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Bibliometric analysis of research on Financial Technology (FinTech) in the ASEAN region: research streams, influential works, and future research paths

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Article Info

Abstract

Purpose – This paper aims to identify trends and map research on financial technology (FinTech) in the ASEAN region of interest to academics and practitioners, using VOSviewer to visualize bibliometric data.

Design/methodology/approach – This study uses a qualitative bibliometric approach by analyzing 88 publications sourced from the Scopus database. The dataset was converted to CSV format, processed using Bibliometrix, and visualized with VOSviewer.

Findings – This study revealed a significant increase in research on Financial Technology from 2019 to 2023, suggesting a growing interest among academics. Key terms such as Finance, Financial Inclusion, Banking, Financial Services, Financial Markets, Financial System, Innovation, Technology Adoption, Governance, and Technology Development were the most often used. These ideas are central to understanding FinTech's role in shaping economic and social systems. The findings further emphasize FinTech's significance for advancing financial inclusion, guiding public policy, strengthening financial stability, and accelerating the digital economy. Thus, advancing research and development in this area is essential for fostering innovation and inclusive growth.

Research limitations/implications – The main limitation of the research should be the use of data only from the Scopus database.

Practical implications – This paper guides academics and practitioners in understanding the key trends and focus of FinTech research. The results also help support FinTech policy development and innovation in the ASEAN region.

Originality/value – This study contributes by concisely summarizing FinTech research trends in ASEAN and introducing a computer-assisted bibliometric method for conducting systematic literature reviews.

keywords: Financial Technology, Technology Adoption, Innovation and Technology Development.

Introduction

Technology makes the use of resources more accessible and much more efficient (Chen et al., 2021). It is making technology more and more enjoyed and used by the community. One of the technologies that has developed in society is the internet (Hussein et al., 2021). The rapid development of the internet has led to various innovations, including financial technology to meet

people's needs. Technology makes financial services more accessible and efficient (Dorhetso, 2023). Applying technology in financial services greatly helps people's activities in transactions (Dorhetso, 2023). These changes have led to a new phenomenon called Financial Technology or Fintech (Yap, 2023). Fintech is a financial service using a technology base that will make transactions more straightforward anywhere and anytime (Hudz, 2024). Fintech is becoming increasingly easy to use and recognized by the wider community. Practical payments are far different from conventional payment methods, making fintech development even more intense (Karakas & Stamegna, 2018).

FinTech's ability to help with financial inclusion, especially for people previously inaccessible to traditional banks, is one of its main advantages (Hudz, 2024). With mobile payment apps and micro-lending platforms, financial services are now more accessible to consumers and small businesses in many countries, enabling them to take part in economic activities that were previously out of reach (Beck, 2020). This more accessible access to credit, investment, and other financial products has helped drive faster economic growth while creating more opportunities for people to improve their well-being and grow their small businesses (Wang, 2024). However, amidst the rapid development of FinTech, governments in various countries must continue to adapt to these advancements (Choi et al., 2019). Effective regulation is needed to ensure consumer protection. FinTech often disrupts established boundaries within the traditional financial industry, presenting new challenges related to data security, privacy, and financial system stability (Gomber et al., 2018). This requires governments to make a balanced framework between encouraging innovation and ensuring adequate protection for consumers and businesses (Wang, 2024).

Financial Technology (FinTech) has experienced significant growth and impact in the ASEAN region, with several critical technological advancements driving this development (Toan Bui & Thi Doan, 2024). FinTech adoption has substantially affected the region, presenting both opportunities and regulatory challenges (Loo, 2019). With a significant impact on financial inclusion over the years, the region has seen advancements in mobile banking, digital banking, blockchain, AI, ML, digital payments, and Insurtech (Ha et al., 2025). International FinTech entities, digital banks, and significant technology firms in the financial sector has propelled more de facto economic integration within the region (Toan Bui & Thi Doan, 2024). The ASEAN region is touted as a stable and attractive investment area with significant potential for FinTech growth to meet the financial services needs of marginalized regions (Loo, 2019).

