

Article

Fintech as a Financial Disruptor: A Bibliometric Analysis

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Abstract: The present-day financial system is being influenced by the rapid development of Fintech (financial technology), which comprises technologies created to improve and automate traditional forms of finance for businesses and consumers. The topic of Fintech as a financial disruptor is gaining popularity in line with the swift spread of digitalization across the banking industry, whereby this paper contributes to the field by presenting a novel bibliometric analysis of the academic literature related to Fintech as a financial disruptor. The analysis is based on metadata extracted from the Scopus database through the VOSviewer and Biblioshiny software. The bibliometric analysis of 363 documents identifies the most impactful sources of publication, keywords, authors, and most cited documents on the topic of Fintech as a financial disruptor. As our analysis demonstrates, the number of publications on the given topic is increasing, indicating both interest among academia and potential for future research.

Keywords: Fintech; disruption; transformation; bibliometric analysis



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1. Introduction

Fintech, referring to financial technologies, can be defined as exploiting innovative technologies to deliver financial services (Cai, 2018 [1]). The term is broad and suggests a digital product, a startup or even a legacy provider (PwC, 2016) [2]. Fintech has gained momentum in the last quarter of the 20th century and has been rapidly expanding across the globe. The outbreak of the COVID-19 pandemic, while negatively affecting many industries, became a catalyst for the rapid digitalization of various businesses, including financial services. According to Deloitte (2020) [3], the pandemic contributed to the generation of the second wave of development and penetration of new financial technologies into traditional sectors. Since September 2018, the performance of Fintech company shares has outperformed that of their traditional counterparts, and the gap has increased significantly since the outbreak of COVID-19 (Deloitte, 2020) [3]. According to Statista (2021) [4], total investments in Fintech reached USD 33.9 billion by the first quarter of 2019. Moreover, almost 75% of global consumers had some interaction with Fintech in 2019 (Statista, 2021) [4], while Deloitte (2020) predicts that the global revenue of Fintech companies will grow by 11.7% from 2019 to 2024.

The rapid expansion of Fintech companies has been achieved by successfully targeting unbanked customers, which incumbent financial institutions often overlook. At the same time, through the digitalization of financial services, Fintech has been targeting a broader customer base through providing more convenient, diverse, and affordable financial services. Thus, innovation and new business models have allowed Fintech to spread across the industry and enter the customer segment of the existing financial service providers. Hence, Fintech represents an excellent illustration of the disruptive innovation theory, introduced by Clayton, M. Christensen in 1995 (Christensen & Euchner, 2015) [5]. According to this theory, disruptive innovation is a process that occurs when a small enterprise with limited resources enters the market by targeting customers neglected by incumbents. In doing so, the small enterprise adopts innovative solutions and gradually expands its customer base into the business of the incumbent enterprise (Christensen & Euchner, 2015) [5].

Similarly, Fintech creates a customer-centric environment, disrupting the traditional product orientation of incumbent banks (Siek & Sutanto, 2019) [6]. According to Deloitte (2021) [7], Fintech has already laid the ground for further successful industry disruption, whereby 86% of financial institutions believe that Fintech threatens various areas of their business (Lee & Shin, 2018) [8]. Moreover, Gomber et al. (2018) [9] argue that drastic changes in financial services signal a looming financial revolution. Technology innovation, process disruption, and transformation of services are the main driving forces behind such a revolution (Gomber et al., 2018) [9]. The recent rapid advancement of the Metaverse leads to further technological and financial disruption (Sahni & Lyne-Smith, 2022) [10]. Anticipating the growing interest in academia in researching the disruption of the incumbent financial system by the rapid advancement of Fintech, this paper aims to identify the scope, the main contributors and the sources shaping research in the field of Fintech.

The paper presents a bibliometric analysis to approach the topic of Fintech as a financial disruptor. Bibliometric analysis is a relatively new research method that has gained popularity in several academic fields, including finance. It is part of a broader scientometrics discipline, defined as the study of quantitative features of science and scientific research (Biancone et al., 2020) [11]. The methodology of bibliometric analysis implies the processing of bibliometric data, such as sources of publications or documents, using quantitative techniques (Donthu et al., 2021) [12]. Since the number of academic publications is increasing exponentially, evaluating the content of the relevant literature has become a highly laborious process. The various visualization techniques allow us to simplify the process of reviewing related academic literature (Borner et al., 2003) [13]. For example, bibliometric analysis allows for the better envisioning and grasping of a research topic through the systematization of the relevant academic literature (Aria & Cuccurullo, 2017) [14].

Consequently, the researcher can effectively sort the information through visual mapping of the published literature. Moreover, this type of analysis allows for the easy identification of critical research trends and the most cited authors and papers within the large pool of academic publications on any given subject. Thus, bibliometric analysis assists in retrieving and classifying relevant information (Borner et al., 2003) [13]. Furthermore, several scholars (Shibata et al., 2008; van, 2006) [15,16] have discussed and demonstrated the significance of bibliometric analysis in determining emerging trends and themes of future research. Thus, an analysis similar to the one conducted in this paper can be a useful resource for researchers.

The range of newly developed and specialized software allows for the convenient and effective execution of bibliometric analysis. The open-source bibliometrix R-package, used in this paper, allows data analysis to be run and provides data visualization through different types of mapping (Aria & Cuccurullo, 2017) [14]. It offers various statistical and graphical techniques to analyze the existing academic literature; for example, the presentation of scientific collaboration units can be performed by citation and co-citation analysis (Janik et al., 2020) [17].

VOSviewer is another software program that can help with the visualization of bibliometric analysis results. This software works with different data sources and generates data-reflecting images with various features. The software organizes data into clusters represented by nodes and connected lines (Janik et al., 2020) [17]. VOSviewer's clustering technique is based on the local smart moving algorithm introduced by Waltman and Van Eck (Janik et al., 2020) [17]. This algorithm allows for the construction of connected networks based on the selected data. Generated by the software, the networks of authors, citations and countries are presented as maps. This paper uses Biblioshiny (the web-interface of the bibliometrix R-package available online for free) [14] to generate figures and VOSviewer (version 1.6.16) [16] for mapping presentations to perform a comprehensive bibliometric analysis.

The growing number of scholarly publications on the subject of Fintech has generated several bibliometric analyses. While some studies have covered the literature on Fintech in

general (Wu, 2017, [18] Chen & Peng, 2019, [19] Sarhan, 2020 [20]), a growing number of bibliometric analyses concentrate on specific areas of Fintech, such as Fintech regulations (Lakhe & Kulkarni, 2020) [21], crowdfunding (Martínez-Climent et al., 2018, [22] Buttice & Ughetto, 2021 [23]), Fintech and Islamic finance (Aysan et al., 2022; [24] Abubakr & Aysan, 2022 [25]) and cryptocurrencies and blockchain (Firdaus et al., 2019; [26] Jiang et al., 2021; [27] Nasir et al., 2021; [28] Dosso & Aysan, 2022; [29] Aysan et al., 2021 [30]). Nevertheless, to the best of the authors' knowledge, the academic literature on Fintech as a financial disruptor has not been reviewed bibliometrically. Consequently, at the time of writing, this work is the first one to present a bibliometric analysis on the given topic, contributing towards the originality of the work. This paper attempts to fill this gap by exploring the extant literature on Fintech as a disruptor and transformer of the incumbent financial system. Through the analysis performed on Biblioshiny and VOSviewer, the paper attempts to answer the following research questions: What is the scope of the academic literature on the given topic? What are the main contributors towards the given topic? What are the main trends within the given topic?. The authors believe that the topic of Fintech as a financial disruptor is an emerging but promising area of research, and this paper can be a good starting point in this endeavor.

The paper is organized as follows. Section 2 discusses the data collection and methodology. Section 3 presents the results of the bibliometric analysis, including an overview of the extant literature, document types, trending words and evaluation of the authors' impact. A discussion of the results of the bibliometric analysis, as well as the conclusions, is provided in Section 4.

2. Methodology and Data Collection

2.1. Data Collection

To conduct the bibliometric analysis, the authors chose the Scopus database due to its robust reputation as a leading multidisciplinary abstract and citation database. Scopus, which is part of the larger Elsevier analytics and information company, provides easy access to academic peer-reviewed publications, including books, journals and conferences. Metadata used in this paper can be defined as basic summarized information about the data (Opendatasoft, 2016) [31]. The publishers provide metadata, which includes the author(s), affiliation(s), document title, year, electronic identification (EID), source title, volume/issue/pages, citation count(s), source, document type and digital object identifier (DOI), among others. According to the Elsevier website, the Scopus content repository stores 3.7 TB of data, corresponding to 1.4 billion cited references. Considering the above-mentioned information, Biancone et al. (2020) [11] state that the Scopus database provides a high-quality and reliable basis for bibliometric analysis.

The bibliometric analysis in the paper represents a snapshot of the research data on the topic of Fintech as a financial disruptor, as retrieved on 24 February 2021. To collect the applicable data, the following keywords were entered into the Scopus database: "Fintech" OR "FinTech" OR "Financial technologies" AND "Disrupt*" OR "Transform*". An asterisk (*) was added after the words "disrupt" and "transform" to allow for a wider variety of these words. The search was conducted on the titles, abstracts and keywords of published articles in the Scopus database. All types of documents, such as articles, book chapters, conference papers, books and reviews, were included in the analysis. Publications were limited to those published in English in their final publication stage. The output dataset of 363 documents was extracted in .csv format to run analysis in VOSviewer, and in .bib format for analysis in Biblioshiny.

