Mapping of FinTech Business: A Literature Review by Bibliometric Analysis

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Abstract

Financial technology, or FinTech, is technology and innovation for improves financial services in the industrial revolution and advanced technological age. Financial institutions such as banks, insurance agencies, stock brokerages, and investment firms now frequently employ cutting-edge technological tools to differentiate themselves from competitors and aid in the making of more informed business choices. FinTech growth has led to many studies in this field. Thus, this report presents FinTech trends. This study used Scopus data for bibliometric analysis. This study used 2005–2021 Scopus data. Excel, R studio, and VOS viewer were used for data visualisation. The study's findings were reported using bibliometric metrics to access publication and over the past twenty years in form of document, languages, sources, source title, specific area of subject, co-occurrence keyword analysis, authorship, active institutions, geographical distribution, and analysis of citation. The growing number of Fintech works shows the importance of technology in the financial service sector, which will affect the to achieve efficient economy and enhance public lifestyle.

Keywords: Financial Technology, publication, Scopus Database, authorship, FinTech

Introduction:

The delivery of financial services and solutions through the utilisation of technology is what is meant by the term "FinTech.". FinTech, as defined by (Ahmad et al., 2020), is an emerging category of technology businesses that offers a range of services to map with established banking intuitions and capital market participants. Companies were recommending fintech that was both rapid and adaptable, with innovative business practices. (Ahmad, et al., 2020) When it comes to the financial services industry, FinTech is not exactly cutting edge. They argue that FinTech merely means the application of technology to the financial sector. The banking industry was an early adoption of computers; in fact, the very first commercially used mainframe computers were created for a bank. Fintech includes innovations like the ATM, which was first introduced by Barclays Bank in 1967According to a former chairman of the Federal Reserve in the United States, the automatic teller machine (ATM) is the most significant financial invention he has witnessed in the previous 20 years since it helps people, saving them a trip to the bank office and offering a significant time saver. Since then, innovations like mobile banking, online banking, cryptocurrencies, and the blockchain have transformed the banking and finance industries.

Fintech now means finance and tech. Academics and researchers looked into topics such as internet of things, block chain, cyber security, cloud computing, , big data and data analytics, all of which have an

indirect impact on financial technology. Thus, this essay will review FinTech research and its development. Thus, this article presents the trajectory of the previous FinTech study and compares it to global development. This article continues as follows. First, we review bibliometric analysis literature and fintech research. This study's methods follow. The analysis and findings section shows Scopus database results. The conclusion provides summary, limits, and further study.

Literature Review:

According to (Figueiredo &Chunkhare, 2021) bibliometrics is frequently used to evaluate the quality of scientific research by conducting quantitative analyses of scholarly publications. Bibliometric analyses assume that most of the scientific scholarly breakthroughs and research results which were available in international or national scientific database, from where upcoming scholars can study and quote them in their study. According to a new study (Sweileh, 2020), according to the definition of bibliometrics as "the application of statistical and mathematical methods to books and other media of communication," bibliometric analysis has generally been used to assess the breadth (years wise) and depth (volume of publication) of a subject area's scholarly output, allowing scholars to spot patterns and trends in the field. According to a study (Sweileh et al., 2017), The use of bibliometric analysis as a method of reporting the development and results of research is gaining ground. according to research (Angarita-Saavedra, 2019) Publication types, citations, authors, impacts, and countries are some of the most often examined indicators in bibliometrics research.

FinTech bibliometric studies are prominent now a days; for example, (Takeda & Ito, 2021) studied 43 books/articles from a several databases and focused their study on three approaches: the review article on publication process; the attentiveness of scholarly publication in the definite journal; and the classification of published articles, which included FinTech itself, the disruptive innovation theory; FinTech and theories of economy or administration; and the regulator (Iluba& Phiri, 2021) mapped fintech articles from the ISI W. (Arner et al., 2017) examines FinTech ecosystems, research, and two of Finland's largest retail banks' innovation. Their findings show FinTech pioneers have multiple partnerships. All papers used Web of Science data for bibliometric analysis. this study usesd Scopus database for analysis.

Research Methods:

This study used April 2021 Scopus data. The article's title keywords "fintech" or "fintechs" or "fin-tech" or "fin-techs" were used to find fintech-related articles. We focus on paper titles because they reveal the study's goal and research field. (Jana, 2020) Since readers first see the title, it should include information that may catch their attention. The query yielded 449 documents for bibliometric analysis. There are tools to analyse bibliometric data. We used (1) R tudio and Microsoft Excel to determine the distribution of publications and create the necessary chart and graph, and (2) VOSviewer to build and visualise bibliometric networks for this paper.