The ASEAN region presents opportunities to expand FinTech services, especially in crowdfunding, neobanks, and InsurTech, driven by positive attitudes towards entrepreneurship and asset investment (Imam et al., 2022). The high adoption rate of mobile banking and borderless financial cooperation in the region, coupled with the large amount of tech talent in demand, will drive the rapid development of FinTech in the area (Wu & Kao, 2022). The economic transition in ASEAN countries, such as Vietnam, Laos, and Cambodia, from subsistence economies to industrialized product and service sectors has created new opportunities to develop FinTech services (Loo, 2019). These countries are seeing increased demand for more efficient financial services, especially in terms of digital payments, access to credit, and affordable insurance (Ha et al., 2025). The growth of the industrial and service sectors has also created a need for more sophisticated financial management solutions, opening up space for FinTech companies to offer innovative products that support local businesses (Loo, 2019). This combination of high technology adoption, abundant local talent, and changing economic dynamics makes ASEAN a promising region for developing and innovating digital financial solutions, ultimately improving financial inclusion and driving economic growth in the area (Ha et al., 2025)

Some research on Financial Technology (FinTech) has been conducted, and research conducted by (Adke et al., 2022) Discusses the Impact of Disruptive Technologies on Customer Experience Management In ASEAN: A Review. Financial institutions need to consider the strategies that need to be implemented to remain competitive in the era of rapid digitalization. One of the key strategies is the gradual and planned adoption of disruptive technologies, which enable banks to offer more personalized, efficient, and data-driven services—the importance of investing in robust digital infrastructure and human capital training to ensure readiness for technological

change. Research from (Gharaibeh, 2024) Discusses the Determinants affecting the intention to adopt financial technology. Several essential elements, including perceived utility, simplicity of use, trust, social influence, and enabling conditions, affect users' intentions to adopt fintech. Perceived usefulness and ease of use determine how effective and easy Fintech services are for users. Trust is essential to ensure security and privacy, while social influence reflects encouragement from the community or people nearby. Helping with conditions such as infrastructure and technical support also play a role in promoting adoption. Then, research from (Jourdan et al., 2023) Discusses Fintech: A content analysis of the finance and information systems literature. Fintech covers many innovations that use technology to improve financial services, including digital payments, peer-to-peer lending, automated investment management, and data-driven insurance. Most studies focus on exploratory methodologies, reflecting efforts to understand this new part of the financial sector, such as user experience and its impact on consumer behavior.

This explanation indicates that Financial Technology (FinTech) has significantly transformed the financial services sector, particularly in the ASEAN region. Using technology, FinTech can improve the efficiency and accessibility of financial services, providing convenience in transactions anytime and anywhere. The ASEAN region is a fertile ground for FinTech innovation, offering great potential for service development. Adopting strategies by financial institutions, including investment in digital infrastructure and human resource training, is critical to meet the challenges and capitalize on the opportunities. The research emphasizes the identification of research advancements, the contributions of particular authors or research groups, and the comparison of new research themes.

This offers a comprehensive assessment of the present situation while identifying knowledge gaps that require further investigation in future studies. This project will employ bibliometric analysis to produce recommendations and practical instructions for examining Financial Technology trends in the ASEAN region. This study assesses the evolution of research on Financial Technology within the ASEAN area. This study employs bibliometric analysis with VOSviewer software. VOSviewer software is a research analysis tool used to evaluate the performance of a researcher, research group, institution, country, or journal. This analysis is significant as it offers insights beyond the journal's scope.

Literature Review

Overview of Financial Technology (FinTech)

FinTech denotes technology and innovations that revolutionize the delivery of financial services and rival conventional financial institutions, encompassing mobile payments, digital banking, insurance, wealth management, cryptocurrencies, and cross-border payments (Yap, 2023). FinTech is essential in transforming the financial sector by enabling the ease of delivering financial services, ensuring transaction integrity and accuracy, and providing innovative solutions for services (Lubis et al., 2021). FinTech covers many products, innovations, and business models, including mobile money, digital wallets, open banking, artificial intelligence, crowdfunding sites, robo-advisors, and virtual currencies (Puri & Singh, 2024). These parts are transforming traditional financial services, increasing efficiency, and improving accessibility and security for consumers and businesses, thus changing the financial landscape (Gopal et al., 2023).

