financial inclusion through academic studies.

1.Methodology and Data

Bibliometric analysis was used to evaluate the studies conducted to date on fintech and financial inclusion. Bibliometric analysis is used to identify emerging topics by exploring clusters and to illustrate the areas of ideas seen in the work of the most influential researchers (Fahimnia et al., 2015). In addition, this method stands out as a more reliable way of evaluating the literature as it offers unique insights into recently developed research trends and themes (Ülker et al., 2022). The dataset was taken from the widely used Web of Science. The Web of Science database was used to create the data set. Fintech and financial participation were determined as keywords in the subject search. The language of the publication included in the research was English and

the time period selected for the search was 2016-2025. The data access date is March 2025 and 429 research data were included in the study.

Figure 1:Methodology



2.Results

In this section, which reflects the data collected from the Web of Science database until March 2025, the general results of the data, document and source types, most cited journals, articles, authors, keyword analysis, authorship networks, subject areas and country productivity are discussed.

2.1.Summary Statistics

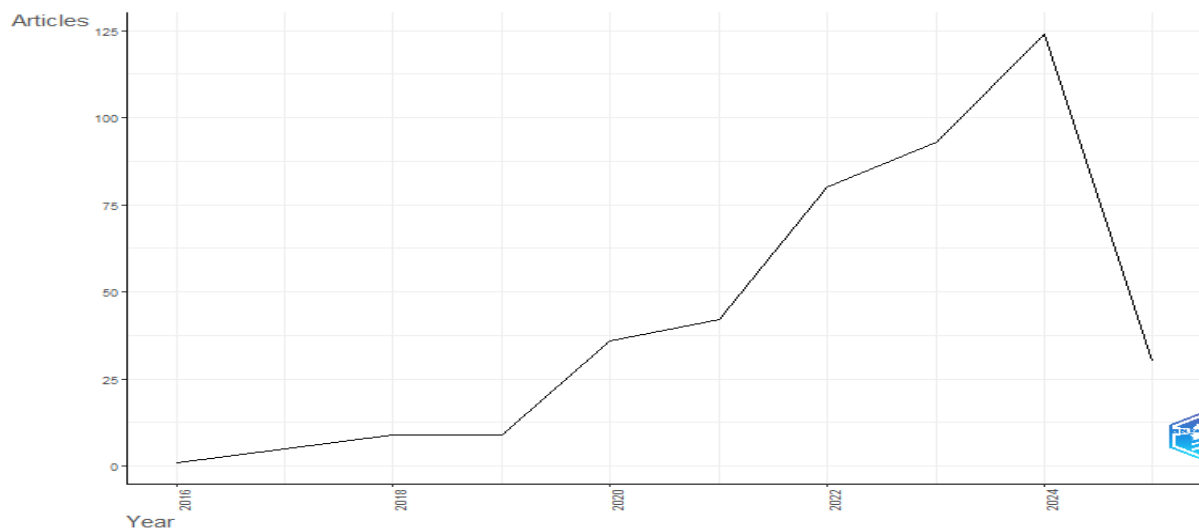
In this section, the results obtained from the bibliometric analysis conducted on 429 documents published between 2016 and 2025, related to the scope of fintech and financial inclusion, are evaluated. Each document retrieved from the Web of Science database has collected an average of 19.66 citations. Table 1 shows the number of studies on the use of fintech in increasing financial inclusion as 429, the annual growth rate of these studies as 45.92, the average age of the documents as 2.48, and the number of references as 22,037. In total, 429 documents were published and among these authors, 79 authors published 88 single-authored documents. The co-authorship rate per document was calculated as 2.84, and the international co-authorship rate was 38.46%. This value shows that there is a significant number of international collaborations among the authors.

