

Islamic Fintech During Covid-19 Outbreak: A Bibliometric Review

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Islam regulates everything perfectly, even the smallest things are regulated in This study aims to determine the map of research developments on the theme of Islamic financial technology (fintech) in the momentum of the Covid-19 pandemic published by various indexed journals. The research was conducted in September 2020. The data analyzed were 50 research publications. The object of study is published journals published in 2020. The data was then processed and analyzed using the VOSviewer application program to determine the bibliometric mapping of the development of Islamic financial technology research in the momentum of the Covid-19 pandemic. The results show that the number of publications on this theme has increased significantly. Bibliometric visualization shows that the research development map is divided into 4 clusters. Cluster 1 consists of 12 topics, cluster 2 consists of 12 topics, cluster 3 consists of 11 topics, and cluster 4 consists of 3 topics. The finding of this research is that there is special attention to the development of financial technology as an alternative financial system in dealing with the economic impact caused by the Covid-19 pandemic.

Keywords: Islamic Fintech; Covid-19; Bibliometric

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1.1.

INTRODUCTION

The whole world is currently experiencing a long crisis due to the Covid-19 pandemic since early 2020. One of the consequences is that it is difficult to establish economic transactions between individual communities and others directly, so there is a need for innovation in the economic and financial fields that can answer this problem so that distance is no longer a barrier and economic turnover can still take place by adjusting to existing technological developments, one of which is through various product innovations in the field of financial technology (fintech). (Seetharaman, 2020). With this fintech, economic transactions can still be carried out between individuals, even those who are separated from one country to another.

The rapid development of technology in recent years has certainly become an opportunity to be applied in various fields, one of which is the economic and financial sector. The existence of financial technology is projected to be an attractive technology that will allow companies to compete effectively in the future. (Gün, 2020). In general, what is meant by fintech is technology-based innovation to generate new business models, applications, processes or products related to material effects on financial markets and institutions and the provision of financial services.

Fintech itself has been classified in several periods of development. Starting from fintech 1.0 which was the beginning of the link between financial services and technology that began in late 1966, then fintech 2.0 which began to build a stronger foundation to develop its form in early 2000. Until now, fintech has entered the third stage of development, namely fintech 3.0, which begins with various new technology pioneers that are more suitable, especially in a momentum where everything can be done remotely and more easily, of course fintech can improve financial service traffic operations in various business industries. (Baber, 2020).

Through fintech, financial systems in various countries around the world are starting to transform into digital. Of course, in addition to bringing great opportunities, fintech can also create new risks that may have never happened before. (Arner et al., 2020). Fintech is a combination of solutive business models, especially in the momentum of the Covid-19 pandemic, although the fintech ecosystem is quite complex, covering a variety of techniques from data security to financial service delivery, its development has been quite extraordinary in recent years. (Md Husin et al., 2020).

There are 50 scientific research papers published by various national and international journals within the observation period of early 2020 until the time of writing this paper, September 2020, which discuss financial technology in the momentum of the Covid-19 pandemic. Papers with this theme are interesting to discuss considering the importance of scientific research to continue to be carried out in order to generate ideas and innovations that can answer the country's economic problems in the future.

This study is organized as follows. The second section provides an overview of the research method, namely the bibliometric method. The third section presents and reports the results of descriptive research while providing content analysis of each cluster category in the meta-analysis consisting of the number of publications of papers on the theme of financial technology in the momentum of the Covid-19 pandemic, methodological approaches used, research topics, top authors, top institutions and countries as top study objects. The fourth section will explain the visualization of bibliometric mapping ranging from keyword trends, authors to journals that publish financial technology theme papers in the momentum of the Covid-19 pandemic. The fifth section is the closing of the paper which contains a summary of the main discussion and conclusions.

RESEARCH METHODS

Bibliometric mapping is an important research topic in the field of bibliometrics (Borner et al. 2003). Two distinguishable aspects of bibliometrics are the construction of the bibliometric map and the graphical representation of the map. In the bibliometric literature, most attention has been paid to the construction of bibliometric maps. Research on the effects of differences in similarity measures (Ahlgren et al. 2003, Klavans and Boyack 2006a, Van Eck and Waltman 2009), and they test with different mapping techniques (Boyack et al. 2005, Van Eck and Waltman 2007b, White 2003). The graphical representation of bibliometric maps has received less attention. Although some researchers have seriously studied issues related to graphical representations (Chen 2003, 2006, Skupin 2004), most articles published in the bibliometric literature rely on simple graphical representations provided by computer programs such as SPSS and Pajek.