FinTech is spreading rapidly worldwide, driven by technological advancements such as the Industrial Internet of Things (IIoT), AI, smartphone apps, cryptocurrencies, virtual reality, digital twinning, and 5G (Gopal et al., 2023). FinTech adoption promotes financial inclusion for consumers and businesses by improving the accessibility, use, and quality of financial products, thus promoting economic growth and social equity (Abis et al., 2025). FinTech significantly affects access to financial services, reduces financial exclusion, and increases opportunities and empowerment among customers, especially the underprivileged (Shili & Panjwani, 2022). FinTech is revolutionizing financial operations on a global scale, transforming traditional financial services, and offering a wide range of banking and non-banking financial services, thus ensuring global acceptance of innovation (Minz et al., 2024).

FinTech Evolution and Growth Worldwide

The ASEAN region has experienced significant growth in the FinTech sector, with countries such as Singapore, Thailand, Malaysia, Vietnam, Indonesia, and the Philippines showing substantial progress (Ha et al., 2025). The region's financial services sector is experiencing significant growth, driven by digitization and the emergence of FinTech companies, which account for about 8% of the overall GDP (Banerjee, 2020).

Governments across ASEAN are building the foundations for open finance to offer integrated financial services focusing on a digital, seamless and empathetic customer experience (Adke et al., 2022). The main goal of the open finance framework is to offer a fully digitized and anticipatory customer experience, driving innovation and boosting growth (Banerjee, 2020). The study on the ASEAN region proposes specific recommendations for governments to drive their respective FinTech markets, showing a proactive approach to government initiatives (Truong, 2024). The compilation of the FinTech Index for 2017 to 2019 shows that Singapore has the strongest FinTech ecosystem in ASEAN countries, followed by Thailand, Malaysia, Vietnam, Indonesia, and the Philippines, highlighting the different levels of development across the region (Zheng et al., 2022). Studies in the ASEAN region emphasize the need for innovative promotion and education to motivate more sceptical demographic groups, such as women and the elderly, to adopt FinTech services, pointing to challenges related to adoption and inclusiveness (Imam et al., 2022).

Key Research Streams in Indonesian and Malaysia FinTech

FinTech adoption significantly improves environmental, economic, and social sustainability in ASEAN countries when income disparities are reduced. FinTech lending is spreading in Indonesia, offering reasonable interest rates and access to conventional financial institutions, and is expected to support the financial inclusion planned by the Indonesian government (Wirani et al., 2021). The growth of FinTech lending is expected to support financial inclusion planned by the Indonesian government, and factors such as trust and safety in online lending platforms, personal innovation, interest rates, and familiarity influence the adoption of FinTech lending companies in Indonesia (Wirani et al., 2021).

In Malaysia, FinTech has significantly transformed banking services, including payment solutions, personal loans, and online banking, driven by financial literacy programs and a supportive regulatory framework (Alsmadi et al., 2023). The Malaysian government has set up several initiatives to encourage and deliver strong growth in Malaysia's FinTech and digital assets regulatory environment, with the hope of Malaysia becoming a cashless society to increase financial inclusion (Alsmadi et al., 2023). Malaysia has integrated blockchain technology in its Islamic FinTech sector to improve transparency of transactions and compliance with Shariah principles (Mohamad et al., 2024). The Islamic fintech sector in Malaysia focuses on empowering small and medium enterprises, the unbanked population, marginalized communities, and vulnerable sectors to drive financial inclusion in Malaysia (Mohd et al., 2024). Comprehensive personal data protection laws in Malaysia support the safe use of FinTech, in contrast to Indonesia's less developed regulatory framework (Nurhasanah & Rahmatullah, 2020a).

Challenges and Opportunities in Indonesian and Malaysia FinTech

Regulatory challenges hindering FinTech adoption in Indonesia include legal uncertainty, lack of FinTech-specific legislation, and fragmented regulation across civil, administrative, and criminal sectors (Nurhasanah & Rahmatullah, 2020b). The lack of a comprehensive legal framework for FinTech in Indonesia has led to problems such as illegal FinTech practices and lack of consumer protection (Saifullah et al., 2024). Cybersecurity significantly affects FinTech growth in Indonesia, with security risks having the greatest negative impact on FinTech adoption intentions (Haqqi & Suzianti, 2020). Illegal FinTech practices and unauthorized misuse of consumers' data highlights the importance of addressing cybersecurity issues in the FinTech sector (Saifullah et al., 2024). Indonesia's FinTech sector presents opportunities for growth and innovation, especially in the fast-

growing Islamic FinTech industry with market potential (Saifullah et al., 2024). FinTech expansion opportunities in the ASEAN region, including Indonesia, vary across different FinTech services, such as crowdfunding, neo bank, and InsurTech (Imam et al., 2022).