The annual production trend of publications evaluating the effects of Fintech on financial inclusion is shown in Figure 2. In the relevant analysis, the number of articles published on the subject of the study in journals in this field from 2016 to 2025 are given. Looking at the process distribution of publications, a significant increase is observed in the number of studies on the research topic since 2020. The year 2020 is known as the starting point of the Covid19 pandemic period in the world. During this period, a number of restrictions were put into effect in social life in order to prevent the spread of the disease among people. As a result of these restrictions, people tended to use financial technology more, especially in order to conduct financial transactions. This situation has had a significant impact on the number of studies conducted in the field of fintech and financial inclusion. While the number of publications was 36 in 2020, it was 80 in 2022, 124 in 2024, and this number was calculated as 30 in the first three months of 2025.

Table 1:Summary Statistics

Basic Information About the Data	
Time Range	2016-2025
Sources (Journals, books, etc.)	245
Documents	429
Annual Growth Rate %	45.92
Average Age of Document	2.48
Average Citations per Document	19.66
References	22.037
Document Content	
Keywords	574
Author Keywords	1258
Authors	
Authors	1083
Single-Author Documents	79
Author Collaborations	
Single-Author Documents	88
Co-Authors per Document	2.84
International Co-Authorships %	38.46
Document Types	
Articles	363
Book Chapters	19
According to Paper	3
Early Access	44

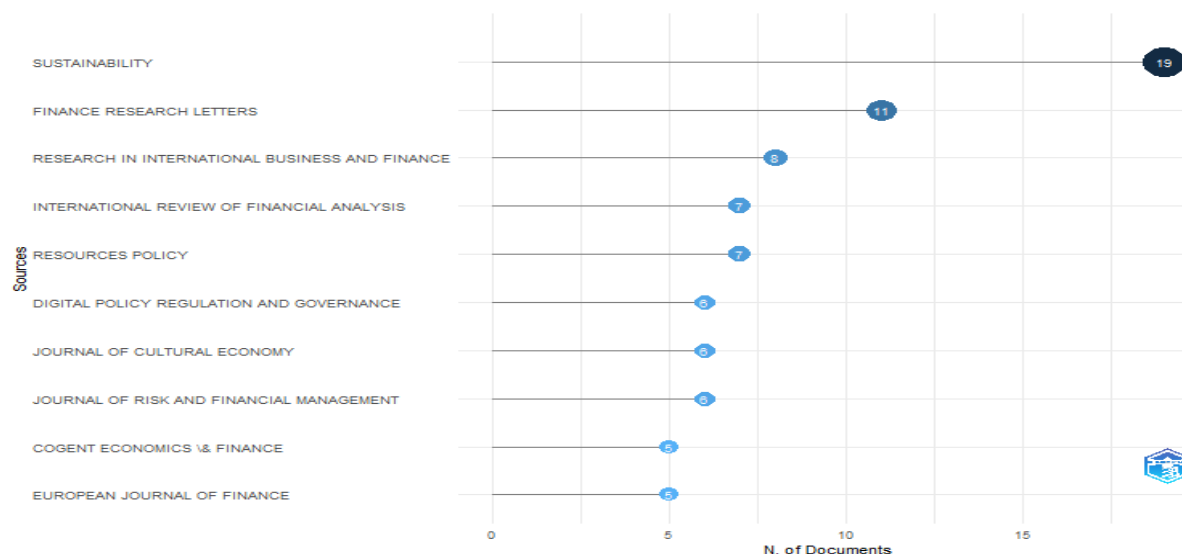
Source: Author's own creation based on the research data.

Figure 2:Annual Scientific Production

Source: Obtained by the author from Biblioshiny program

Figure 3, presents a bibliometric analysis of the most relevant sources for the research topic on financial technology increasing financial inclusion. The top three journals with the most publications among the top 10 leading sources in this field are Sustainability (19), Finance Research Letters (11), Research in International Business and Finance (8). When looking at the resources, it is seen that financial inclusion is closely associated with sustainability.