2.2. Methodology

To answer the research question, the paper employs three types of techniques of bibliometric analysis: performance analysis, science mapping and network analysis (Donthu, 2021) [12]. The performance analysis defines the contribution of research factors (authors, journals, countries) towards the topic of Fintech as a financial disruptor based on the

number of relevant publications and citations (Donthu, 2021) [12]. This technique defines the most cited or productive journals, authors and papers. Counting citations and publications aids in defining the significance of the research topic, scholar and journal (Shibata et al., 2008) [15]. Applying the science mapping technique, the paper demonstrates the relationship among different research factors on the given topic. This technique defines the relationship among publications, foundational themes and relationships among topics, employing citation and co-citation analysis, and co-word and co-authorship analysis, among others (Donthu, 2021) [12]. Finally, the last technique, network analysis, allows the visualization of various results through clustering and network metrics. The following diagram (Figure 1) demonstrates the methodological process of data extraction and bibliometric analysis.

Data mining and extraction	
Scopus	Entering the keywords (“Fintech” OR “FinTech” OR “Financial technologies” AND “Disrupt*” OR “Transform*”)
	363 documents were extracted
Tools	
Process	Bibliometric Analysis
Outcome	Performance analysis
Scopus	Total publications
Scopus	Number of active years of publications
Scopus	Number of contributing authors
Scopus	Productivity per active year of publication
Scopus	Total citation
Scopus	Collaboration index
Scopus	Number of cited publications
Biblioshiny	h-index
	Science mapping
Biblioshiny	Relationship among publications
Biblioshiny	Most influential publications
Biblioshiny	Foundational themes
Biblioshiny	Existing or future relationship among topics
Biblioshiny, Vosviewer	Written content (words)
Biblioshiny, Vosviewer	Relationships among authors
Biblioshiny, Vosviewer	Authors and author affiliations
	Network analysis
Biblioshiny	Degree of centrality
Vosviewer	Clustering
Vosviewer	Visualization

Figure 1. Overview of the working process.

The results of the bibliometric analysis and discussion around these results are presented in the following sections.

3. Results of the Bibliometric Analysis

The number of the extracted documents might not be large due to the novelty of the given topic; however, the publications of bibliometric analyses conducted on similar emerging topics, such as Open Banking and Non-Fungible Tokens, prove that the scope of the documents is sufficient (Briones de Araluze & Cassinello Plaza, 2022; [32] Nobanee & Ellili, 2022 [33]). The conducted search resulted in 363 documents, which represented 18% of publications related to Fintech, as identified when searching for keywords of “Fintech” OR “financial technology” (1963 publications). The resultant number reflects the substantial academic interest in the topic of Fintech as a financial disruptor. The general information about the collected data is presented in Table 1, which shows that most of the identified documents are articles (46% of all documents) and conference papers (33%). Books constitute only 2% of all documents, which might indicate the relative novelty of the topic.

Table 1. Main information about the data, timespan 1984–2021.

Description	Results
Document types	
Article	166
Book	9
Book chapter	39
Conference paper	120
Conference review	4
Editorial	6
Review	19
Document contents	
Keywords plus (ID)	1207
Author’s keywords (DE)	1029
Authors	
Authors	896
Author appearances	970
Authors of single-authored documents	83
Authors of multi-authored documents	813
Authors collaboration	
Single-authored documents	91
Documents per author	0.405
Authors per document	2.47
Co-authors per document	2.67
Collaboration index	2.99

Source: Scopus, elaborated in Biblioshiny.

While no restriction was applied to the timespan of the published documents, the results yielded documents with the combination of words shown in Section 2.2 from 1984 to 2021. According to the Scopus search results, the earliest article that included the terms “Fintech” and “disruption”/“transformation” was “Meeting the challenge of Fintech startups: The development of dynamic capabilities at incumbent banks” by Muthukannan and Gozman (1984) [34]. The next paper was by Seibel and Khadka, titled “SHG banking: A financial technology for very poor microentrepreneurs”, published in the journal *Savings and Development* (Seibel & Khadka, 2002) [35]. At this early stage, from 1984 to 2016, the number of publications was insignificant, after which their quantity started to increase and it reached its peak in 2020 (Figure 2). Despite a slow start, the annual growth in the number of publications accelerated after 2016 and almost doubled in 2020 on a year-on-year basis.

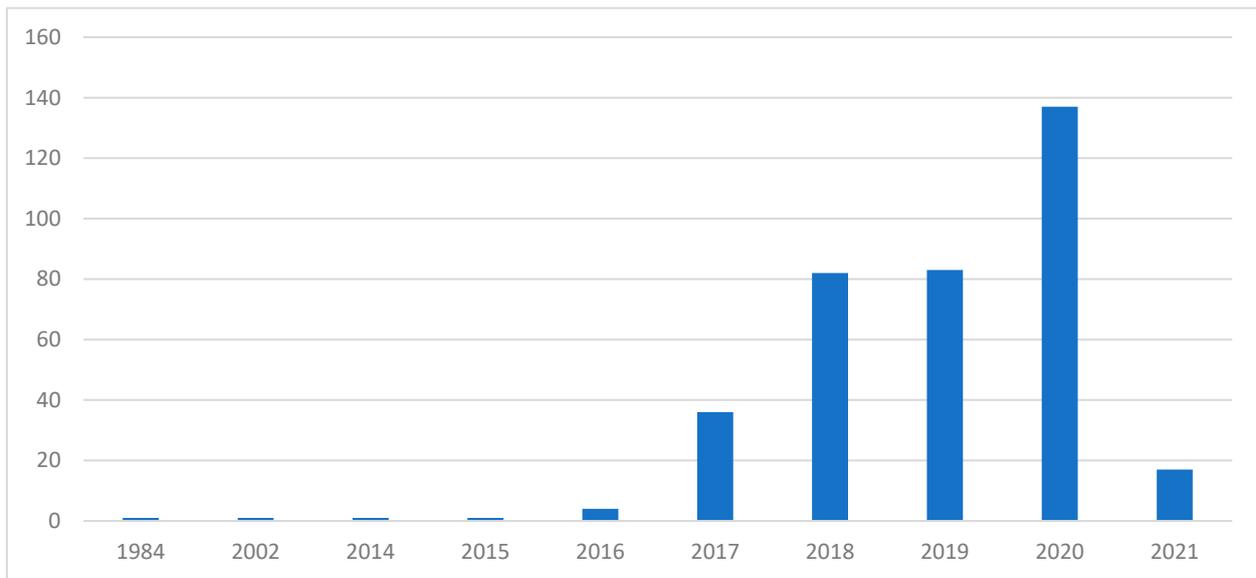


Figure 2. Annual scientific production. Source: Scopus, elaborated in Excel.

3.1. Analysis of the Sources of Publications

3.1.1. Subject Areas of Publications

As anticipated, the subject of Fintech as a financial disruptor is diverse and includes various areas (see Table 2). The majority of publications (22%) are in the area of Computer Science, followed closely by Business, Management and Accounting (19%), and Economics, Econometrics and Finance (13%). This distribution confirms PwC's definition of Fintech as a combination of technology and financial services, in which it is difficult to define where the technology ends and financial services begin (PwC, 2016) [2].

Table 2. Subject areas of the publications.

Subject Area	# of Results	%
Computer Science	165	0.22
Business, Management and Accounting	144	0.19
Economics, Econometrics and Finance	98	0.13
Social Sciences	80	0.11
Engineering	77	0.10
Decision Sciences	51	0.07
Mathematics	31	0.04
Environmental Science	27	0.04
Energy	24	0.03
Biochemistry, Genetics and Molecular Biology	6	0.01
Earth and Planetary Sciences	6	0.01
Pharmacology, Toxicology and Pharmaceutics	5	0.01
Physics and Astronomy	5	0.01
Materials Science	4	0.01
Multidisciplinary	4	0.01
Psychology	4	0.01
Others	12	0.02

Source: Scopus, elaborated in Excel.

3.1.2. Most Cited Sources of Publications

Figure 3 presents the twenty most cited sources of publications about Fintech as a financial disruptor. The darker shade of blue defines the higher number of citations. The lighter is the shade, the smaller is the number of citations. The three most cited sources are the *Journal of Management Information Systems*, *Management Information Systems Quarterly*

(*MIS Quarterly*) and the *Harvard Business Review*, each with more than 60 citations in this analysis. The first two journals cover research in management information systems and information technologies, once again defining Fintech as “technology” rather than “finance”. Overall, the publication of documents in reputable journals such as the *Harvard Business Review* and *Journal of Management Information Systems* confirms the interest of academia in the given topic.