Finding and Results:

Using information gleaned from Scopus, we conduct analyses of bibliometric features such publication year, publication growth, document and source type, field, keyword analysis, nation productivity, authorship,

active institution, and citation analysis. Frequency and percentage displays make up the bulk of the results. We report on the citation metrics and present the top 10 FinTech articles that earned the most citations by showing how the author's keywords are co-occurring in a map created with VOSviewer.

Main Information:

Description	Results
Time	2005:2021
Source	301
Documents	449
Annual Growth	3.93%
Document average age	2.02
Average citations per document	9.343
References	21,316
Keywords Plus	1227
Author's Keywords	1179
Authors	1119
Authors of single – authored docs	105
Single – authored docs	109
Co – Authors per Doc	2.69
International Co – authorship	18.04%

Publication growth

Year	Publication by year	Percentage (%)	Cumulative Percent (%)	Growth Rate (%)
2005	1	0.22	0.22	
2006	0	0.00	0.22	−100
2007	0	0.00	0.22	0
2008	1	0.22	0.44	0
2009	0	0.00	0.44	−100
2010	1	0.22	0.67	0
2011	1	0.22	0.89	0
2012	1	0.22	1.11	0
2013	0	0.00	1.11	−100
2014	2	0.45	1.56	0
2015	0	0.00	1.56	−100
2016	5	1.11	2.67	0

2017	19	4.23	6.90	280
2018	53	11.80	18.71	179
2019	59	13.14	31.85	11
2020	101	22.49	54.34	71
2021	111	24.72	79.06	10
2021	92	20.49	99.55	-17
2021	2	0.45	100.00	-98
Total	**449**	**100.00**		

Table: Publication Year with growth rate (annual)

The first essay on FinTech was written by Nayer, who used chit funds to examine how conventional financial technology and cutting-edge financial technology may coexist. The magazine relating to the FinTech topic has not developed much, and for a few years before the phrase became popularity in 2015, there was no such publication. The volume of publications has grown dramatically year after year the tablepresent The table shows the overall number of FinTech-related publications, as well as their percentages, cumulative percentages, and growth rates. A total of 111 publications, or over half of all FinTech publications, were published in 2021, the year with the highest number of publications as seen in the table. As the topic, which is related to business, is hotly contested and has a significant effect on the financial services sector, it is anticipated that the number will rise in 2021.
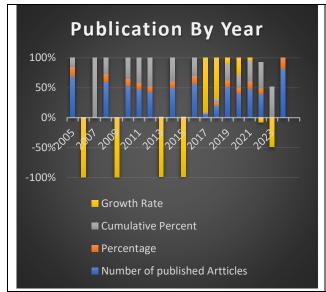

Figure1: Number of publications per year and published Articles with types of document on Fintech

Document and Source Type
Based on the document type, source type, and source title, we additionally analyse the documents we've pulled from the Scopus database. The type of document can be an editorial, book chapter, journal article, conference paper, review, or article. The image is a chart depicting the results of the study's examination of various types of documents. The article is responsible for more than half (270 out of 55%) of all published Fintech articles, which is next by conference papers (23%), books and reviews (7%), and then by the article itself.

Even though there are many different document types for articles published on

FinTech, our investigation also discovered multiple categories of source type. Table demonstrates that compared to conference proceedings and novels, journal articles are published the majority of the time.

Type of source	Published Articles in years	Percentage (N=449)
Journals	287	63.92
Conference Proceedings	92	20.49
Book	35	7.80
Book Series	32	7.13
Article	3	0.67
Grand Total	**449**	**100.00**

Table: Source Title

Additionally, a number of journals, proceedings, and books published the FinTech studies. Based on the requirement that each source title provide a minimum of 5 publications, the following table lists the top source titles where articles about fintech have been published. The data shows that the Economist United Kingdom is the country with the most FinTech papers.