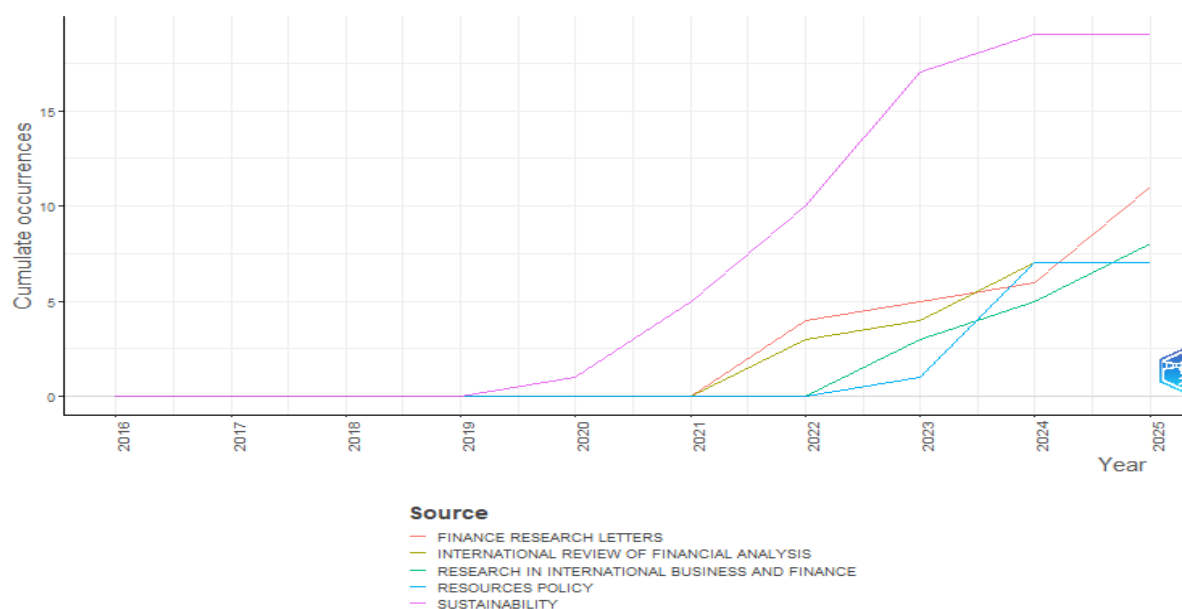
Figure 3:Most Relevant Sources



Source: Obtained by the author from Biblioshiny program

Figure 4 shows that the publication sources did not publish any articles on the research topic until 2019. As stated before, “sustainability” is the journal that has the highest contribution on fintech and financial inclusion. The journal has shown a significant increase in the number of publications in this field, especially between 2020 and 2023. When looking at the publication sources in Figure 4, it is seen that Finance Research Letters and International Review of Financial Analysis started to publish in the relevant field in 2021, Resources Policy and Research in International Business and Finance in 2022.