For small maps containing no more than, say, 100 items, a simple graphical representation usually produces satisfactory results. However, there seems to

be a trend towards larger maps (e.g., Boyack et al. 2005; Klavans and Boyack 2006b; Leydesdorff 2004; Van Eck et al. 2006, in print), and for such maps a simple graphical representation is inadequate. Graphical representations of large bibliometric maps can be further enhanced with, for example, zoom functions, special labeling algorithms, and density metaphors. This kind of functionality is not incorporated into the computer programs commonly used by bibliometric researchers. In this paper, we introduce a new computer program for bibliometric mapping. The program pays special attention to the graphical representation of bibliometric maps.

This section discusses the use of VOS, which is to construct bibliometric maps. The goal of VOS is to place items in a low dimension such that the distance between two items accurately reflects the uniformity or relatedness of the items. For each pair of items i and j , VOS requires an input similarity s_{ij} ($s_{ij} \geq 0$). VOS treats the similarity s_{ij} as a measurement on a ratio scale. Similarity s_{ij} is usually calculated using the strength of association defined in Equation 1 (e.g. Van Eck & Waltman, 2007b; Van Eck et al., 2006). VOS determines the location of items in the map by minimizing the

$$V(x_i, \dots, x_n) = \sum_{i < j} s_{ij} \|x_i - x_j\|^2 \quad (1)$$

become:

$$\frac{2}{n(n-1)} \sum_{i < j} \|x_i - x_j\| = 1 \quad (2)$$

Therefore, the idea of VOS is to minimize the weighted sum of the squared distances between all pairs of items. The squared distance between pairs of items is weighted by the similarity between the items. To avoid worthless solutions, where all items have the same location, a constraint is imposed that the average distance between two items should be equal to one.

There are two computer programs that have implemented the VOS mapping technique. Both are freely available. A simple open source program is available at www.neesjanvaneck.nl/vos/, and a more advanced program called VOSviewer (Van Eck & Waltman, 2010) is available at www.vosviewer.com. Both programs use a variant of the SMACOF algorithm mentioned above to minimize Equation 1 to Equation 2.

This study uses paper publication data sourced from various journals with research on the theme of

financial technology in the momentum of the Covid-19 pandemic. Data collection through paper searches within the last year. From the search results, 50 publication articles were obtained. Data in the form of the number of paper publications on the theme of financial technology in the momentum of the Covid-19 pandemic, methodological approaches, research topics, top authors, top institutions that contributed to publishing publication articles were analyzed using Microsoft Excel 2010. Meanwhile, the development trend of financial technology theme publications in the momentum of the Covid-19 pandemic was analyzed using VOSViewer software.

The computer program introduced is called VOSviewer. VOSviewer is a program developed to build and view bibliometric maps. The program is freely available to the bibliometric research community (see www.vosviewer.com). VOSviewer can for example be used to create author or journal maps based on *cocitation data* or to build keyword maps based on co-occurrence data. The program offers a viewer that allows bibliometric maps to be examined and elaborated in detail.

VOSviewer can display maps in various ways, each emphasizing a different aspect of the map. It has functions for zooming, scrolling, and searching, which facilitate detailed examination of the map. The display capabilities of VOSviewer are particularly useful for maps that contain at least a large number of items (e.g., at least 100 items). Most computer programs used for bibliometric mapping do not display such maps in a satisfactory manner.

To build the maps, VOSviewer uses the VOS mapping technique (Van Eck and Waltman 2007a), where VOS stands for visualization of similarity. For previous studies where the VOS mapping technique was used, refer to Van Eck and Waltman (2007b) and Van Eck et al. (in press). VOSviewer can display maps constructed using appropriate mapping techniques. Therefore, the program can be used not only to display maps constructed using VOS mapping techniques but also to display maps constructed using techniques such as multidimensional scaling. VOSviewer runs on a large number of hardware and operating system platforms and can be started directly from the internet. Some studies with bibliometrics for example can be seen in Puspita (2023), Putri (2023), Maulida & Rusydiana (2022), Muttaqi (2023) and also Herindar & Shikur (2023).