Sources	Total Publication	Percentage % (N=449)
Lecture Notes In Networks And Systems	14	3.1
Acm International Conference Proceeding Series	11	2.4
Perspectives In Law, Business And Innovation	7	1.6
Sustainability (Switzerland)	6	1.3
Journal Of Risk And Financial Management	5	1.1
Proceedings Of The Annual Hawaii International Conference On System Sciences	5	1.1
Advances In Intelligent Systems And Computing	4	0.9
Financial Innovation	4	0.9
Iop Conference Series: Earth And Environmental Science	4	0.9
Notes For A Computer Science Lesson (Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics)	4	0.9
Proceedings Of The International Conference On Industrial Engineering And Operations Management	4	0.9
Technological Forecasting And Social Change	4	0.9

Advances In Science, Technology And Innovation	3	0.7
Electronic Commerce Research And Applications	3	0.7

Table: Top Source Title with publication details

Subject Area

This table summarises the distribution of research study on FinTech, which primarily arises from econometrics and finance (161 & 33%), science (197 & 41%), and business, .

management (218 & 45%). Articles on FinTech have been published in the social sciences, engineering, decision sciences, and mathematics, among others

Subject	**Published Articles**	**Percentage % (N = 449)**
Business, Management and Accounting	103	22.94
Computer Science	80	17.82
Economics, Econometrics and Finance	55	12.25
Social Science	50	11.14
Engineering	40	8.91
Mathematics	30	6.68
Environmental Science	15	3.34
Energy	10	2.23
Materials Science	9	2.00
Biochemistry, Genetics and Molecular Biology	9	2.00
Physics & Astronomy	8	1.78
Medicine	7	1.56
Psychology	5	1.11
Chemical Engineering	4	0.89
Earth & Planetary Science	4	0.89
Pharmacology, Toxicology and Pharmaceutics	4	0.89
Agricultural and Biological Science	3	0.67
Chemistry	3	0.67
Health Professions	2	0.45

Table: Subject Area (Few Documents are classified in more than one subject area)

Keywords Analysis

WordSift was used in this study's initial word cloud creation to represent the author's keywords. displays the results of the word cloud with a scale setting of n and a maximum of 100 words. The statistic showed the top 100 keywords (or keyword phrases) from the FinTech article. Each word's size serves as a barometer for the overall frequency of the keywords. Along with the term used to search the document's title, the word cloud also shows other recently popular terms like technology, financial, innovation, digital, service, payment, banking and block chain. Other keywords, however rare in number, are important since they have been used to address the FinTech research issue.The fact that every word generated in Figure is one that is often used in FinTech research must be emphasised. We may therefore assume that future FinTech research will likely focus on these key words.(Aidi Ahmi, Afiruddin Tapa, Ahmad Husni Hamzah, 2020)

(Gencay Tepe, Umut Burak Geyikci, Fatih Mehmet Sancak , 2020)

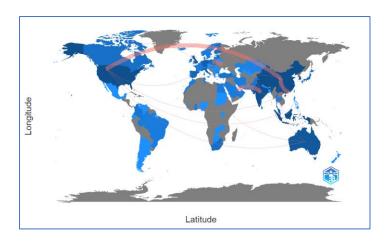*Figure : Word cloud of the author keywords*

We perform additional analysis on the author's keyword co-occurrences using VOS viewer. VOS viewer is a piece of software for building and displaying bibliometric networks. A network visualisation of the authors' keywords was constructed using VOS viewer, as seen in Figure 4. The colour, size of the circles, typeface, and thickness of the connecting lines are all indicators of how nearly associated the keywords are to one another. Similar colours suggest keywords According to the affiliation of the authors, 33 different countries have contributed to the FinTech publications as a whole. It will be counted as one (1) from China and one (1) from the UK, for instance, if the article has four co-authors, two of which are from China that are closely connected and commonly used together. The blue-colored computer science, bitcoin, blockchain, financial services industries, artificial intelligence, and computer applications, for instance, all are implied to be closely associated and commonly co-occur.

Figure : Co-occurrence analysis of the author keywords

Geographical Distribution of publication

and the other two are from the United Kingdom. The United States generated the most publications, then followed by Indonesia, China, United Kingdom, Germany, and South Africa, according to the findings.

The number of authors per document is displayed in the Table. While 135 (30%) documents are single-authored, the remaining 314 (70%), or publications with TABLE. Number of Authors per Document

multiple authors (varying from 2 to 10), are reported. There are 20 documents whose authors are unknown.