Figure 4:Sources’ Production Over Time

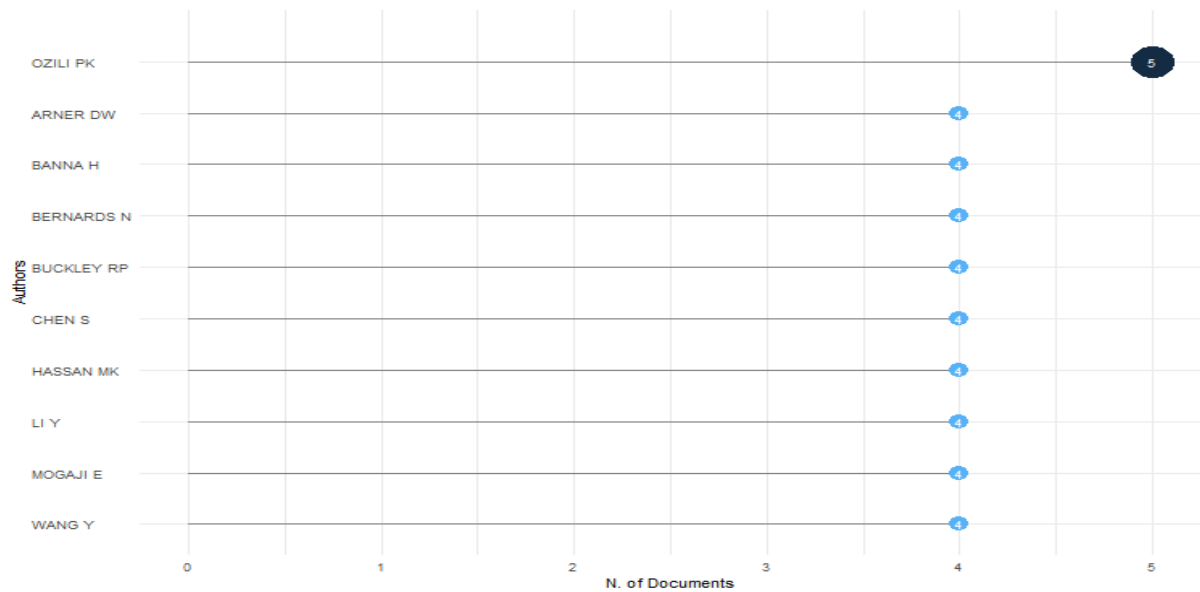


Source: Obtained by the author from Biblioshiny program

Figure 5 shows the number of publications of authors contributing to the field of fintech and financial inclusion with the help of bibliometric analysis. Between 2016 and 2025, Ozili PK

contributed 5 articles, and Arner DW, Banna H, Bernards N, Buckley RP, Chen S, Hassan MK, Li y, Mogaji E and Wang Y contributed 4 articles to the field.

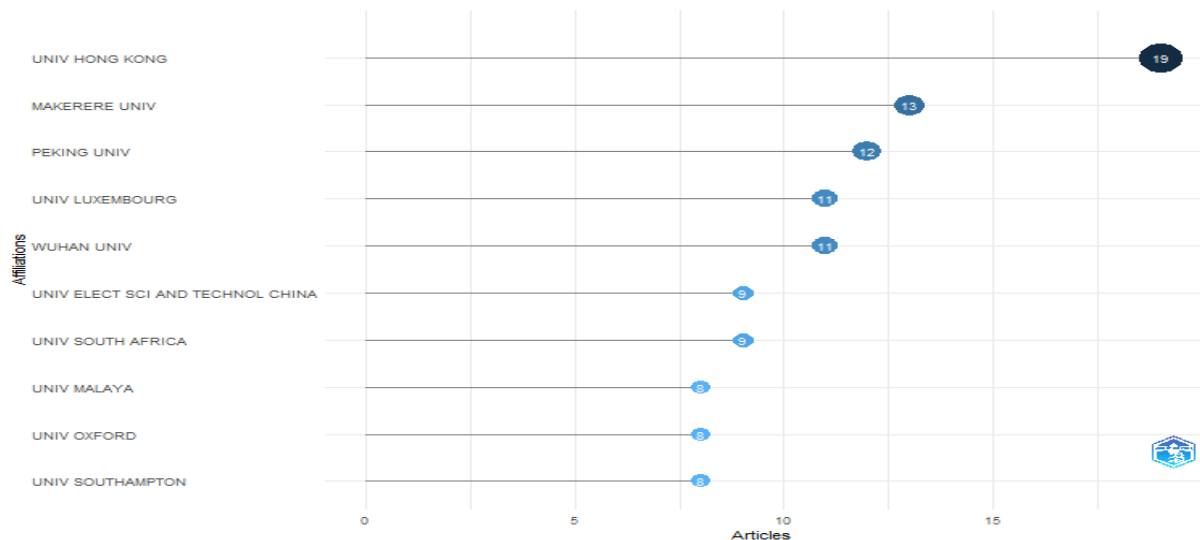
Figure 5:Most Relevant Authors Productiona Over Time



Source: Obtained by the author from Biblioshiny program

Figure 6 shows the institutions to which the authors are affiliated. The University of Hong Kong has the most published articles with 19 articles. This university is followed by Makerere University with 13 publications, Peking University with 12 publications, Luxembourg University with 11 publications, and Wuhan University with 11 publications. Institutional distribution also indicates which regions of the world are more inclined to conduct studies in this field.

