

Visualization and Bibliometric Analysis of FinTech Trend Research

Ahsanul Haq*, Muhammad Bahit
Computerized Accounting Study Program
Politeknik Negeri Banjarmasin
Banjarmasin, Indonesia

*ahsanul@akuntansipoliban.ac.id, bahit@poliban.ac.id

Abstract—Nowadays, technology in the field of economy and funding is continuously increasing. Almost every activity can be done at your fingertip by gadgets, such as checking deposit rates, transacting online, transferring with mobile banking applications, and so on. Financial Technology, or widely known as FinTech, is massively popular among the media and for those who are active in the technology field. With the development of FinTech, there have been various studies conducted in this area. Thus, this study aims to present the latest trends from FinTech studies. This study succeeded in obtaining thirty papers published in Elsevier, IEEE, Scopus, Papers.ssrn, Springer, Taylor & Francis, and Wiley Online Library from 2015 to 2020 and classified based on the topics analyzed, namely FinTech trends research. In addition, this research employed Mendeley's software for managing and resuming references, VOSviewer for data visualization, and Harzing's Publish or Perish for metrics and citation analysis.

Keywords—Bibliometric analysis and FinTech

I. INTRODUCTION

The digitalization of financial services has changed traditional financial business processes into a technology-based business process [1]. Numerous innovations in loan and savings services, peer-to-peer (P2P) lending, and the use of social media, investment, financial markets, trading, risk management are carried out using digital technology, known as FinTech (Financial Technology) [2]. FinTech is technology and innovation that offers better services and technology in the financial services industry in the technological era of the industrial revolution [3]. FinTech has been growing rapidly in various sectors, such as payment gateways, wealth management, crowd-funding, lending, and others.

The application of FinTech technology innovation has the potential to increase sustainable economic growth and become a breakthrough to expand financial services to hundreds of millions of people [4]. FinTech companies can collect and process information resources more quickly to produce information [5]. In addition, FinTech can also facilitate access to financial services, encouraging competition with new players to enhance new strategies [6].

There are three main factors contributing to the emergence and development of FinTech [7]. The first factor is the advent of new technologies, such as big data, distributed ledger technology, cloud computing, artificial intelligence, and machine learning [8]. The second factor is the decline in consumer, business, and government confidence in large banking institutions after the 2008 financial crisis [9]. Meanwhile, the third factor is related to the adoption of new technology by consumers, particularly the new generation of digital natives [10].

FinTech Therefore, it is evident that effective financial regulation is highly crucial for the innovation and success of the financial services industry in the future [11]. As a matter of fact, many innovations have been introduced by FinTech developers in line with current technological developments [3].

The research aims to study: (1) what is the trend of FinTech research and (2) what are future FinTech topics that provide opportunities for further research?. This research was conducted by adopting a bibliometric analysis based on data obtained from the Scopus Elsevier database, IEEE, Scopus, Papers.ssrn, Springer, Taylor & Francis, and the Wiley Online Library from 2015 to 2020. The results of the bibliometric analysis can explain the phenomena of FinTech trend research and future FinTech topics that provide opportunities for further researches.

II. METHODOLOGY

The method employed in this study adopted the bibliometric analysis method carried out by Fahimnia et al [12]. A bibliometric method is a field of science that aims to classify and interpret statistics related to books and publications [7]. Apart from that, bibliometric methods are also applied to measure certain research topics that can be applied to envisage the development of new technologies [13]. The steps taken in analyzing the bibliometric method applied in this study were (1.) defining the search keyword, namely 'FinTech', (2.) discovering initial search results, (3.) narrowing the search results, (4.) composing preliminary data statistics, and (5.) analyzing data. The explanation of each bibliometric method is as follows:

A. Defining Search

Literature searching was conducted through Google Scholar database with the keyword 'FinTech' trend research published from 2015 to 2020. Google Scholar database was selected to access all articles related to 'FinTech' since the Google Scholar database is the most commonly accessed index.

B. Initial Search Results

Publish or Perish (PoP) was employed to collect articles from the Google Scholar database with the keyword 'FinTech' trend research. In addition, the maximum number of results was 1,000. Afterward, this study also eliminated articles of which the publication locations were not detected. This study also omitted non-English articles. Moreover, this research did not use articles that were not from proceedings or journals, such as books, magazines, and others. In other words, this study only analyzed articles completed with citations.