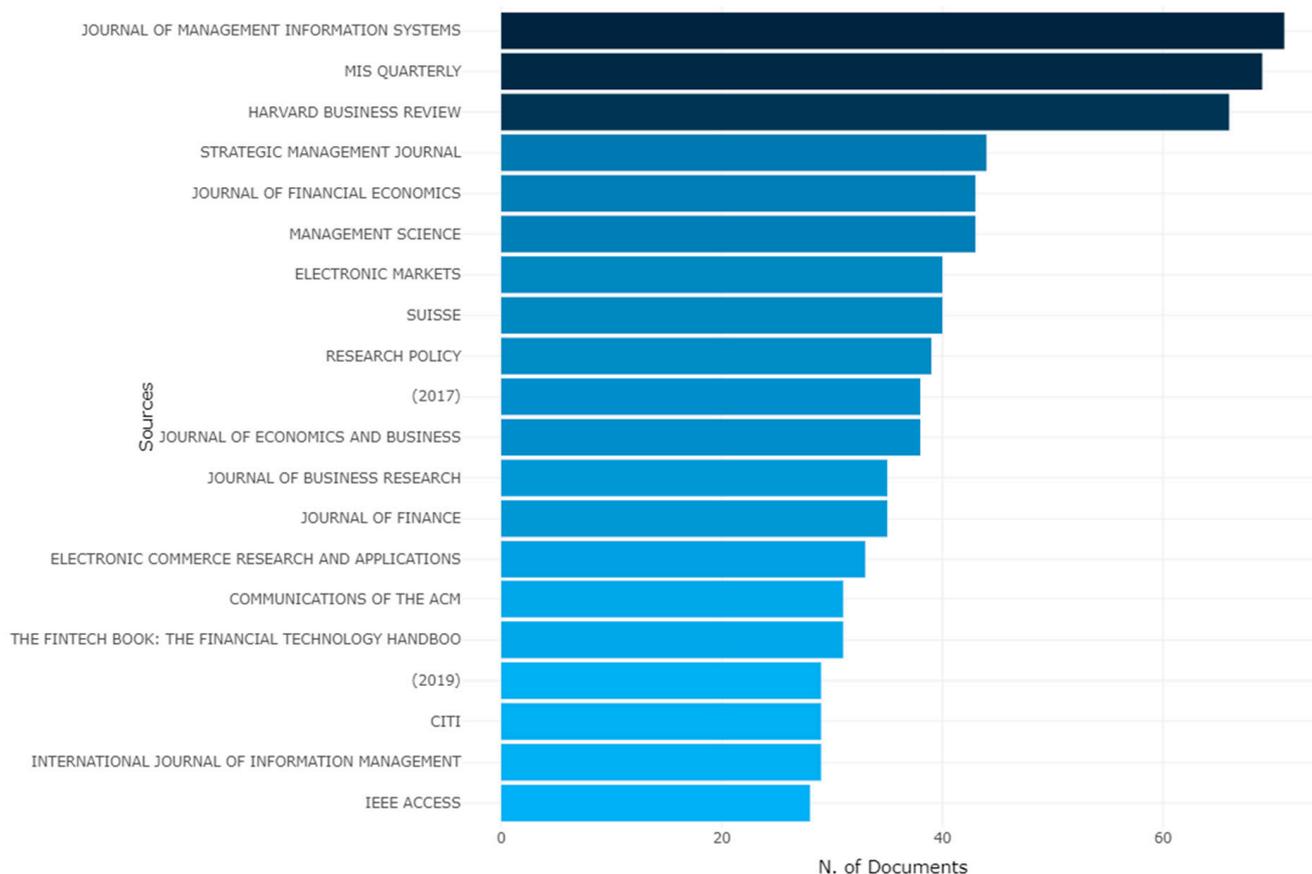


Figure 3. Most cited sources of publications. Source: Scopus, elaborated in Biblioshiny.

3.1.3. Most Productive Sources of Publications

Figure 4 presents the twenty most productive sources of publications with the largest number of documents on the given topic. Interestingly, the most cited sources (as shown in Figure 2) are not included in Figure 3. For example, the most cited source, the *Journal of Management Information Systems*, published only two documents on the given topic. However, it was cited in 71 papers. On the other hand, the *ACM International Conference Proceeding Series* published 11 articles on the chosen topic but has been cited in only one document. Hence, the quantity of publications does not necessarily reflect the number of citations.

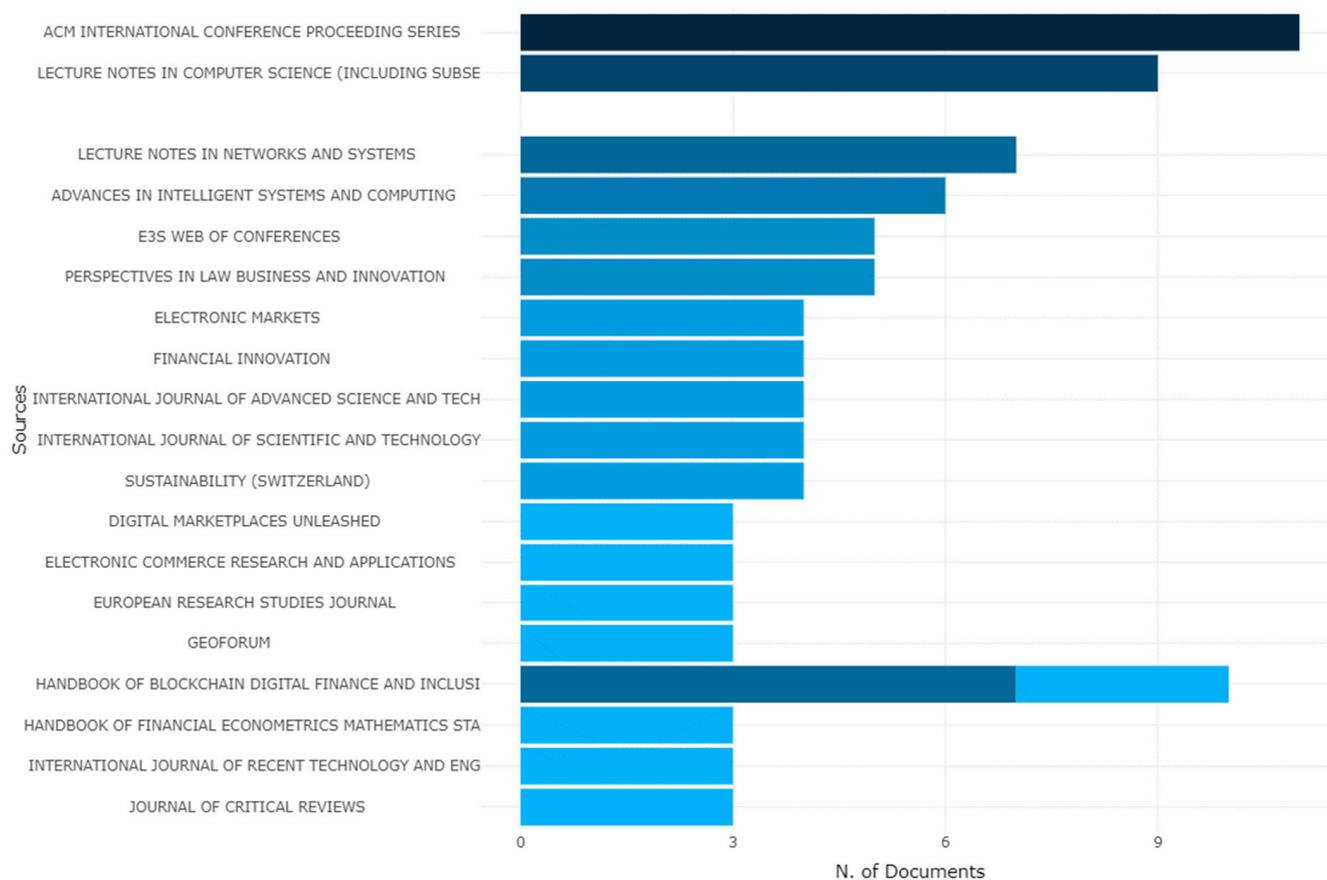


Figure 4. Most relevant sources. Source: Scopus, elaborated in Biblioshiny.

3.2. Analysis of the Documents

3.2.1. Most Cited Documents

Figure 5 presents the list of the most cited documents on Fintech as a financial disruptor [1,8,9,36–52]. The most cited article was by Lee and Shin, “Fintech: Ecosystem, business models, investment decisions, and challenges” (Lee & Shin, 2018) [8]. The article was published in 2018 in the *Business Horizons* journal and generated 128 citations. The article discusses different Fintech business models, as well as the challenges of Fintech startups and incumbent financial institutions. The second most cited article (with 126 citations) was “On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services” by Gomber, Kauffman, Parker and Weber (2018) [9].

The VOSviewer map of document citations (Figure 6) groups the 73 most cited documents into 17 clusters. The size of the bubble illustrates the number of citations, while its color refers to the year in which the document was published. As mentioned earlier, the most cited documents of Lee and Shin [8] (128 citations) and Gomber et al. [9] (126 citations) were published in 2018, which allowed sufficient time to produce a high number of citations. The earliest of the most cited documents was “How signaling and search costs affect information asymmetry in P2P lending: the economics of big data” by Yan, J. et al., [53] which was published in 2015, generating 28 citations (Yan et al., 2015) [53]. The most recent of the most cited documents was “Blockchain disruption and decentralized finance: The rise of decentralized business models” by Chen and Bellavitis, which was published in 2020 in the *Journal of Business Venturing Insights* and has already gained 23 citations.