Figure 6:Most Relevant Affiliations

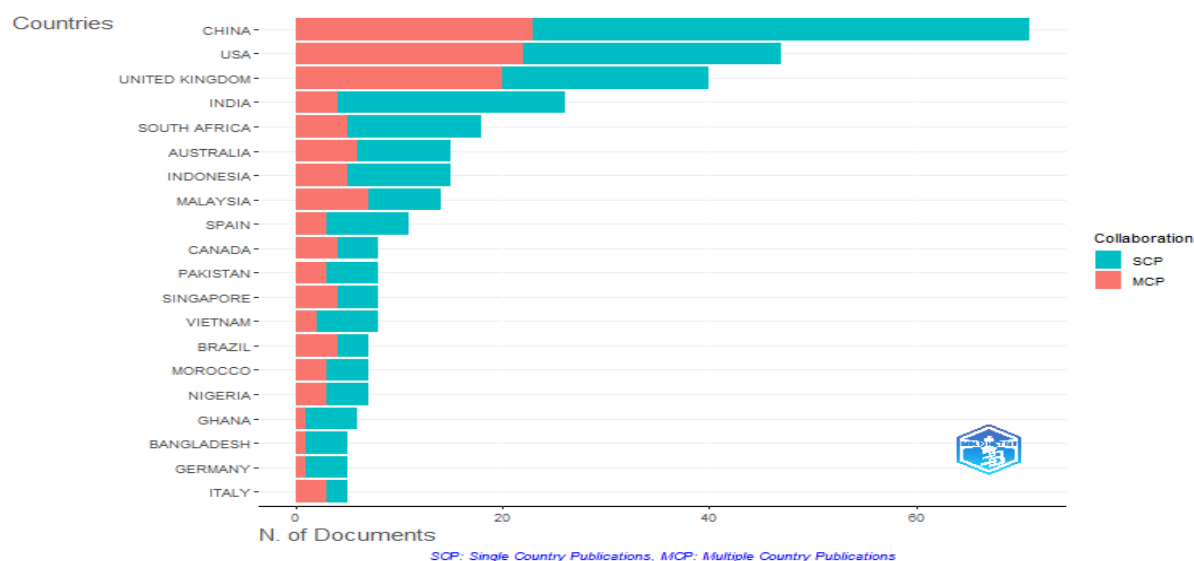


Source: Obtained by the author from Biblioshiny program

Figure 7 describes the number of documents published in collaboration with authors from different countries. MCP (Multiple Country Publication) refers to the number of publications produced in collaboration with foreign authors. SCP (Single Country Publication) indicates the number of publications made by authors nationwide. The top five countries with the most publications in collaboration with foreign authors are China (71), the United States (47), the

United Kingdom (40), India (26), South Africa (18). The top five countries with the fewest publications are Germany (1), Bangladesh (1), Ghana (1), Vietnam (2), and Pakistan (3).