RESULT AND DISCUSSION

This section describes the number of paper publications on the theme of the relationship between Islamic financial technology in the momentum of the Covid-19 pandemic. There are 50 papers published within the observation period of the last year. The distribution of a large number of papers dominates the theme in economic journals. The publication of Islamic financial technology theme papers in the momentum of the Covid-19 pandemic until September 2020 that we used as the object of study totaled 52 papers. However, because 2020 has not been completed until the December period, the number of papers is still possible

to increase and increase, the collection of paper data studied in this study is until September 2020.

Research Topic

Table 1 below shows some specific topics in the research papers on the theme of financial technology in the momentum of the Covid-19 pandemic. Based on this table, it can be seen that the top 3 research topics used in this theme paper over the past year are research topics related to 'investment' with 43 papers, then 'crowdfunding' with 22 papers and 'Peer to Peer Lending' with 18 papers. Each paper can contain more than one topic, so there are more than the number of papers used as research objects.

Table 1. Research Topic

Topic	Total
Investment	43
Crowdfunding	22
Peer to Peer Lending	18
E-Wallet	13
Payment Gateway	7
Market Aggregator	0

The topic with the lowest number of discussions is 'market aggregator' with 0 papers, or there is no research this year that discusses this topic, so it needs to be taken into consideration for researchers to then reproduce quality research related to this topic. The unavailability of relatively complete and comprehensive data is likely the reason why research related to the above topic is not widely published in the financial technology theme papers in the momentum of the Covid-19 pandemic.

Type of Research Approach

According to Punch (2013), there are 3 types of research approaches: qualitative approach, quantitative approach and *mixed* method approach. Table 2 below shows the research methodology used by each published paper on the theme of financial technology in the momentum of the Covid-19 pandemic. In this observation, the most used research approach is the qualitative approach, namely 34 papers, followed by a quantitative approach of 12 papers and a mixed approach of 4 papers.

Table 2. Methodological Approach Paper

Methodological Approach	Total
Qualitative	34
Quantitative	12
Mixed	4
Total	50

The research findings show that the number of empirical research on the theme of financial technology in the momentum of the Covid-19 pandemic is less than conceptual or mixed research. The research model that is widely used in qualitative methods is descriptive. The empirical research model that is widely used is multiple regression modeling. Then there are also a

number of papers that collaborate between qualitative and quantitative approaches at once.

Author

Table 3 shows the top 4 rankings of the authors of the financial technology theme paper in the momentum of the Covid-19 pandemic in the past year.

Table 3. Top Authors

Description	Number of Paper
Khan, Shahnawaz	2
Muneeza, Aishath	2
Mustapha, Zakariya	2
Rabbani, Mustafa Raza	2

Based on the table above, there are 4 authors who wrote 2 papers published on the theme of financial technology in the momentum of the Covid-19 pandemic, as for the other authors who are not listed in the table above, out of 123 authors, minus the top 4 authors, there are 119 authors who wrote only 1 paper published on the theme of financial technology in the momentum of the Covid-19 pandemic.

Journal

The following table shows the journals that are productive in publishing papers on the theme of financial technology in the momentum of the Covid-19 pandemic.

Table 4. Top Journals

Country	Total
EJIF: International Journal of Islamic Economics and Finance	3
EJIF: European Journal of Islamic Finance	2
Impact of Financial Technology (FinTech) on Islamic Finance and Financial Stability	2
International Journal of Financial Studies	2
Journal of Digital Marketing and Halal Industry	2
Qualitative Research in Financial Markets	2

The table above shows the ranking of journals that have published the most papers on the theme of Financial technology in the momentum of the Covid-19 pandemic in the past year. In the first rank, the journal EJIF: International Journal of Islamic Economics and Finance surpasses other journals with a total of 3 papers published. Then the second to seventh rank is occupied by several journals that publish their papers as many as 2 papers.