C. Refinement of the Search Results

After the initial search results were met, this study only analyzed articles published in journals and proceedings published in Elsevier, IEEE, Sagapub, Papers.ssrn, Springer, Taylor & Francis, and the Wiley Online Library. The choice of this journal publication site was to maintain the articles' quality from the published publications. In addition, this study also eliminated articles that did not contain the "FinTech" title. Furthermore, it also excluded articles that were not related to FinTech trend research. The purpose of this step was to ensure the congruence of the article analyzed with the theme decided by the researchers, namely 'FinTech' trend research.

D. Compiling the Initial Data Statistics

The searching results after the revision was downloaded and saved in the Mendeley software. All necessary information related to the paper, including title, author's name, abstract, keywords, and journal specifications (journal publication, year of publication, volume, issue, and pages) was re-checked to verify that the articles analyzed were complete. Then, the articles that had been cross-checked were exported to RIS and CSV formats for analysis based on the classification of journal publication and publication trend over year.

E. Data Analysis

This study presented a bibliometric analysis using the Publish or Perish (PoP) software version 7.25.2877.7516. The PoP software was developed by Tarma Research Software Pty Ltd-Melbourne [14]. Furthermore, the articles engaged in this research were the results of the PoP search, fulfilling the requirements determined by the researchers. Afterward, the articles were exported in the form of RIS. Then, the files were imported into the Mendelay software for a cross and check test, including title, abstract, keywords, place of publication, year, and author. It was performed to ensure that the articles to be analyzed were complete before importing them into the VOSViewer software. The VosViewer software, in addition, was employed to visualize bibliographies or data sets

containing bibliographic fields (title, author, author, and journal).

III. RESULTS AND DISCUSSION

A. Initial Search Results

The initial search results carried out on September 20, 2020, through the Google Scholar database produced 996 articles. There were 288 articles of which the publication sites were undetected and 20 articles that were not published in English. On the other hand, articles that were not generated from proceedings or journals, such as books, magazines, and others, were the most eliminated articles, reaching 351 articles. It is reasonable since Google Scholar indexed articles related to the search words. In addition, this study also excluded 149 articles without citations. For further information, Table 1 of Initial Search Screening Criteria describes the initial search results.

TABLE I. DETAILED INITIAL SEARCH SCREENING CRITERIA

Search Screening	Number of Articles
No article publication	288
Not in English (Indonesian, Arabic, and Chinese)	20
Not identified (journal / proceeding)	351
Articles without citation	149
Initial search screening criteria	188
Total	996

B. Refinement of the Search Results

Of the 118 articles from journals and proceedings, only 39 articles were published in publication sites that had been determined by the researchers. Moreover, the 75 articles were not from Elsevier, IEEE, Sagapub, Papers.ssrn, Springer, Taylor & Francis, and the Wiley Online Library. Furthermore, there were 23 articles that did not state the "FinTech" title and 51 articles which are not relevant with FinTech trend research (table 2).

TABLE II. DETAILED REFINEMENT OF THE SEARCH SCREENING CRITERIA

Refinement of the Search Results	Number of Articles
No articles from (Elsevier, IEEE, Sagapub, Papers.ssrn, Springer, Taylor & Francis, dan Wiley Online Library)	75
Without FinTech titles	23
Not relevant with FinTech trend research	51
Initial refinement of the search results	39
Total	188

C. Data Statistics

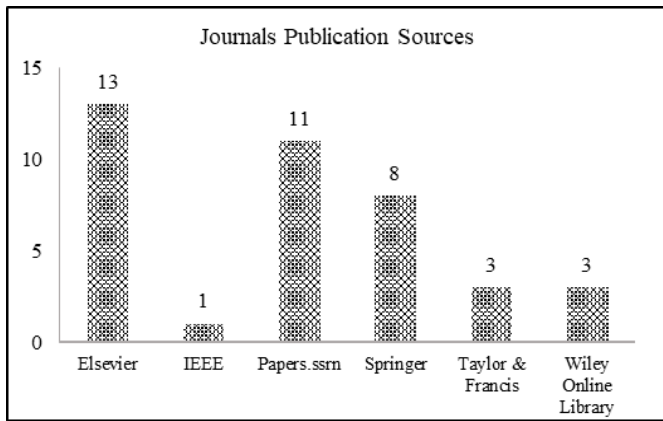


Fig. 1. Journals publication sources.