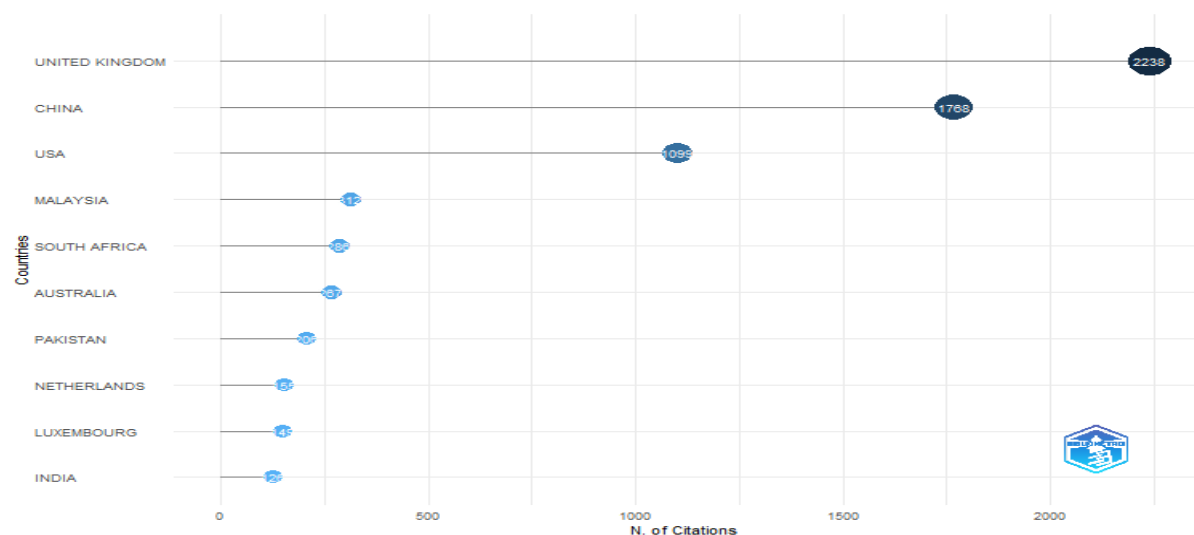
Figure 7:Corresponding Author's Countries



Source: Obtained by the author from Biblioshiny program

The 10 most cited countries are shown in Figure 8. The countries with the most citations for their publications in the field of fintech and financial inclusion are the United Kingdom (2,238), China (1,768), and the United States (1,099). The countries with the fewest citations are India (126), Luxembourg (149), and the Netherlands (155).

Figure 8:Most Cited Countries



Source: Obtained by the author from Biblioshiny program

Citation analysis is a common method of measuring the importance of an article based on citation frequency. Table 2 shows the most influential authors and journals in the fintech and financial inclusion field by citation. These articles were published between 2016 and 2025. When looking at the journals and authors, the most cited ones were Borsa İstanbul and Ozili PK (679 times), Yeni Siyasi Ekonomi and Babor D (365 times), Avrupa Finans and Demir A (293 times).