The rapid advancement of technology and the accelerated pace of digitization has also boosted the acceptance of FinTech among industry players in Malaysia. However, the lack of proper regulation for Shariah-compliant FinTech in Indonesia is a concern (Susilawati et al., 2021). The exponential expansion of the FinTech sector in Malaysia highlights the need for strong risk mitigation measures covering data security and operational resilience (Mohamad et al., 2024). The study on Islamic FinTech in Malaysia emphasizes the importance of awareness campaigns introducing Islamic FinTech to target countries and segments such as the younger generation and female population (Billah et al., 2021). The Islamic FinTech sector in Malaysia focuses on empowering small and medium enterprises, the unbanked population, and marginalized communities to drive financial inclusion (Mohd et al., 2024). Islamic FinTech innovation positively affects banking performance in Malaysia, especially small banks, and can contribute to economic growth (Rickinghall, 2022). Factors such as Shariah compliance, site aesthetics, efficient and reliable services, and promise fulfillment significantly affect customer satisfaction in Islamic banks for FinTech services offered (Baber, 2019). In addition, the impact of FinTech services, particularly in payments, advisory, and compliance, affects customer retention at Islamic banks (Baber, 2020).

Malaysia has a well-developed regulatory framework and active government support for Islamic FinTech, which contributes to the country's strong position on the Global Islamic FinTech Index (GIFT) (Mohamad et al., 2024). Studies on Islamic FinTech regulation in Indonesia and Malaysia highlight the need for supportive regulations, Shariah supervisory boards, and Islamic FinTech Shariah governance standards to strengthen regulation and supervision of the Islamic finance industry (Muryanto, 2023).

Research Methods

This research uses a qualitative method with a literature study approach by emphasizing bibliometric studies. Bibliometric studies develop and map a particular study (Setyaningsih et al., 2016). This approach involves using bibliographic data, such as citations, number of publications, and journals published, to identify trends, patterns, and structures in academic knowledge production (Akram et al., 2022; Xiao & Li, 2021). Bibliometric analysis offers several more advantages, such as identifying knowledge foci that require further investigation and showing the most popular research topics in a particular field. In conducting research analysis, the author uses the Vosviewer application to help to analyze and visualize research data.

The data in this study included articles published between 2019 and 2023 (the last five years) in journals published in the Scopus database. The consideration of using the Scopus Database as a data source is this database is one of the two most important databases and high-standard journal articles. Articles retrieved from Scopus in this literature review come from 88 journals downloaded from Scopus in the format of; TITLE-ABS-KEY ("Financial Technology") AND PUBYEAR >2019 AND PUBYEAR < 2023 AND (LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (AFFILCOUNTRY, "Indonesia") OR LIMIT TO (AFFILCOUNTRY, "Malaysia") OR LIMIT-TO (AFFILCOUNTRY,"Brunei Darussalam") OR LIMIT-TO (AFFILCOUNTRY,"Philippines") OR LIMIT TO (AFFILCOUNTRY, "Singapore") OR LIMIT TO (AFFILCOUNTRY, "Thailand") OR LIMIT-TO (AFFILCOUNTRY, "Viet Nam")).

Figure 1 presents the criteria and filters we used for data collection and analysis techniques. It is illustrates the literature selection process as described in the modified PRISMA diagram, which shows the stages of searching, selecting, and collecting documents for analysis. In the initial search stage, 2,208 articles were identified through the Scopus database. The initial screening process was carried out by applying several filters based on document type (journal articles), publication stage (final), source type (journal), and publication language (English). After this stage, several documents were removed due to duplication (n = 1,322), automatic incompatibility by the system (n = 372),