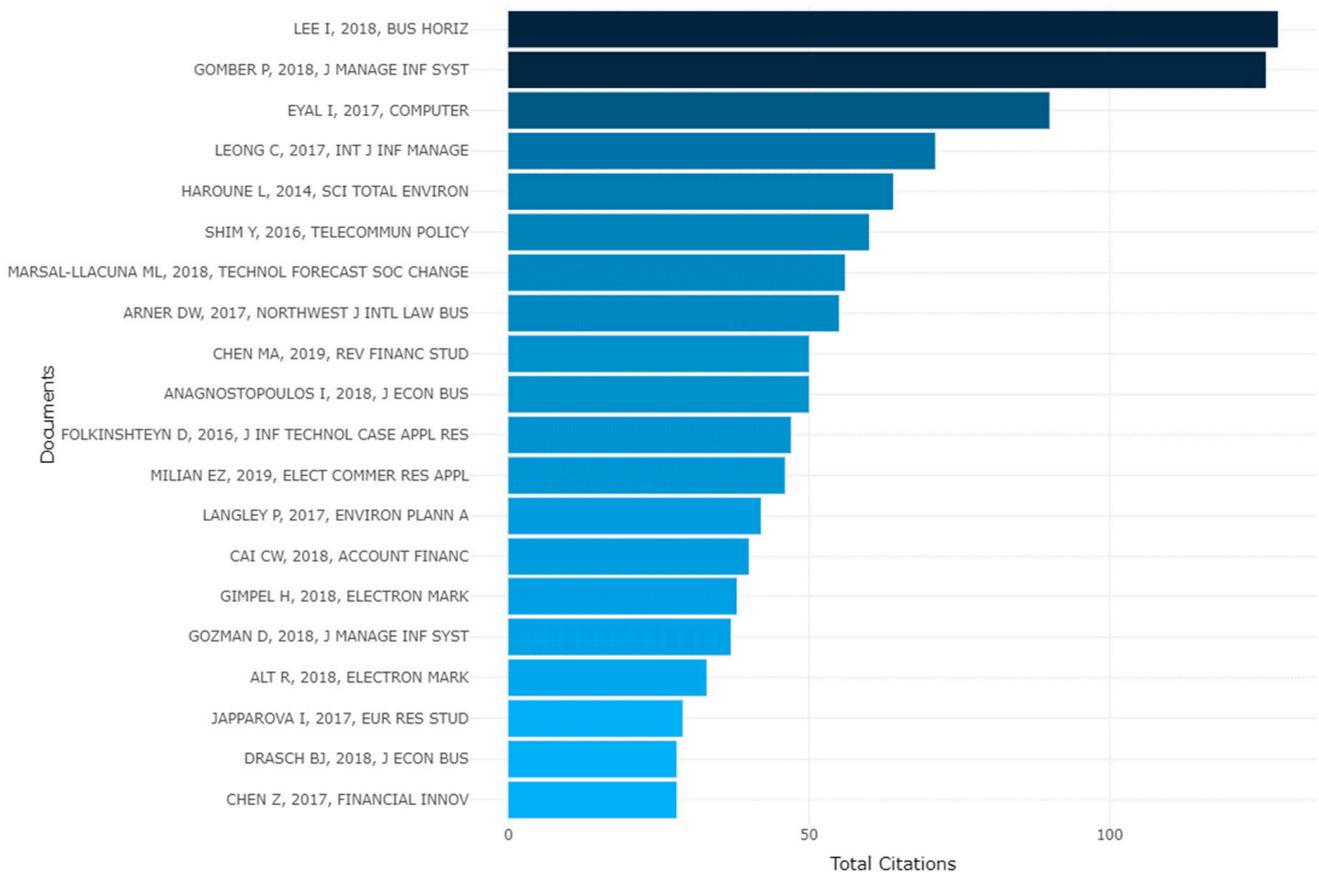


Figure 5. Most cited documents. Source: Scopus, elaborated in Biblioshiny.

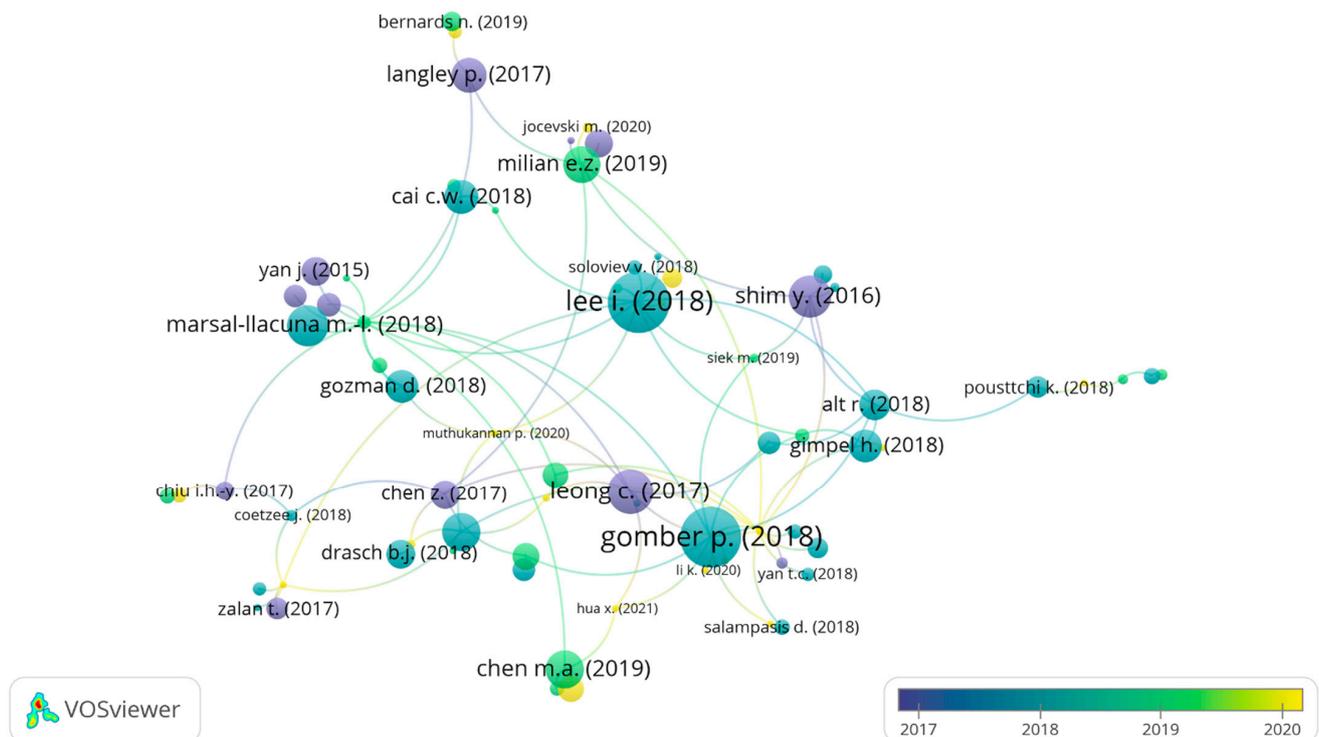


Figure 6. Citations of the documents. Source: Scopus, elaborated in VOSviewer.

3.2.2. Most Used Keywords

Figure 7 presents the 20 words most frequently used by the authors. As expected, the word “Fintech” was the most popular, with a frequency of 155 (25%). “Blockchain” and “digital transformation” followed, with corresponding frequencies of 53 and 22 (8% and 3%). The words “disruption”, “disruptive innovation” and “digital disruption” were not used frequently and together comprised 3% of the 20 most frequently used words. The analysis of the most frequently used words indicates that despite certain interests, there is scope for further academic research in the area of Fintech as a financial disruptor.

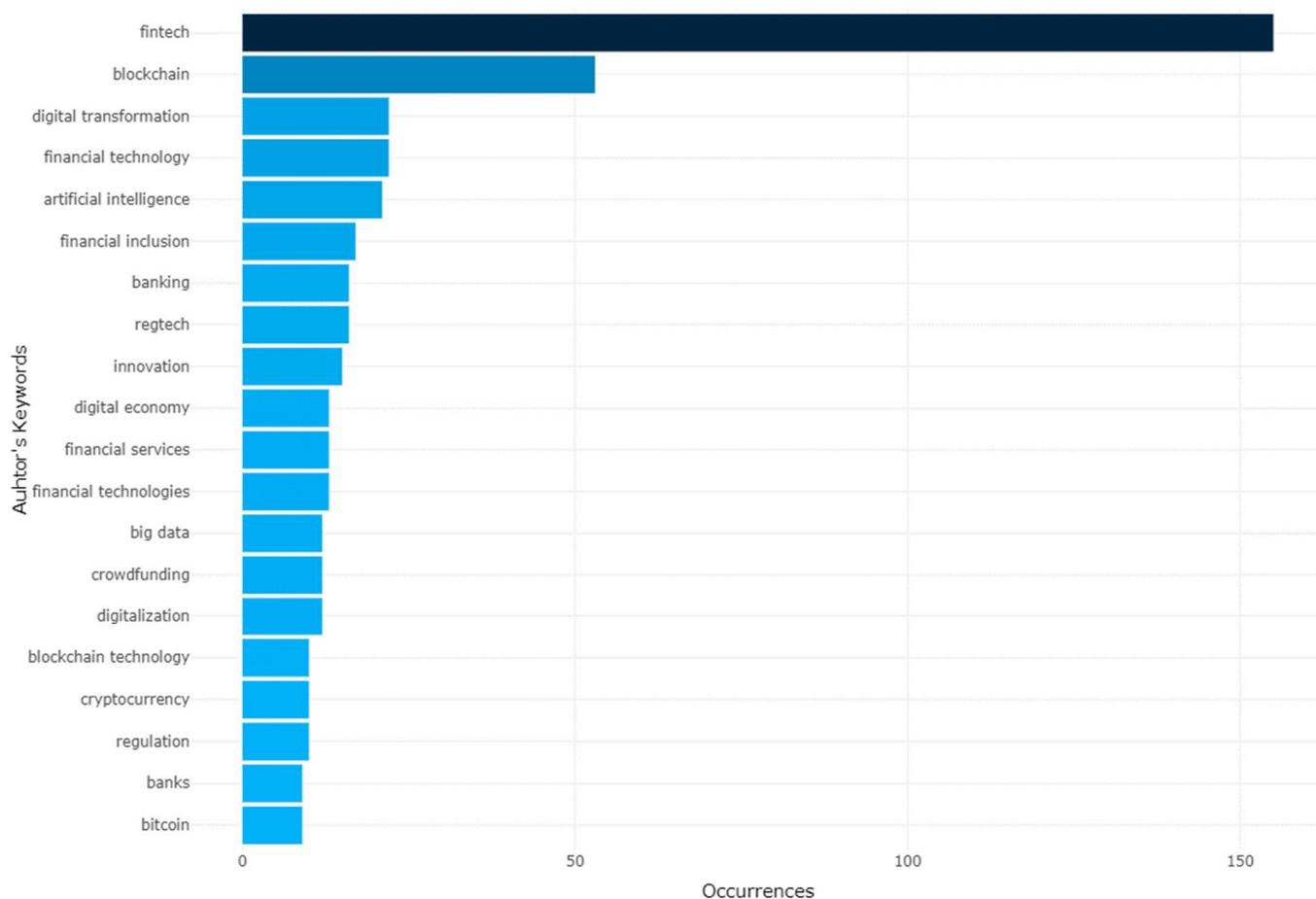


Figure 7. Most frequently used author keywords. Source: Scopus, elaborated in Biblioshiny.