I. Graphical Analysis Bibliography

To explore the results of the meta-analysis in the third section, this fourth section will present a graphical visual mapping of paper publications on the theme of financial technology in the momentum of the

Covid-19 pandemic. The results of the mapping analysis of keywords are the basis for *co-occurrence* mapping of important or unique terms contained in certain articles. Mapping is a process that allows one to recognize knowledge elements and their configurations, dynamics, interdependencies, co-occurrence and interactions.

Related to bibliometrics, science mapping is a method of visualizing a field of science. This visualization is done by creating a landscape map that can display topics from science (Royani, et al., 2013). The results of the *network* visualization of the *co-word* map of paper publications on the theme of financial technology in the momentum of the Covid-19 pandemic can be seen in Figure 1.

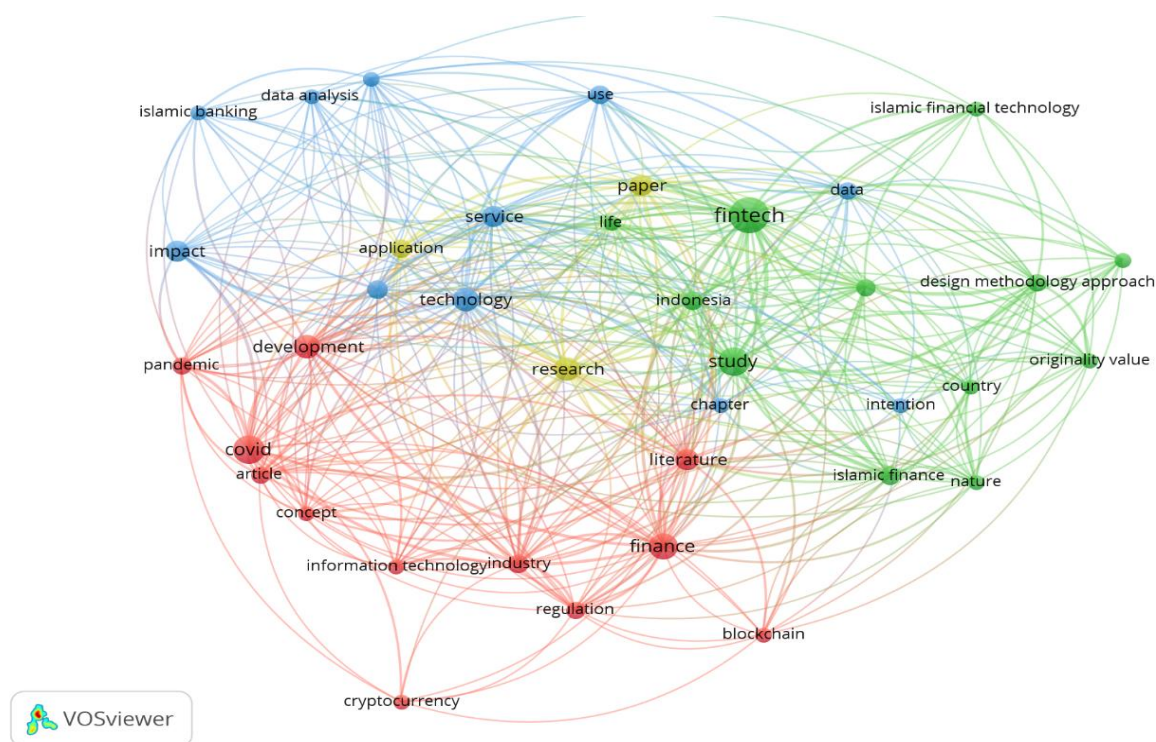


Figure 1. Bibliometric Keyword Mapping

In this mapping, several keywords that frequently appear in papers on the theme of Covid-19 and the halal food industry in the past year and their relationship with other keywords in 4 clusters are displayed, namely:

- Cluster 1 in red consists of 12 keywords, namely *article, blockchain, concept, covid, cryptocurrency, development, finance, industry, information technology, literature, pandemic, regulation*.
- Cluster 2 in green consists of 12 keywords, namely *country, design methodology approach, financial inclusion, fintech, indonesia, islamic finance, islamic financial technology, islamic fintech, life, nature, originality value, study*.
- Cluster 3 in blue consists of 11 keywords, namely *chapter, data, data analysis, impact, intention, islamic bank, islamic banking, relationship, service, technology, use*.
- Cluster 4 in yellow consists of 3 keywords namely *application, paper, research*.