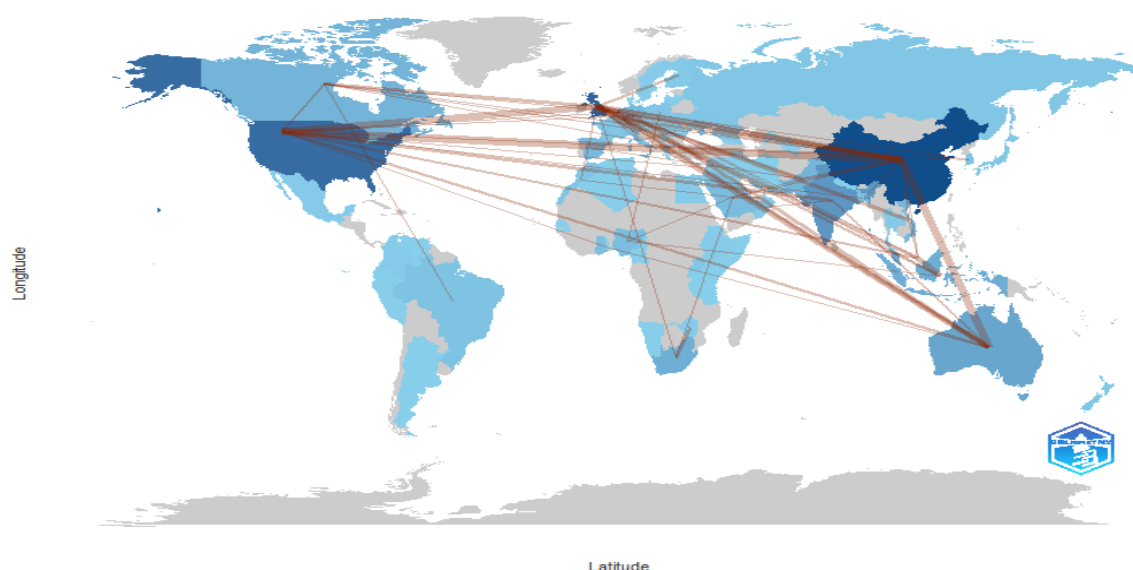
Table 2:Most Cited Documents

Author and Title	Total Citations
OZILI PK, 2018, BORSA ISTANB REV	679
GABOR D, 2017, NEW POLIT ECON	365
DEMIR A, 2022, EUR J FINANC	293
ARNER DW, 2020, EUR BUS ORGAN LAW REV	239
YUE P, 2022, FINANC RES LETT	203
SENYO PK, 2020, TECHNOVATION	162
LEONG C, 2017, INT J INF MANAGE	162
LIU H, 2022, ENVIRON SCI POLLUT RES	157
ZETZSCHE DA, 2020, J FINANC REGUL	149
MHLANGA D, 2020, INT J FINANC STUD	143
DEMIRGUC-KUNT A, 2020, WORLD BANK ECON REV	125
ALLEN F, 2022, J INT MONEY FINAN	121
JESUS LARIOS-HERNANDEZ G, 2017, BUS HORIZ	115
JI X, 2021, SUSTAINABILITY	113
CHEN L, 2016, CHINA ECON J	106
HASAN MM, 2022, GLOB BUS REV	105
YANG T, 2022, J BANK FINANC	102
HASAN M, 2021, FINANC INNOV	99
BERNARDS N, 2019, REV INT POLIT ECON-A	99
LAGNA A, 2022, INF SYST J	89
KASS-HANNA J, 2022, EMERG MARK REV	85
BANNA H, 2021, J INT FINANC MARK INST MONEY	84
BERNARDS N, 2019, REV INT POLIT ECON	77
FU J, 2022, J FINANC INTERMED	76

Source: Author's own creation based on the research data.

The collaboration map of the countries regarding the affiliation of the authors involved in the research on the impact of Fintech on financial inclusion is given in Figure 9. When the collaborations are taken into account, China emerged as the best collaborator with the United States (15 publications), the United Kingdom (10 publications), Australia (8 publications), Indonesia, Malaysia (6 publications), the United Kingdom, Australia (6 publications), and the Netherlands (6 publications).

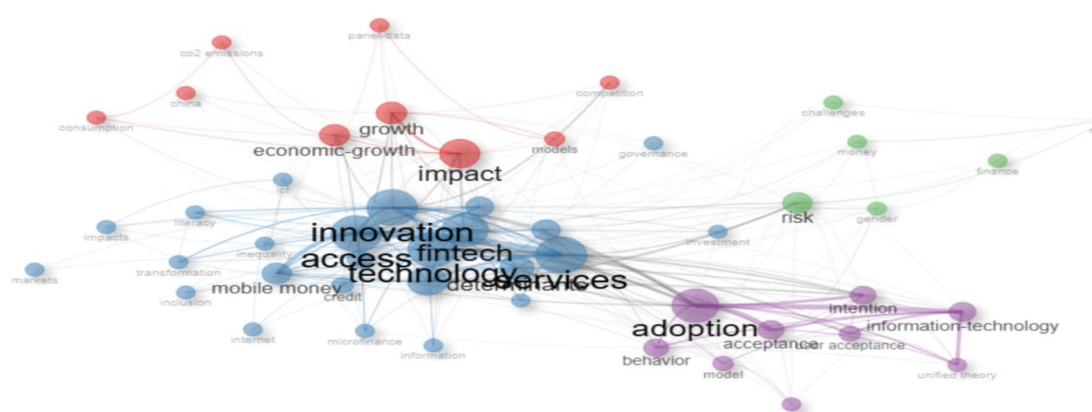
Figure 9:Country Collaboration Map



Source: Obtained by the author from Biblioshiny program

Figure 10 shows that there are 4 clusters that can be taken as research themes in the main theme area of the study. These clusters are formed around the concepts of adoption, risk, fintech and impact. The concept of adoption is widely used with information technology, acceptance, behavior, intention, user acceptance, model, the concept of risk with money, gender, market, difficulty and finance, the concept of fintech with innovation, access, technology, service, banking, poverty, credit, performance and mobile money, and the concept of impact with the concepts of growth, economic growth, competition and consumption.