VOSviewer’s map of the weighted occurrence of authors’ keywords is presented in Figure 8, which clusters the 50 most popular keywords used by the authors. The words “fintech”, “blockchain” and “digital transformation” are indicated as the most popular. The map’s color scheme allows the tracking of changes in the popularity of the words over time. Thus, such words as “financial services”, “disruption” and “big data” were popular before 2018, but since then, attention has shifted from “crowdfunding”, “blockchain” and “innovation” towards “digital economy”, “financial inclusion” and “artificial intelligence”. This tendency might reflect the shift in academia and industry interest towards the broader and more social-oriented impacts of Fintech on the economy and society.

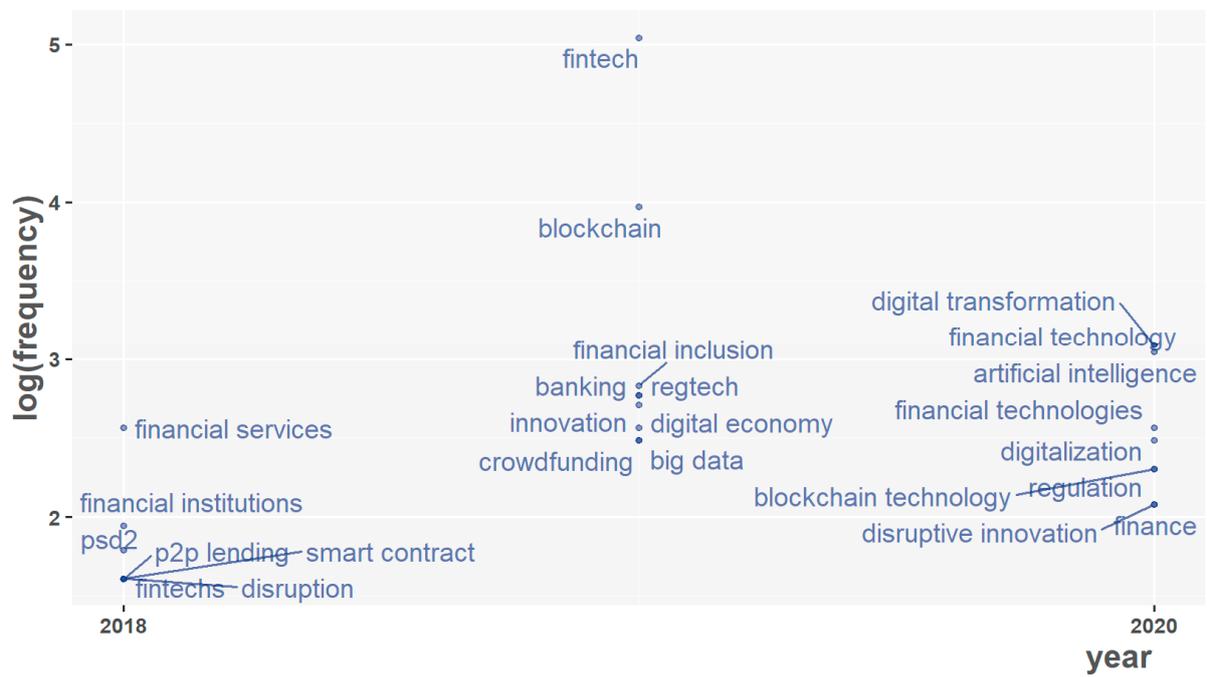


Figure 9. Trend topics. Source: Scopus, elaborated in Biblioshiny.

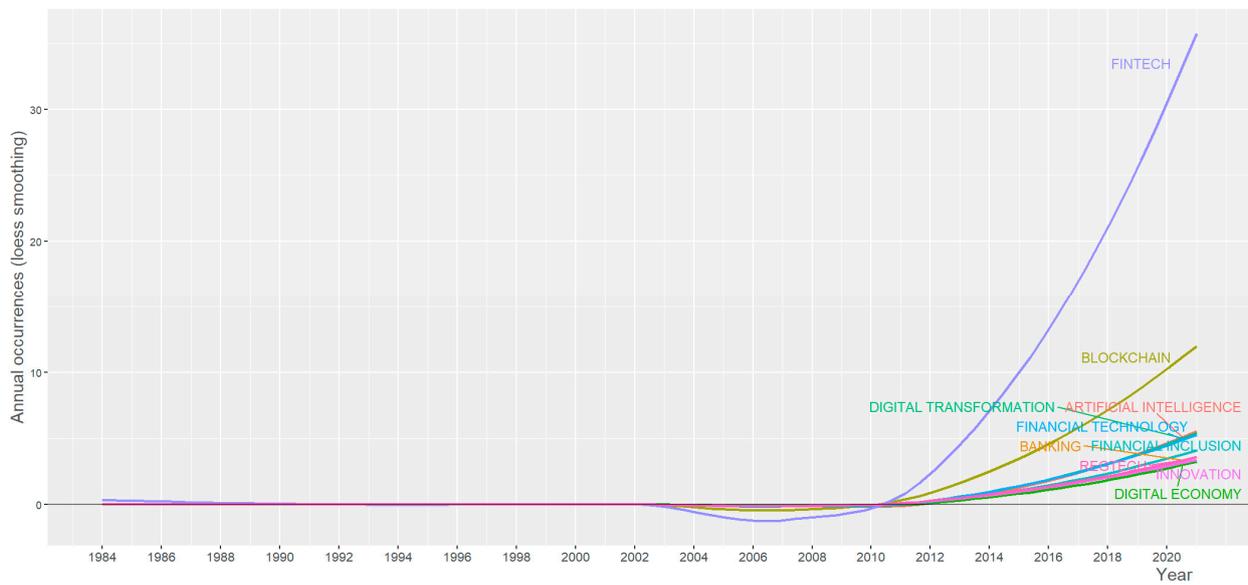


Figure 10. Word growth. Source: Scopus, elaborated in Biblioshiny.

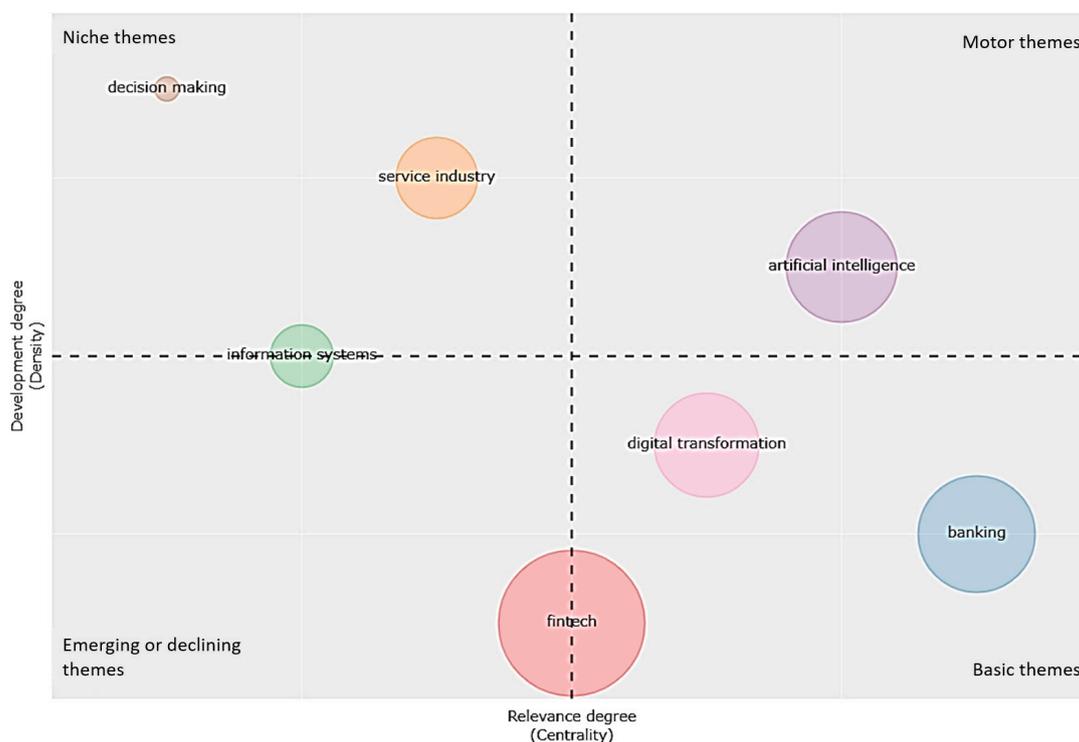


Figure 11. Thematic map. Source: Scopus, elaborated in Biblioshiny.

3.3. Analysis of Authors

3.3.1. The Most Productive and Most Cited Authors

This section discusses the results of the bibliometric analysis of authors who have published work on the defined topic. As demonstrated in Figure 12, the most productive authors are Gozman, D. and Lee Kuo Chuen, each with five publications on the defined topic. They are followed by Bataev, A.; Fenwick, M. and Na Na, with four publications each.

The most cited authors, Lee, I.; Shin, Y. and Kaufmann, R. J.; are presented in Table 3. As mentioned earlier, Lee and Shin’s paper “Fintech: Ecosystem, business models, investment decisions, and challenges” (Lee & Shin, 2018) [8] is the most cited document on the topic of Fintech as a financial disruptor.

Table 3. Twenty most globally cited authors.