The keywords divided into 4 clusters above are arranged in the form of colored circles indicating clusters, this data can be used in determining keyword trends in the past year. The bibliometric analysis shows some keywords that are widely used in the papers that are the object of study. The most frequently occurring keywords are indicated by the larger the circle. Meanwhile, the relationship between keywords shows how much it is related to other keywords. It was found

that the most familiar keywords were *fintech, finance, covid*.

Furthermore, using the VOSViewer software, we found the bibliometric mapping of the authors as shown in Figure 2 above. The larger the circle of the author's name, the more papers he/she has published on the theme of financial technology in the momentum of the Covid-19 pandemic in the past year.

The cluster density view, represents *items* (labels) that are marked the same as the visible *items*. Each *item* point has a color that depends on the density of the *item* at that time. This identifies that the color of a point on the map depends on the number of *items* associated with other items. This section is very useful to get an idea of the general structure of the bibliometric map by paying attention to the items that are considered important to analyze. Through this worksheet, we can interpret the author who wrote the most publications.

Based on these results, a density map is displayed, which is the result of an analysis using all articles published on the theme of financial technology in the momentum of the Covid-19 pandemic, both related and unrelated. There are many clusters when sorted by author (shown by the circle color). The most popular authors writing publications related to the theme of financial technology in the momentum of the Covid-19 pandemic based on bibliometric mapping are Arner, Douglas W and Birau, Ramona.