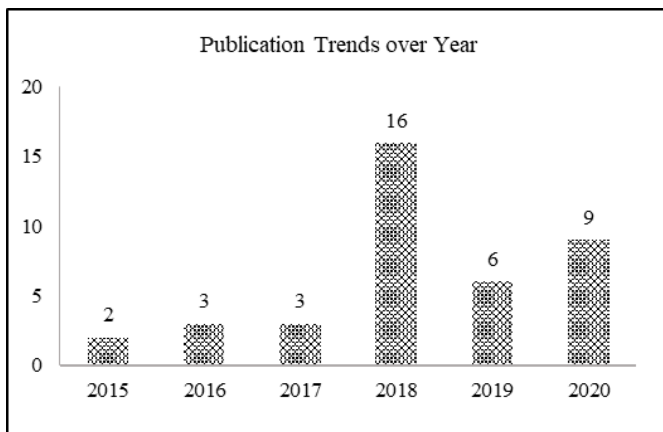


Fig. 2. Publication trends over year.

D. Data Analysis Result

The bibliometric analysis from POP software, which was run on September 20, 2020, resulted in 996 articles with CitesPaper rate of 7.48. The refinement of the results generated 188 articles with Cites/Paper rate of 21.66. There were 39 articles related to the FinTech theme, published by Elsevier,

IEEE, Sagapub, Papers.ssrn, Springer, Taylor & Francis, and the Wiley Online Library with Cites Paper rate of 54.41. The analysis result identified that journals from Elsevier, IEEE, Sagapub, Papers.ssrn, Springer, Taylor & Francis, and the Wiley Online Library have the most significant influence on citations compared to other journals. The complete results of the metrics comparison before and after the search refinement are summarized in Table 3, as follows.

TABLE III. METRICS COMPARISON

Source	Defining Search Keywords	Initial Search Results	Refinement of the Search Results
Papers	996	188	39
Citations	7432	4073	2122
Cites/Year	218.59	814.6	424.40
Cites/Paper	7.48	21.66	54.41
Author/Paper	2.00	2.35	2.36
h-index	38	31	20
g-index	80	60	39
hI-norm	28	22	17
hI-annual	0.82	4.40	3.40

E. VosViewer Analysis

VOSviewer analysis was conducted based on articles' titles and abstracts. The relationship with terms of VOSviewer was set to 5 terms. Meanwhile, 60 of 1,102 terms were analyzed using VOSviewer. There were 6 clusters, each cluster had a different number of keywords, namely the red cluster of 14 terms, the green cluster of 12 terms, the blue cluster of 11 terms, the yellow cluster of 10 terms, and the purple cluster of 8, while the blue cluster of 5 terms. (Figure 3. Visualization Topic Area Using VOSviewer with Network Visualization). From figure 3, it can be concluded that the most-frequently-appeared keyword, 'FinTech', was closely related to the keywords of 'Bank', 'Innovation,' and 'Research'. It indicates that research in the field of FinTech is always related to banking and technology innovation activities. These activities were implemented as FinTech technology, which are closely related to the financial system. Thus, it is expected for future researchers who raise FinTech as their research topic to pay attention to these keywords.