Author	Documents	Citations	Total Link Strength
Lee, I.	1	128	67
Shin, Y.	1	128	67
Kauffman, R.J.	2	127	64
Gomber, P.	1	126	62
Parker, C.	1	126	62
Weber, B.W.	1	126	62
Eyal, I.	1	90	3
Tan, B.	3	74	48
Leong, C.	2	73	39
Tan, F.	2	73	39
Sun, Y.	1	71	36
Xiao, X.	1	71	36
Arner, D.W.	3	65	8
Buckley, R.P.	3	65	8
Bellenger, J.	1	64	0
Haroune I.	1	64	0
Legault, C.Y.	1	64	0
Ménard, A.	1	64	0
Salaun, M.	1	64	0
Marsal-Ilacuna M.	2	63	3

Source: Scopus, elaborated in Excel.

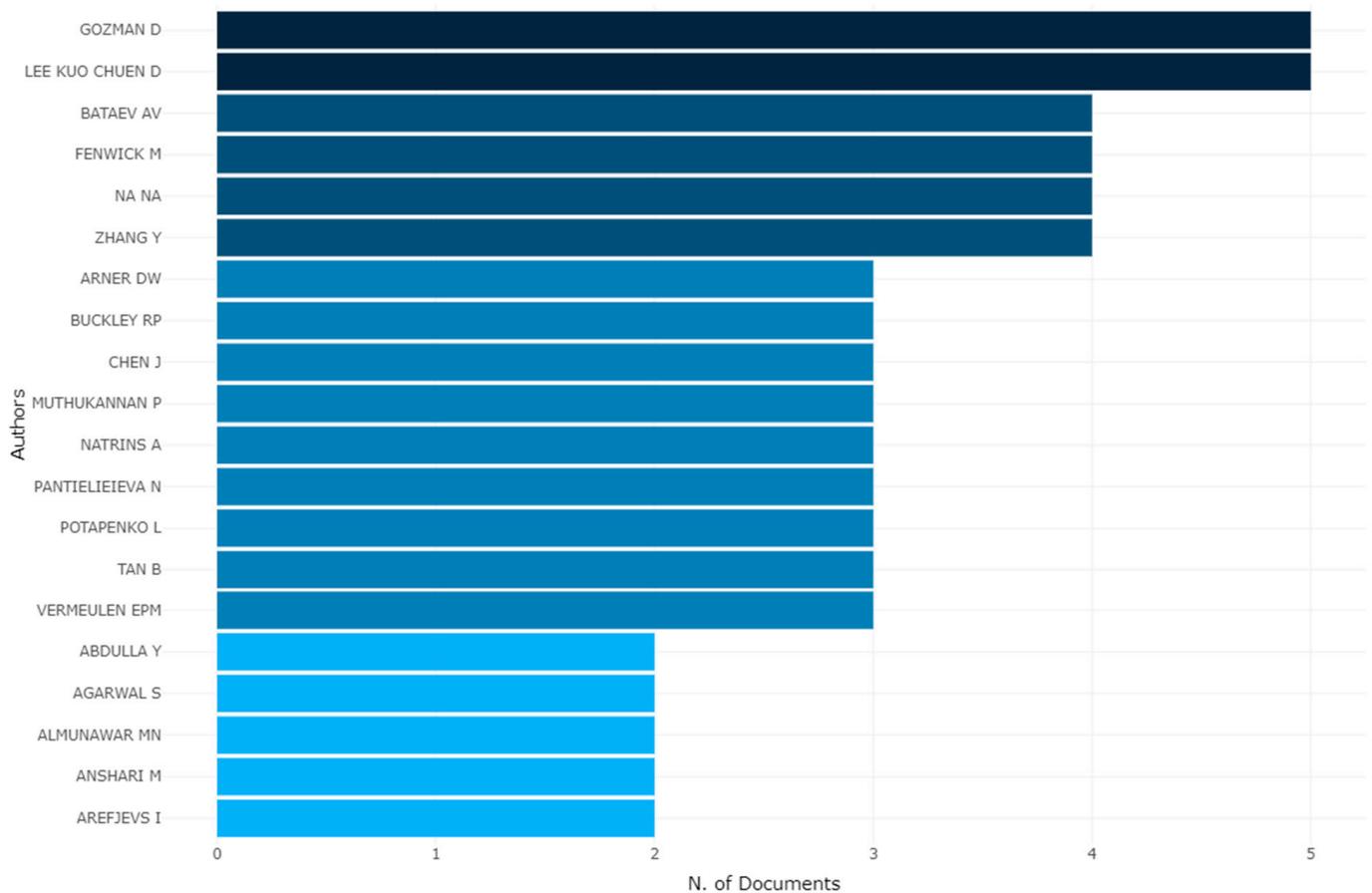


Figure 12. Most relevant authors. Source: Scopus, elaborated in Biblioshiny.

Figure 13 shows the VOSviewer graph with the most cited authors, the number of citations per author and the connections among these citations. The 29 most globally cited authors are presented as a network of 19 clusters with 1446 links. Lee Kuo Chuen, Gozman, D. and Zhang, Y. have the heaviest presence on this map, reflecting their high number of citations.

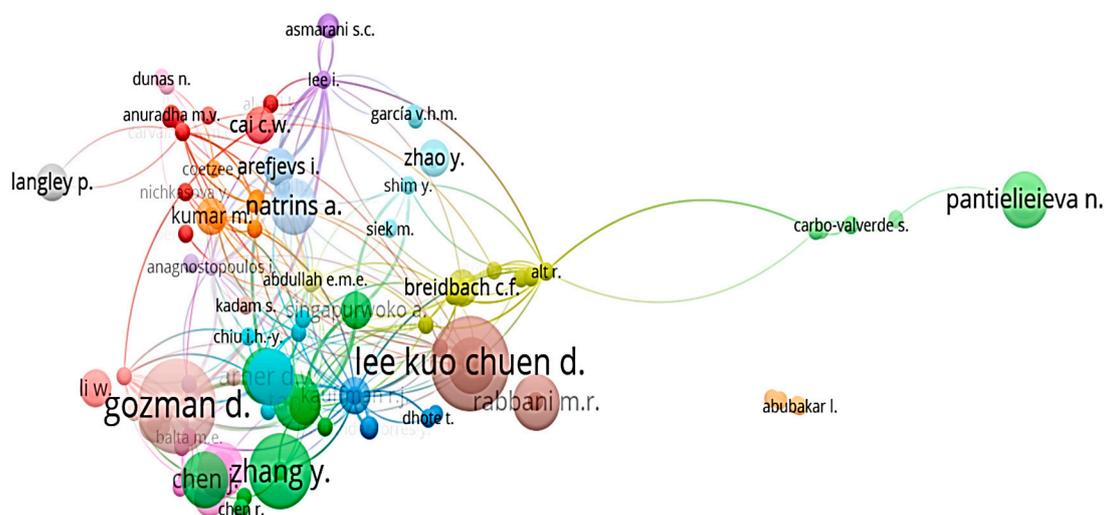


Figure 13. Most globally cited authors. Source: Scopus, elaborated in VOSviewer.

3.3.2. Authors' H-Index

Figure 14 presents the h-index as a measure of the authors' impact. The h-index combines the author's productivity with the impact of citations, thus offering a balanced measure of an author's overall influence. According to Figure 13, Lee Kuo Chuen, Arner, D. and Buckley, R. have the highest h-index of 3. It should be noted that the h-index in this analysis is restricted to the defined topic of Fintech as a financial disruptor, and does not represent an overall h-index of the authors mentioned in this study. As such, Google Scholar identifies Lee Kuo Chuen, D.'s overall h-index as 17, Arner, D.'s h-index as 26 and Buckley, R.'s as 23.



Figure 14. Author impact. Source: Scopus, elaborated in Biblioshiny.

Figure 15 demonstrates the activities of the authors with the most impact during the given timespan. The size of the bubble represents the number of publications in a given year, while the intensity of the color reflects the number of citations. However, larger bubbles with lighter colors and smaller bubbles with more intense colors suggest that a higher number of publications does not guarantee more citations. Gozman, D. and Muthukannan, P. have the most extended history of publishing on the given topic, having co-authored the earliest article in 1984, as defined by Scopus, while the other authors started publishing in 2017–2018.

Furthermore, 94.3% of all authors published only one document on the given topic (Table 4). Of all the authors, 1% published three documents, and only 0.2% of authors published five papers. This observation can be explained by the relative novelty of the topic of Fintech as a financial disruptor. The proportion of authors who have published more than one document on the given topic will likely increase in the future.

Table 4. Authors' productivity.

Documents Written	No. of Authors	Proportion of Authors
1	845	0.943
2	36	0.04
3	9	0.01
4	4	0.004
5	2	0.002

Source: Scopus, elaborated in Biblioshiny.