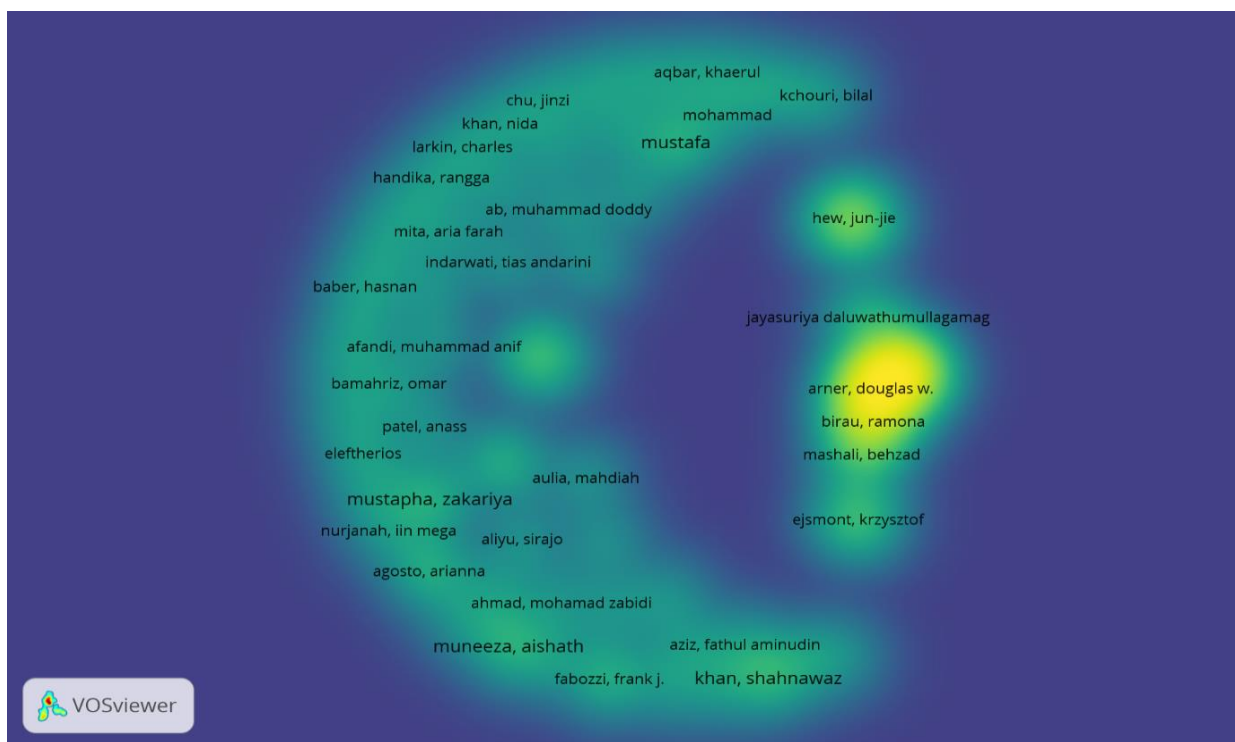


Figure 2. Bibliometric Author Mapping

The order in this mapping may have differences with the top ranking of authors if we calculate manually, but in addition to calculating the quantity of the number of papers published on the theme of financial technology in the momentum of the Covid-19 pandemic, VOSViewer also takes into account the number of links and citations with other authors.

Furthermore, the visualization of journal mapping is depicted in bibliometric Figure 3. Based on this figure, there are several journal clusters that appear to be listed in glowing circles, indicating the productivity of these journals in contributing to publishing papers on the theme of financial technology in the momentum of the Covid-19 pandemic.

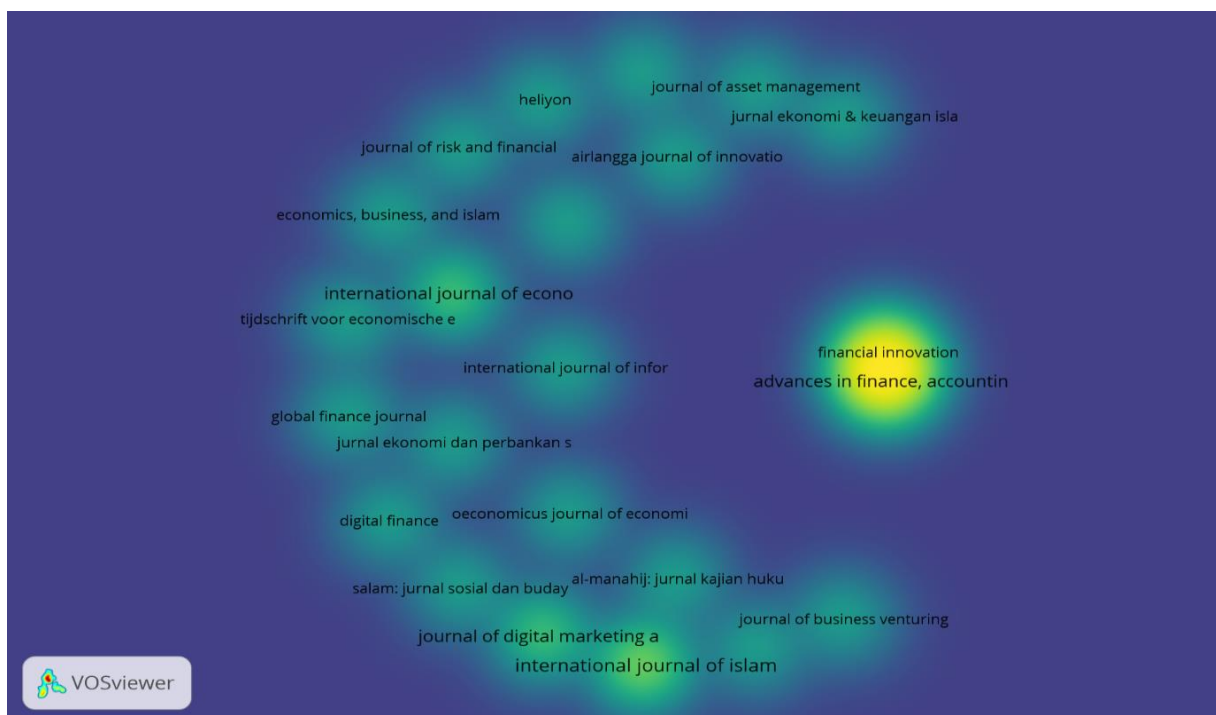


Figure 3. Bibliometric Journal Mapping

Most journals in terms of number of publications and number of links to other journals, where a paper author can write many papers in different journals. The most popular journal ranking

shown by the bibliometric mapping results in the first place is *Advances in Finance, Accounting and Economics*, in the second place is *Financial Innovation* and in the third place is the *International Journal of Financial Studies*.