Figure 10:Network of Keywords



Source: Obtained by the author from Biblioshiny program

Table 3 shows the frequency of use of words over time. The words access were used the most in 2020 and 2021, innovation in 2022 and 2023, fintech and innovation in 2024, and fintech in 2025.

Table 3: Words' Frequency Over Time

Year	fintech	innovation	access	impact	technology	services	banking	adoption	growth	economic-growth
2025	41	38	37	35	35	34	30	29	26	24
2024	36	36	35	28	30	33	26	28	25	23
2023	22	26	20	19	21	23	18	17	16	14
2022	12	15	11	4	13	14	11	12	12	6
2021	4	6	8	2	5	6	4	6	6	3
2020	3	3	5	1	2	4	3	1	4	1
2019	1	0	0	0	0	1	1	0	0	0
2018	1	0	0	0	0	1	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0

Source: Author's own creation based on the research data.

Table 4 shows the keyword trends of the authors from 2016 to 2025. Keywords allow easier access to the publications scanned by other authors on a subject basis. In the bibliometric analysis conducted with fintech and financial inclusion in the table, the first five keywords most used by the authors were determined as fintech (247 times), financial inclusion (195 times), financial access (37 times), mobile money (37 times) and financial technology (35 times).

Table 4: Author's Keywords

Words	Occurrences
Fintech	247
Financial inclusion	195
Financial Access	37
Mobile money	37
Financial technology	35
Inclusion	25
Digital financial inclusion	23
Financial literacy	22
Finance	17
Innovation	17
Digital finance	14
China	12
Development	12
Economic growth	12
G21	18

Source: Author's own creation based on the research data.

Conclusion

Financial inclusion has become important for the survival of economic systems, the reduction of poverty, and the balanced distribution of income. Financial inclusion can contribute significantly to narrowing wealth inequalities and increasing overall economic growth and stability (Ozili, 2018; Sahay et al., 2020). The literature review reveals the relevance and importance of the researched topic. The bibliometric analysis method used in this study on the concept of Fintech, which is expressed as financial technology, brings together the previous literature and related topics related to the research topic. The concept of Fintech has been given attention after 2016, and especially with the pandemic period in 2020, studies in this field began to be focused on. The research trajectory on the role of digital financial services in promoting financial access and economic development reflects the interest in this area, particularly since 2016 (Afjal, 2023). As is known, during this period, people's access to financial resources and

transactions without leaving their homes was realized thanks to technology. This mandatory situation, on the one hand, allowed new financial products to enter human life, on the other hand, it increased financial inclusion and allowed more people to benefit from financial markets.

In the study, bibliometric analysis of fintech and financial inclusion research topics was conducted in four different groups within the scope of 429 publications obtained from Web of Science between 2016 and 2025. In the first one, the connections of the articles with journals and the production information of the resources over time were discussed. Secondly, the production years, numbers, country information and collaboration information of the authors are included. Thirdly, citation information indicating the quality of the publication and the documents that are cited are determined. Fourthly, keyword information facilitating access to the publications, keywords of the authors and country collaborations are synthesized bibliometrically. The analysis reveals that Fintech does not only mean the use of technology in financial markets, but also that financial inclusion can be increased through technology-based financial products. In order to take advantage of the revolutionary potential of Fintech and create a more inclusive, sustainable and resilient financial ecosystem, it is important to support innovation, encourage responsible behavior and address regulatory gaps (Kishor et al. , 2024).

This study analyzed all studies on financial inclusion within the fintech main title. Therefore, fintech and financial inclusion as a subject determines the boundaries of the research as the Web of Science database. In future studies, studies can be conducted using databases such as Scopus and Science Direct to expand the literature. In addition, under the concept of financial literacy, training programs can be developed by policy makers on the benefits and use of fintech services related to technology literacy.

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