Author	Freq.	Percentage% (N=449)	Total
0	20	4.45	0
1	135	30.07	135
2	120	26.73	250
3	79	17.59	309
4	45	10.02	256
5	25	5.57	115
6	10	2.23	54
7	5	1.11	28
8	5	1.11	32
9	4	0.89	10
10	1	0.22	5
Total	449	100.00	1194

Citation Analysis

Additional measures of a researcher's productivity include the number of citations and the number of citations per year. The citation metrics of the documents that were retrieved till April 2021 are summarised in

Table 9. Table 10 lists all retrieved documents' cumulative citation counts together with the average number of citations each year. As shown, 449 retrieved articles have received a total of 1756 reported citations over the course of 18 years (2005-2021), for an average of 56.22 citations per year.

Metrics	Data

Publication Years	2005-2021
Citation Years	18
Papers	449
Citations	1756
Cites per year	56.22
Cites per Paper	9.343
Authors per paper	2.69
h – index	20
G – index	35

TABLE: Citations Metrics

According to the Scopus database, this table lists the top 10 articles that have been mentioned the most times. The article by Gomber p and j Manage INF Syst with the title "On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services" has so far earned the most citations (365 citations/ an average of 73 citations per year). The publications by Anagnostopoutos, J Econ, and Milian EZ, Elect CommerResappl, however, are among the most significant articles based on the number of citations each year, receiving 26.8 and 30.5 citations per year, respectively.

No.	Authors	Title	Total Citation	Citation per year
1.	GOMBER P, 2018, J MANAGE INF SYST	On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services	365	73
2.	GOMBER P, 2017, J BUS ECON	Digital Finance and FinTech: current research and future research directions	321	53.5
3.	AU YA, 2008, ELECT COMMER RES APPL	The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application	282	18.8
4.	OZILI PK, 2018, BORSA ISTANB REV	Impact of digital finance on financial inclusion and stability	254	50.8

5.	ANAGNOSTOPOULOS I, 2018, J ECON BUS	Fintech and regtech: Impact on regulators and banks	134	26.8
6.	MILIAN EZ, 2019, ELECT COMMER RES APPL	Fintechs: A literature review and research agenda	122	30.5
7.	CHEN Y, 2020, J BUS VENTUR INSIGHTS	Blockchain disruption and decentralized finance: The rise of decentralized business models	111	37
8.	GIMPEL H, 2018, ELECTRON MARK	Understanding FinTech start-ups – a taxonomy of consumer-oriented service offerings	95	19
9.	GOZMAN D, 2018, J MANAGE INF SYST	The Innovation Mechanisms of Fintech Start-Ups: Insights from SWIFT's Innotribe Competition	94	18.8
10.	MCDONALD RM, 2020, ADM SCI Q	Parallel Play: Startups, Nascent Markets, and Effective Business-model Design	91	30.3

Conclusion

A review of all forms of academic articles on fintech has begun with this work. To report the trend of prior studies, the study uses a few bibliometric indicators extracted from the Scopus database. Overall, 449 documents' bibliometric information was taken from the Scopus database. According to the findings, interest in FinTech began to grow in 2015 and will peak drastically in 2021. The journal published the majority of the papers, making English the dominant tongue. While just 30% of documents are solely the work of one author, 70% of documents are the work of two - four authors. The data also shows a steady increase in the typical number of authors per document. Regarding the number of authors who contributed, China reported having the most, followed by Indonesia, Japan, and the USA. Other Asian countries have made significant contributions to the body of knowledge in this field of research, in addition to Indonesia. The main problems in FinTech come from computer science, econometrics, economics, finance, and management. The subject is also of interest to other academic disciplines, including as the social sciences, engineering, decision sciences, and mathematics. According to this analysis, both the average number of writers per document and the number of publications per year have risen over time. This pattern in some ways shows growing author collaboration in this area. Despite the article's interesting observations, readers should be aware of a few restrictions. First, this study utilised specific search terms and phrases to locate the original list of scholarly publications that Scopus had indexed. However, previous bibliometrics-related

studies have extensively utilised this methodology.One of the biggest online databases, Scopus indexes all academic publications, although it leaves out some sources. Therefore, it is absolutely reasonable to anticipate some exclusions from this study. In addition, there is no search word that can adequately encompass all the academic articles in this area. Inaccurate outcomes, both favourable and negative, are thus constantly anticipated. Second, the term "FinTech" has only recently begun to be used.There is a possibility that earlier research on several subjects that focused on financial technology. The phrase "FinTech" was not used specifically, though. As a result, these studies were left out of the analysis. Despite these shortcomings, this report provides a bird's-eye picture of the current state of the global FinTech research trend.

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