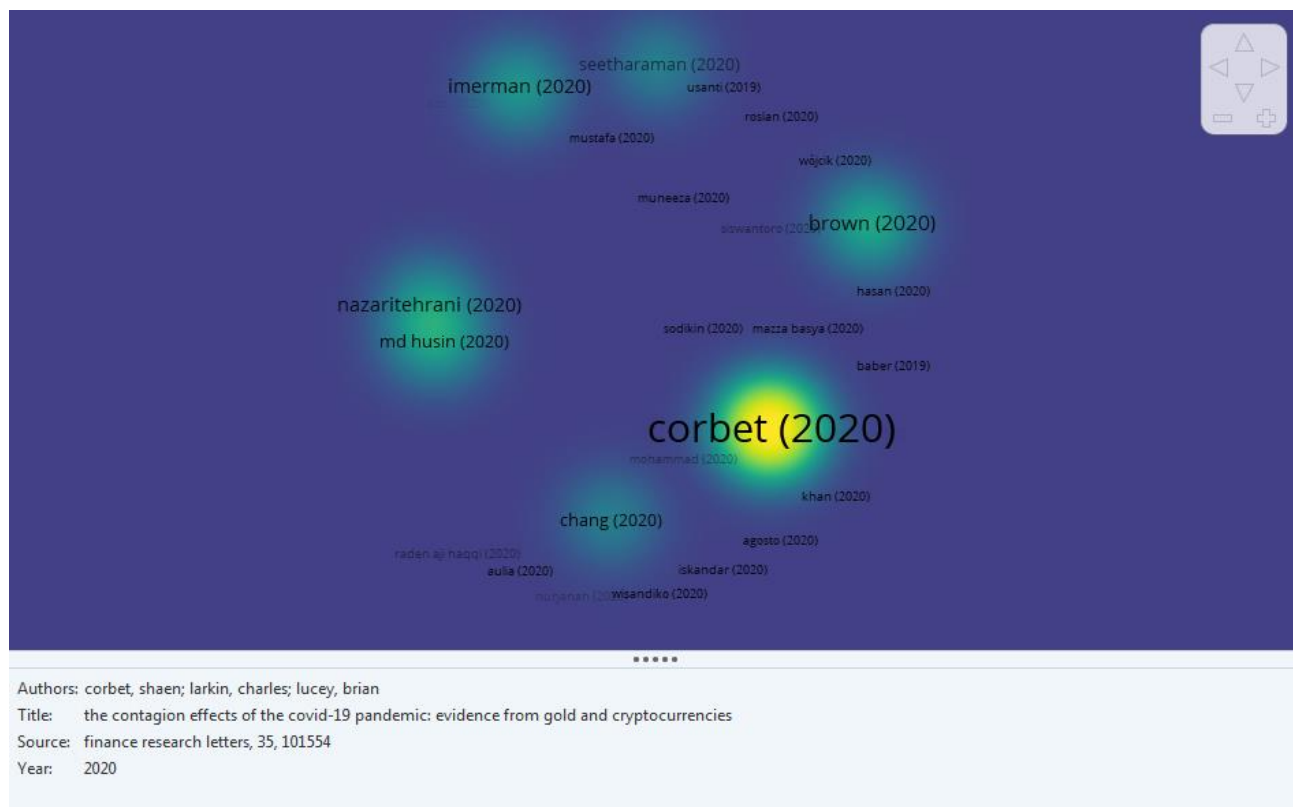


Figure 4. Bibliometric Citation Mapping

The results of data processing show that the most citation mapping in the financial technology theme paper in the momentum of the Covid-19 pandemic. The results of the VOSViewer analysis show that the most cited paper in the first rank is [Corbet \(2020\)](#).