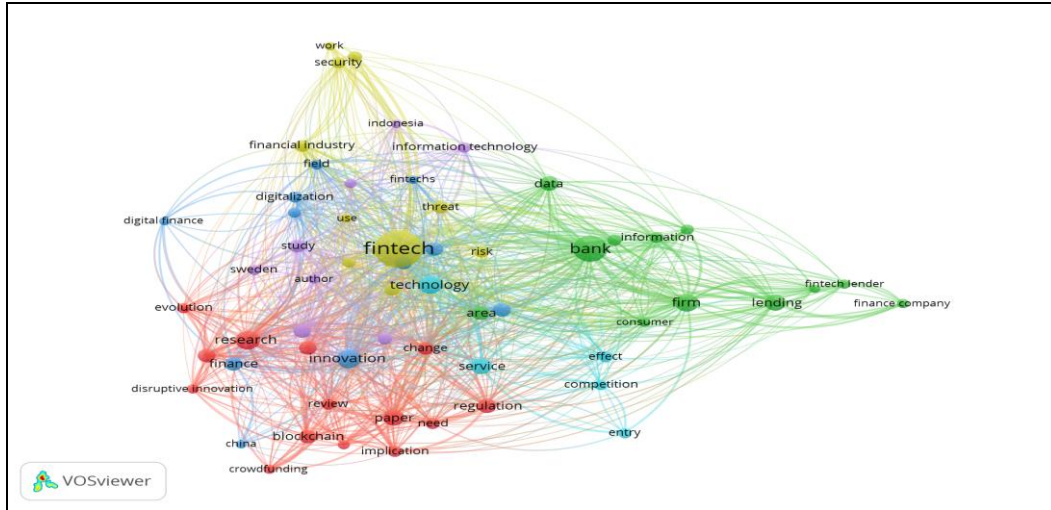


Fig. 3. Visualization topic area using VOSviewer with network visualization.

After considering the most frequently appeared keywords, this study also mapped the year on which the “FinTech” keyword occurs frequently (Figure 4. Visualization Topic Area Using VOSviewer with Overlay Visualization). This figure illustrates that the ‘FinTech’ keyword mostly appeared and

was correlated with other studies in 2018. It is understandable since among the 39 articles studied, most of them were published in 2018. As a result, it influenced the keyword frequency.

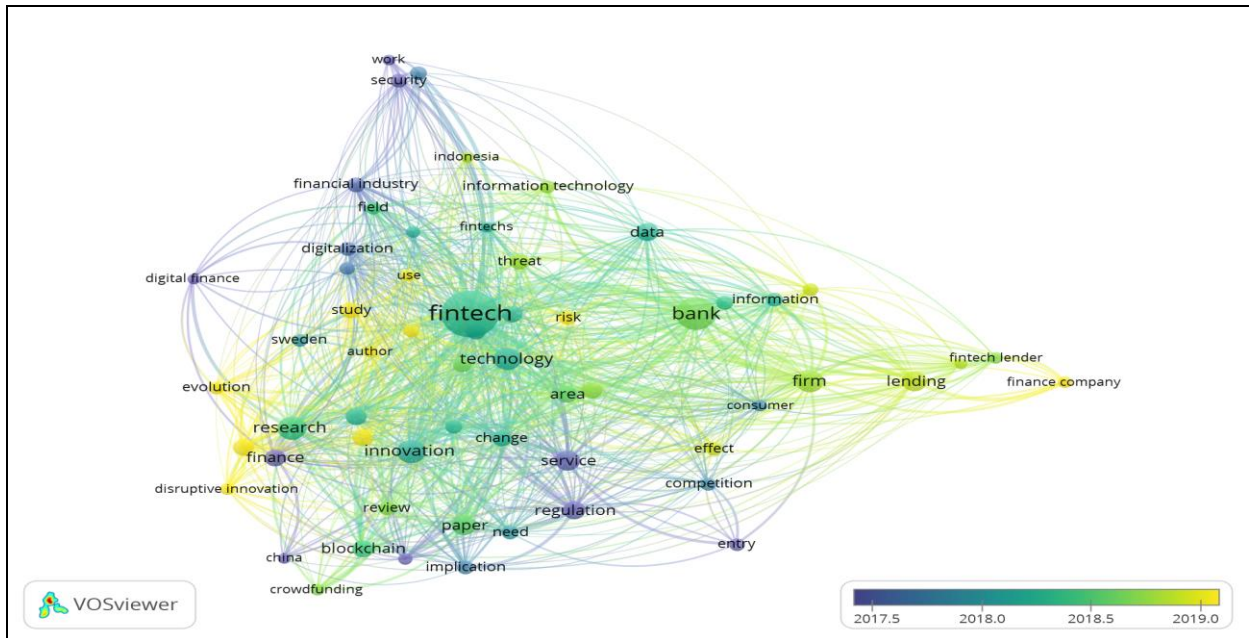


Fig. 4. Visualization topic area using VOSviewer with overlay visualization.

Apart from analyzing the keyword frequency and year frequency, this study also analyzed the rank of keywords that often appeared, namely 'FinTech', followed by 'Bank'. It identifies that FinTech and Banks are always closely related to

payment systems. Therefore, researches related to FinTech should take into account the payment system regulations in banks when implementing FinTech (Figure 5. Visualization Topic Area Using VOSviewer with Density Visualization).