and other reasons such as incomplete metadata (n = 193), leaving 321 documents for the next screening stage.
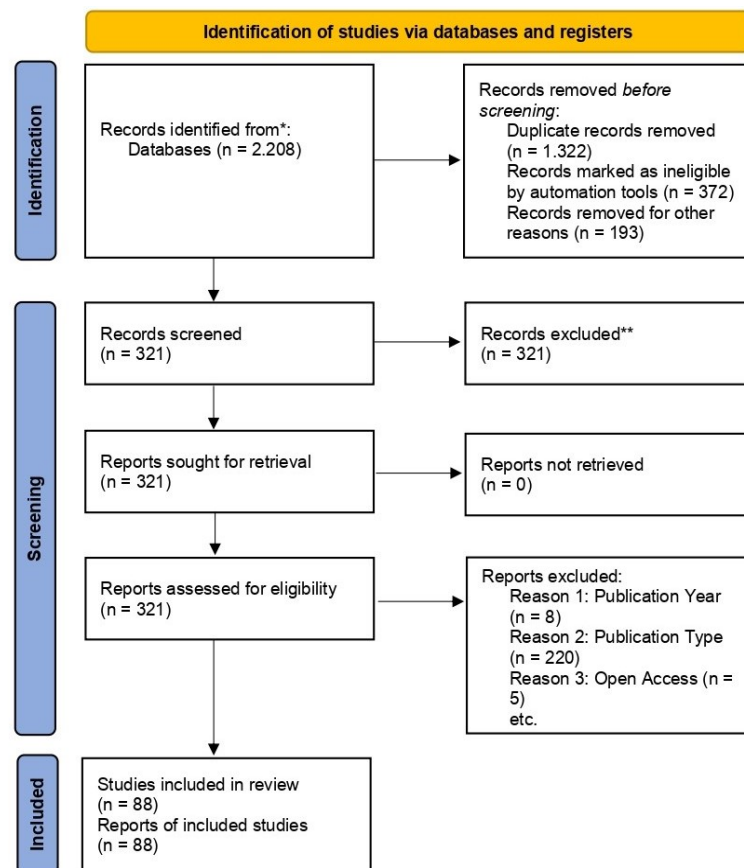
Figure 1. The PRISMA flow diagram identifies, screens, and includes papers for our bibliometric review (Source Fig: Processed by Author 2024).

The advanced screening stage was conducted by narrowing the search scope using specific keywords related to the research topic, specifically 'Financial Technology' in Social Sciences, and ensuring these keywords in the article's title, abstract, and list of keywords. The publication time frame was also limited to between January 1, 2019, and December 31, 2023, to ensure the relevance of the findings to the current context. After going through this process, 88 final articles that met the inclusion criteria were obtained and analysed using a bibliometric approach. Applying the PRISMA method tries to ensure transparency, accountability, and replicability in the literature selection process used in this study.

Data normalisation was performed before bibliometric analysis to ensure data consistency and reliability. The normalisation process included: manual and automatic data cleaning using Scopus export files in CSV format to remove inconsistencies in author names, institutional affiliations, and keyword variations; removal of duplicates detected through similarities in DOI and title; and standardisation (harmonisation) of metadata fields to match the input format of the VOSviewer software. This step makes sure each document represents a unique data unit suitable for network mapping and further analysis. The analysis was conducted using VOSviewer software with three types of visualisation, namely network, overlay, and density, through two main approaches, namely evaluative analysis covering publication trends, number of citations, geographical distribution, and identification of the ten most productive authors and relational analysis covering relationships between keywords (co-occurrence), author collaboration (co-authorship), and co-citation relationships (van Eck & Waltman, 2010). Before mapping, keyword cleaning was performed (both manually and using the thesaurus in VOSviewer) to avoid term duplication.

For co-occurrence analysis, a minimum threshold of five occurrences of a keyword was applied; for co-citation analysis, only references with at least ten citations were included; and for bibliographic coupling, only documents with at least five shared references were considered. The clustering process was carried out using the complete counting method and association strength algorithm, with cluster naming performed inductively based on the dominant theme in each keyword group. The final results of this mapping were used to identify significant research trends, potential scientific collaboration between researchers and institutions, and research gaps that could support future research agendas in Financial Technology.