Findings

The Covid-19 pandemic has also had an impact on the economy, with lock-downs in several countries, store closures, large-scale social restrictions, physical distancing and so on impacting economic health. ([Chang & McAleer, 2020](#)). This situation stimulates businesses and governments to empower financial technology to help the economy that is in crisis. ([Seetharaman, 2020](#)). Providing benefits and assistance to the community can be done through fintech, especially Islamic fintech so that it can be adapted to Islamic financial instruments, such as Islamic social finance; zakat, infaq, shadaqah, waqf to certain contracts such as qardhul hasan. ([Syed et al., 2020](#)).

The use of technology to manage finances and businesses to keep running as usual is certainly very potential to solve the problem of distance and time differences. The types of facilities provided by fintech also vary according to the needs of their users. ([Wisandiko & Indarwati, 2020](#)). For example, payment gateways that facilitate the process of payment and collection of funds using e-wallets so as to reduce the use of cash which is a possible medium for transmission of Covid-19. Fintech can also provide relevant real time data and information only through mobile phones for all users, making it very much more efficient. ([Agosto & Giudici, 2020](#)).

In addition, fintech also provides facilities in conducting various kinds of financial transactions only with applications without the need to meet physically. The development of fintech continues to increase along with the growth of mobile phone users around the world, especially during the Covid-19 pandemic. ([Yazici, 2020](#)) In addition, the quantity of its use is increasingly frequent, increasing the demand for the use of electronic transaction methods in various fields.

(Revathy & Balaji, 2020) This need is also closely related to the goal of facilitating the liquidity of online market players to help MSMEs continue to earn income by utilizing market places as a place to trade (Iskandar et al., 2020).

The implementation of financial technology certainly requires the support of good and advanced digital technology, as well as easy access to the internet for all levels of society. (Brown & Rocha, 2020) It is hoped that there will be no gap between one person and another, or one region and another because it is still new and needs adaptation (Imerman & Fabozzi, 2020). In addition, support from various parties, especially the government, in dealing with the effects of Covid-19 and preparing everything related to the technical implementation of alternatives is very necessary (Corbet et al., 2020) If this is already available as a whole, then realizing a cashless economic system is possible to be implemented. (Allam, 2020).

The application of this financial technology has a great opportunity to be accelerated, the recovery of the country's economic and financial situation must certainly be addressed immediately by helping to provide a good and effective system for the community. (Wójcik & Ioannou, 2020) In the end, it is expected to shape and improve the economic and social welfare of the society in general and the financial industry in particular. (Daluwathumullagamage & Sims, 2020) through technological development so as to realize a digital method of working and doing business. (Sodikin, 2020) which of course remains in accordance with Sharia principles (Junusi, 2020) so that its implementation is based on Islamic law and has been guaranteed and regulated by the MUI National Sharia Council (Basya et al., 2020).

CONCLUSION

The focus of this research is trying to find out the extent of the development of the theme of financial technology, in this case Islamic fintech in the momentum of the Covid-19 pandemic in the world. The results show that there is an increase in the number of paper publications on this theme compared to other themes, until September 2020, there have been 50 studies on this theme over the past year.

The top three research topics that are widely used are *fintech*, *finance*, *covid*. The research approaches taken are qualitative as many as 34 papers, quantitative as many as 12 papers and mixed as many as 4 papers. The most productive authors who wrote more than 1 paper were 4 people. The most productive journal is

EJIF: International Journal of Islamic Economics and Finance with the publication of 3 papers.

Visualization of bibliometric mapping shows that the map of research development in the field of financial technology in the momentum of the Covid-19 pandemic is divided into 4 clusters. Cluster 1 consists of 12 topics, cluster 2 consists of 12 topics, cluster 3 consists of 11 topics, and cluster 4 consists of 3 topics. The journals that publish the most articles related to the theme of financial technology in the momentum of the Covid-19 pandemic are *Advances in Finance, Accounting and Economics, Financial Innovation and International Journal of Financial Studies*. The paper with the most citations in the first rank is Corbet (2020).

Please note that the purpose of this research is to present an overview of the research trends on the theme of financial technology in the momentum of the Covid-19 pandemic, but the limitation is only in the last few months. While the research has been conducted using specific bibliometric indicators to provide readers with a general representation of the most significant data in this theme, the results presented are dynamic and may change over time as new trends emerge or variables increase or decrease in this theme in the future.

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