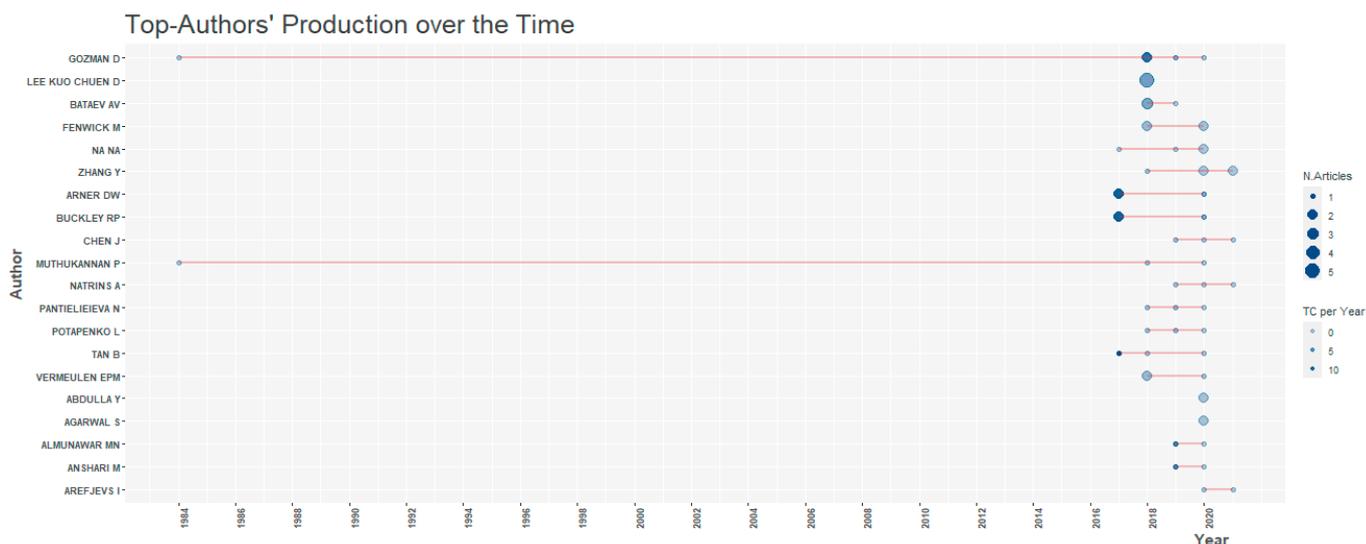


Figure 15. Top authors’ production over time. Source: Scopus, elaborated in Biblioshiny.

3.3.3. Co-Authorship of Authors

Figure 16 represents VOSviewer’s mapping of co-authorship. Thirty-seven co-authors were grouped into seven clusters, with Zhang, Y. having the most significant number of co-authorships. He has published four documents in co-authorship with 16 authors. Co-authorship in academia is growing, suggesting that the studied topics are becoming more interdisciplinary and thus require expertise from different fields.

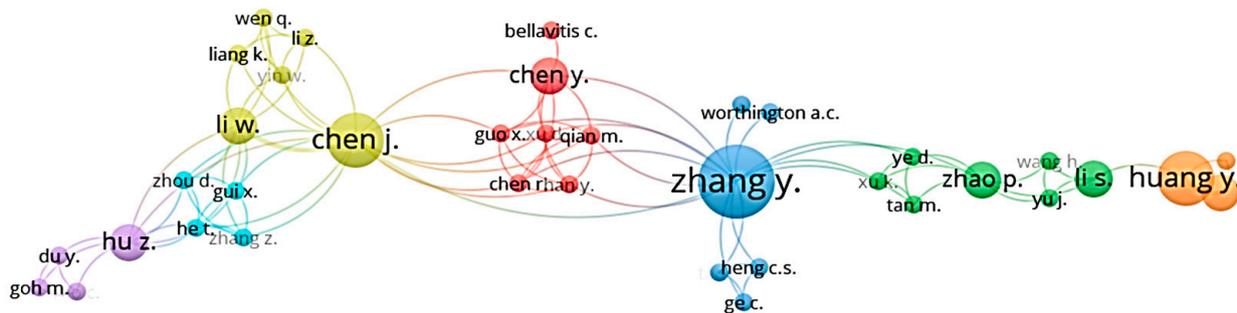


Figure 16. Co-authorships of the authors. Source: Scopus, elaborated in VOSviewer.

3.3.4. Authors’ Affiliations

The most productive authors were affiliated with the University of Indonesia (nine documents) and Amity University in India (eight documents) (Figure 17). The BA School of Business and Finance (Latvia), the National University of Singapore, Singapore University of Social Science, the University of Hong Kong and the University of Sydney follow, with six documents each. As can be observed from Figure 16, the productivity of authors associated with the topic of Fintech as a financial disruptor is higher in Asian universities.

3.3.5. Countries of Publications

According to Figure 18, the majority of authors who have published work on the topic are from the USA (19 documents), China (17 documents), the UK (13 documents) and India (9 documents). Multiple Countries Publication (MCP) indicates the number of articles per country in which at least one co-author is from a different country. Figure 17 demonstrates that authors from China established the highest number of international collaborations. Authors from Japan published all of their documents with an international team of authors. In contrast, researchers from Indonesia, Thailand, South Africa and Spain published papers written only in association with local authors.

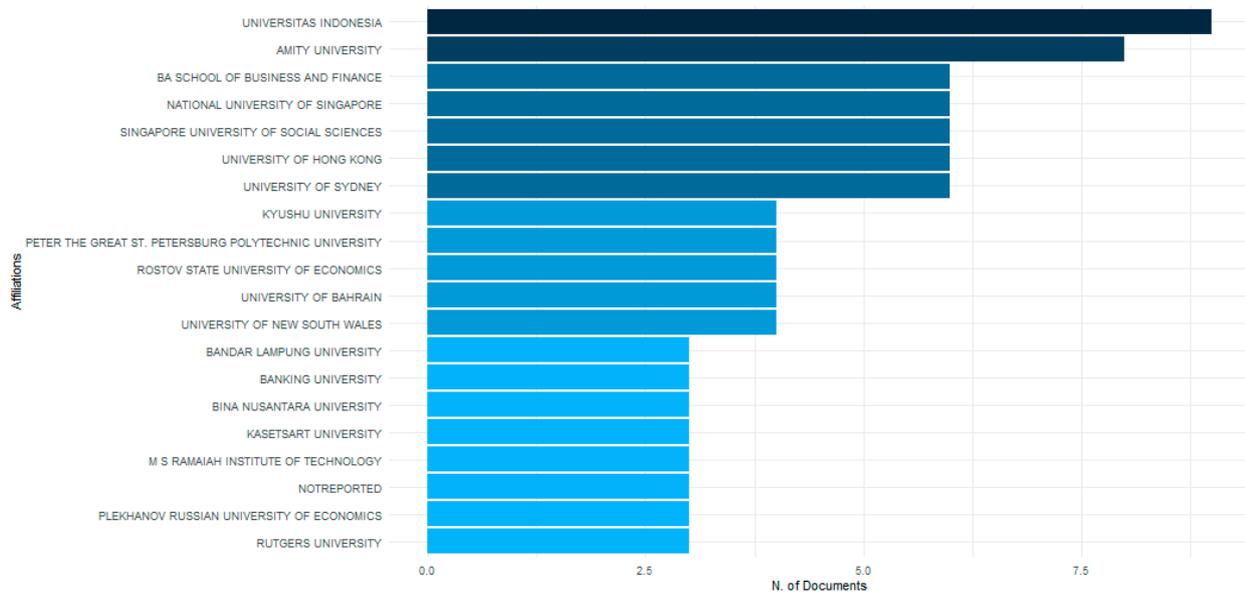


Figure 17. Most relevant affiliations. Source: Scopus, elaborated in Biblioshiny.

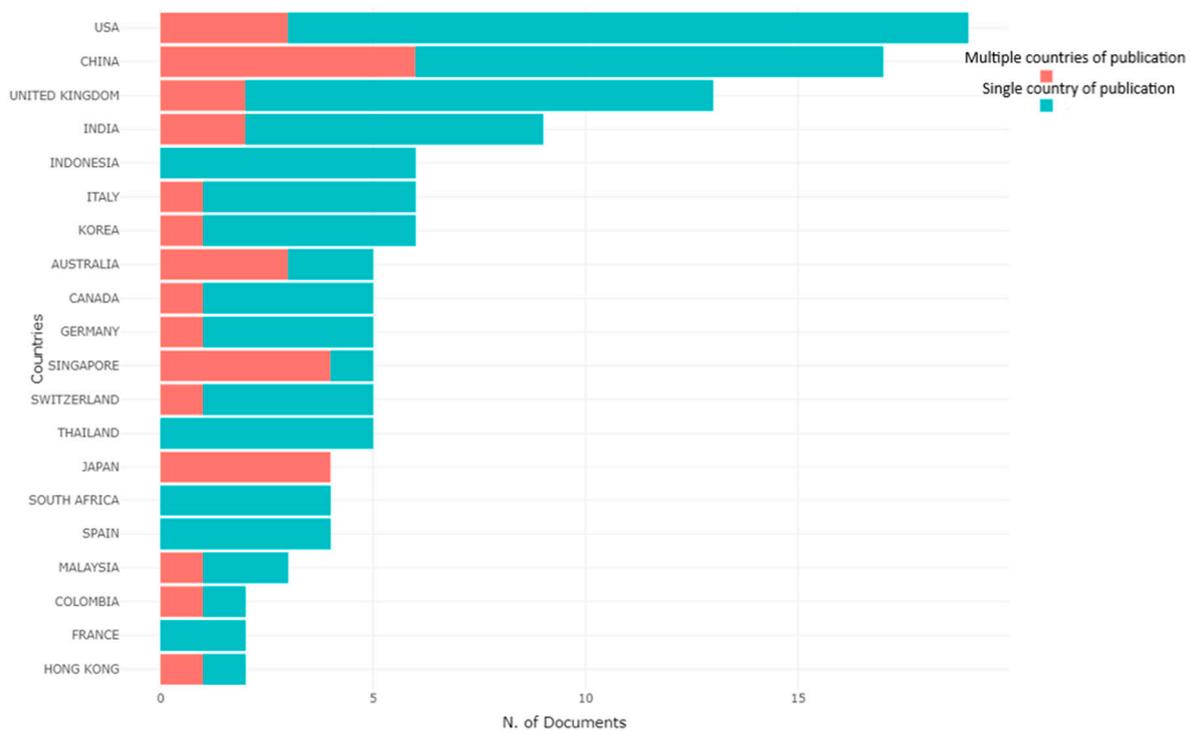


Figure 18. Corresponding authors' countries. Source: Scopus, elaborated in Biblioshiny.