Results and Discussion

Result

General information and annual publication output

Figure 2 shows the number of publications per year from 2019 to 2023 for the set of 88 publications. The number of publications has gone up significantly in recent years. This underscores the increasing relevance of the Financial Technology theme. The following is a visualization of the development of Financial Technology studies in the last five years.
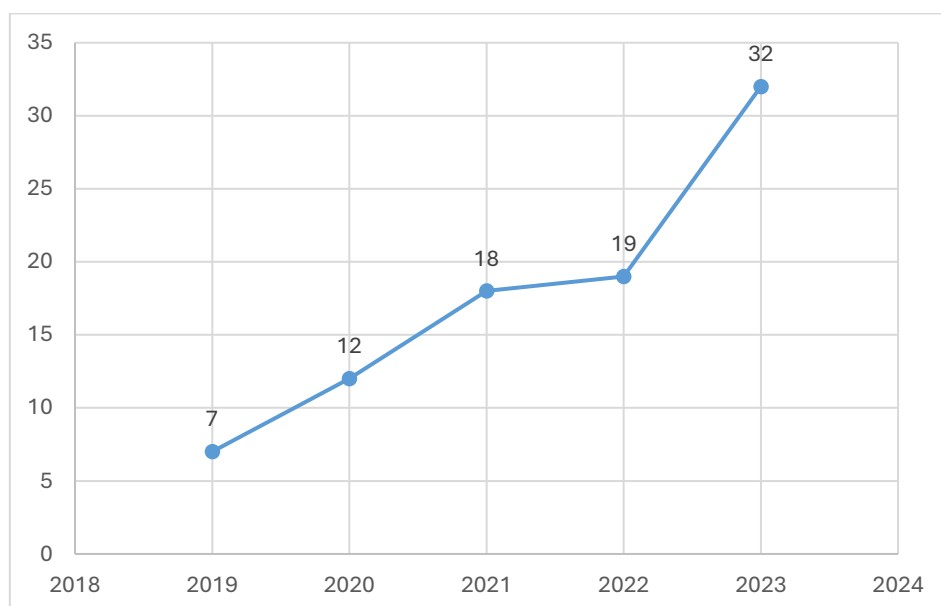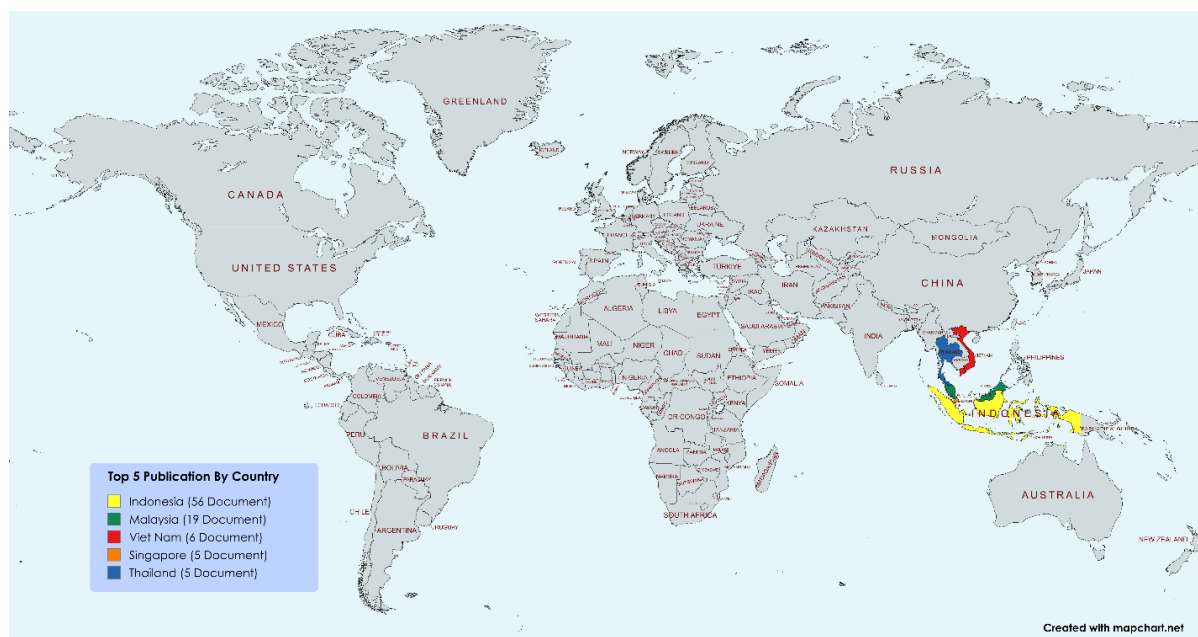

Figure 2. Global trends in the publication on Financial Technology in the ASEAN Region from 2019 to 2023. Source: Scopus

In Figure 2 above, the development of studies on Financial Technology (FinTech) in the ASEAN region from 2019 to 2023 shows an increasing trend in line with the rapid adoption of financial technology worldwide. In 2019, 7 documents were published, marking the beginning of increased academic attention to FinTech in ASEAN. This trend continued to show positive growth, with 12 documents in 2020, illustrating the growing interest in studying financial technology. The increase continued in 2021, with 18 documents, reflecting more widespread adoption and advancements in FinTech research. In 2022, the number of publications reached 19 documents, showing steady growth, although not as fast as the previous year. The peak comes in 2023, with 32 documents published, almost double the previous year, suggesting a significant surge in research interest and adoption of digital technologies in the financial sector. This increase shows that FinTech is increasingly becoming a significant research focus in ASEAN, driven by various factors, including technological innovations, such as digital payments, blockchain, and AI in financial services. These developments also reflect the growing need for efficient and secure digital financial solutions in the region, encouraging academics to continue exploring the potential and challenges in the FinTech ecosystem.

General information and country publication output

ASEAN countries will contribute to scientific research publications related to financial technology from 2019 to 2023.

Figure 3. Top Countries Contributing to Financial Technology in the ASEAN Region from 2019 to 2023. Source: Scopus

Figure 3 shows the publication trend based on the global geographical distribution with the research period of 2019 to 2023. Relevant research contributions with the keyword "Financial Technology" (Fintech) in the ASEAN region from 2019 to 2023 are dominated by 5 central countries: Indonesia, Malaysia, Vietnam, Singapore, and Thailand. Indonesia leads with 56 documents, signaling a solid dominance in Fintech research. The high number of publications reflects the considerable interest and rapid growth of the Fintech sector in the country, supported by the widespread adoption of technology. Malaysia comes in second with 19 documents, showing an active role in driving innovation and research in this area, although still below Indonesia. Vietnam followed with 6 documents, signaling a growing interest in line with the country's increasing adoption of digital technology. Singapore and Thailand recorded 5 documents each, suggesting a balanced contribution. Singapore, as a financial center in Southeast Asia, is likely to focus on developing more specific financial innovations, while Thailand continues to increase research to support the digital economy. The contributions from these five countries reflect a collective effort in developing the Fintech ecosystem in ASEAN, which is expected to increase financial inclusion and drive digital economic growth in the region.

Top Five Publication Output

Table 1 shows that the document that is the primary reference in studying Financial Technology is Research from (Arner et al., 2020) which in the study explores Sustainability, FinTech, and Financial Inclusion. The research findings explain that the potential of FinTech in achieving SDGs can be realized through progressive digital infrastructure development, which is based on four pillars: (1) digital identity and e-KYC systems, (2) open electronic payment systems, (3) digitization of government services and payments, and (4) more comprehensive access to finance and investment through digital financial systems. These four pillars have great potential to transform finance sustainably, as well as the economy and society. The second most cited article by researchers on this theme is from (Leong et al., 2017) entitled Nurturing a FinTech Ecosystem: The Case of a Youth Microloan Startup in China, which explores organizations managing challenges and capitalizing on opportunities amidst the disruption brought about by technological

advancements in the financial sector. FinTech, through digital technology, creates strategic opportunities for companies to occupy niche markets in the financial sector, enables the use of non-traditional data for alternative credit scores, and increases financial inclusion for previously excluded market segments.

Table 1. Most Cited Article Top Five Publication

No	Document title	Authors/Year	Source	Cited by	H-Index
1	Sustainability, FinTech and Financial Inclusion	(Arner et al., 2020)	European Business Organization Law Review	275	Q1
2	Nurturing a FinTech ecosystem: The case of a youth microloan startup in China	(Leong et al., 2017)	International Journal of Information Management	227	Q1
3	Parallel Play: Startups, Nascent Markets, and Effective Business-model Design	(McDonald & Eisenhardt, 2020)	Administrative Science Quarterly	222	Q1
4	Analyzing China's Fintech Industry from the Perspective of Actor-Network Theory	(Shim & Shin, 2016)	Telecommunications Policy	173	Q1
5	An Empirical Study of the Impacts of Perceived Security and Knowledge on Continuous Intention to Use Mobile Fintech Payment Services	(Lim et al., 2019)	International Journal of Human-Computer Interaction	172	Q1