Among the 73 countries represented by the authors, VOSviewer identified 51 countries with international co-authorships and grouped them into 11 clusters (Figure 19). It demonstrates that the USA, the UK and China have the highest number of collaborations among authors. The USA, for example, published 46 documents in co-authorship with 18 countries. China published 37 documents with ten countries, while the UK published 99 papers in co-authorship with 17 countries. The color scheme of the bubbles demonstrates that Australia, Germany and Switzerland were the leaders in collaboration among authors before 2018; the USA was the leader during 2018–2019. Since 2019, China, India and Russia have become the leaders in terms of collaboration among their authors.

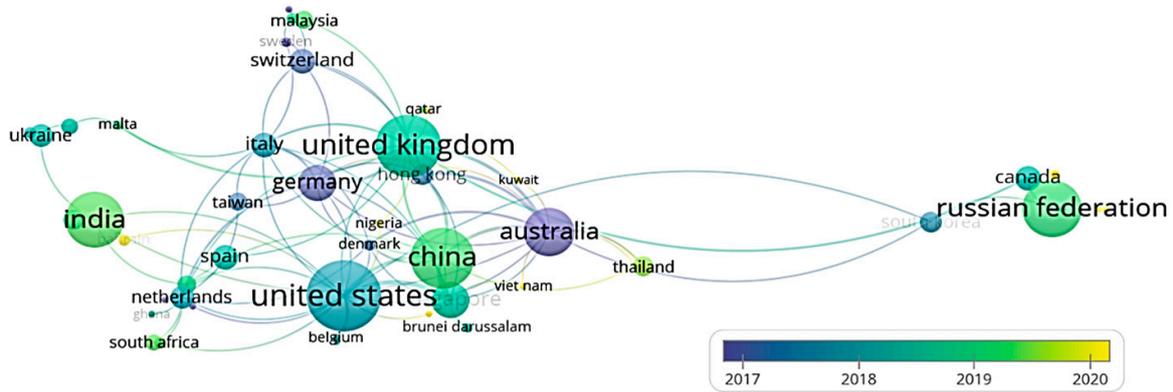


Figure 19. Co-authorships of countries. Source: Scopus, elaborated in VOSviewer.

3.3.6. Sankey Plot

The relationships among the top authors, the top keywords that they used and authors' affiliations are summarized by a Sankey plot in Figure 20. The three main metadata fields—keywords, authors and affiliations—have been chosen. The keywords define the research content, while the affiliations define the intellectual roots of the authors. The height of each rectangle represents the number of connections of each element with other elements. On the left side of the plot, the “Fintech” keyword has the highest number of connections with the authors, followed by “digital economy”, “financial services” and “regtech”. The authors with the most substantial connections with the main research topics are Pantelieieva and Potapenko from Banking University in Ukraine, followed by Lee Kuo Chuen from the Singapore University of Social Science.

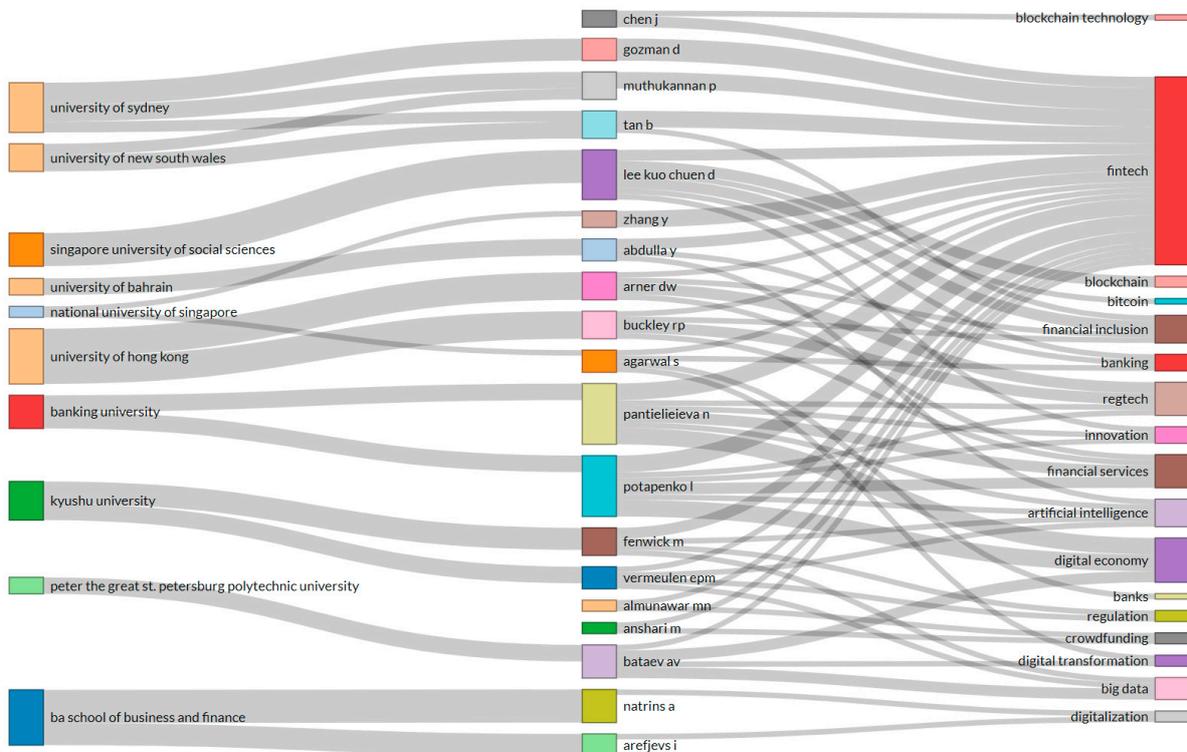


Figure 20. Three-fields plot (20 authors, keywords, affiliations). Source: Scopus, elaborated in Biblioshiny.

4. Discussion and Conclusions

We have conducted a bibliometric analysis on the topic of Fintech as a financial disruptor based on 363 documents identified in the Scopus database and published during the period from 1984 to February 2021. The key finding of the analysis is that the given topic of Fintech is relatively new, but with strong potential for further development. These observations, along with some additional findings, are discussed below.

First, the increasing number of publications during the last few years, especially in 2020, demonstrates the growing popularity of the Fintech topic. This popularity may be explained by the rapid advancement and penetration of Fintech solutions, which was accelerated during the COVID-19 pandemic. Publications in reputable journals such as the *Journal of Management Information Systems* and *Harvard Business Review* indicate the strong interest of academia. However, such interest is still nascent, resulting in a relatively low number of books published on the topic, especially when compared to the higher number of published articles and conference papers. One might expect more books and book chapters on the given topic to be published in the near future. The fact that the most productive sources of publications were identified as conference proceedings and lecture notes is another argument for the novelty of the topic.

Furthermore, the fact that the majority of publications are in the area of computer science reflects the dual nature of Fintech—an amalgamation of technology and finance. This observation is supported by the fact that the two most cited publications are in journals related to information systems. At the same time, the most cited document—authored by Lee and Shin (2018) [8]—was published in the *Business Horizons* journal, which covers articles in the field of business, confirming the abovementioned duality of the defined topic.

Analysis of the most frequently used words reveals that “Fintech”, “blockchain” and “digital transformation” are the most popular keywords. The relative popularity of the keyword “blockchain” might be explained by the association of authors studying financial disruption and the advancement of blockchain technology. Furthermore, Biblioshiny mapped the term “digital transformation” among the primary themes that require further research. Similarly, a shift in the trending topics towards “digital transformation” and “disruptive innovation”, as observed in VOSviewer, indicates the relatively recent interest of academia towards the topic.

The popularity of such terms as “blockchain technology” and “artificial intelligence” might reflect the further advancement of Fintech towards more specialized topics. At the same time, the emerging popularity of the term “financial inclusion” might demonstrate the interest of academia in such dimensions of Fintech in terms of social impact.

Furthermore, the bibliometric analysis revealed that Lee Kuo Chuen, Arner, D. and Buckley, R. are the authors with the highest impact, as measured by the h-index. The relatively high h-index of these authors can be explained by the fact that Lee Kuo Chuen is also the most productive author, while Arner and Buckley are among the top 10 authors with the highest number of publications. The fact that the vast majority of authors have published only one document on the given topic may reflect the nascent phase of the topic; more publications can be expected from these authors.

The fact that the most productive authors are affiliated with relatively unknown universities can be explained by the fact that “most productive” does not necessarily mean “the most cited”, as the analysis demonstrates that a higher number of publications does not guarantee more citations. The novelty of the topic might also affect the list of the most productive authors’ affiliations. As interest increases in the Fintech topic, this might lead to more published documents from leading institutions.

Most of the articles were published by several co-authors, including all of the most cited articles. Furthermore, many articles were the result of international collaboration. For example, the paper by Lee and Shin (2018) [8] was produced in collaboration with authors from Western Illinois University, USA and Hankyong National University, South Korea. The paper by Gomber et al. (2018) [9] was written by four authors from universities in

Germany, Singapore and the USA. China had the largest number of articles on the given topic produced by teams of international authors.

A limitation of this study is that the analysis was based on a relatively limited number of publications, which is a potential shortcoming that may be attributed to the nascent stage of the subject. This limitation may potentially affect the results of the bibliometric analysis compared to the potential results had it been conducted on a larger sample size. It is also possible that there were publications in languages besides English that were not taken into account.

The advancement of Fintech and its increasing impact on the financial system are expected to generate further academic interest and publications on the topic. Therefore, a similar analysis may be conducted at a later date, which could include a greater number of observations with which to compare the validity of the results presented in this paper, as well as presenting new trends and tendencies.

The results of the analysis described in this paper represent an overview of the topic of Fintech as a financial disruptor. With this paper, the objective and hope of the authors is to generate further interest and catalyze more in-depth research on the topic. The social and economic impacts of the financial disruption caused by Fintech are particularly promising areas for future study.

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