Source: Author

Network Development Trends and Research Density

This study displays the network and publication density of research on Financial Technology in 2019-2023. The analysis shows that the network tries to find out what keywords have a strong relationship with Financial Technology.
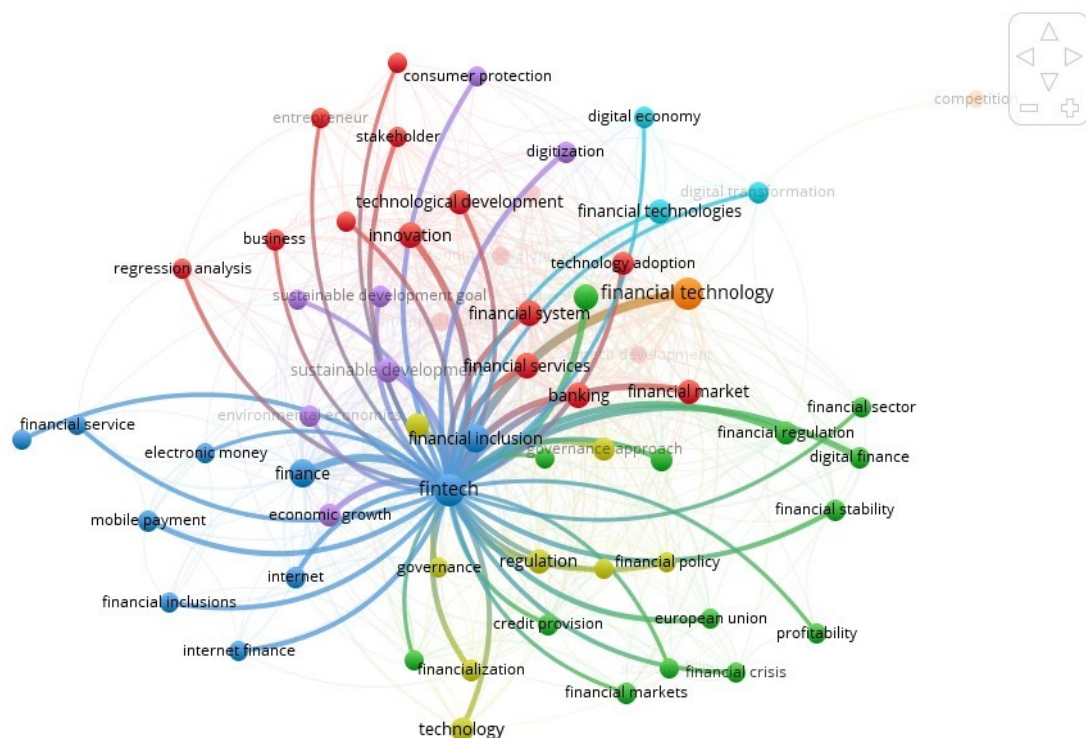

Figure 4. Network Mapping Based on Keywords
Source: Author's Data Processing Using VOSviewer

Figure 4 shows a complex network diagram or mind map showing the interrelated relationships between various ideas related to Financial Technology. This diagram shows the pivotal point of Financial Technology, which is the main subject of this study (Arroyave-Cabrera & Gonzalez-Pardo, 2022; Labafi et al., 2022). There are nodes of various sizes connected to the central node through lines, which represent the strength level or type of relationship between the ideas (Ji et al., 2020). Each node in the diagram is labelled with a keyword closely related to financial technology. Some keywords that can be seen include Fintech, Financial Inclusion, Financial Technology, Technological Development, Innovation, Financial System, Financial Service, Banking and Financial Market. Each keyword provides direction regarding the research focus and relevant conceptual areas. There are 7 clusters from the Network Visualization Vosviewer software results in the figure above including 61 themes related to Financial Technology, namely:

Table 2. Cluster Analysis Results

Cluster	Item Themes
Cluster 1	Banking, business, decision making, economic development, financial literacy, financial market, financial services, financial system, fintech development, innovation, institutional framework, regression analysis, stakeholder, technological change, technological development, technology adoption.
Cluster 2	Artificial intelligence, commerce, consumption behavior, credit provision, digital finance, European union, financial crisis, financial markets, financial regulation, financial sector, financial stability, machine learning, profitability.
Cluster 3	Electronic money, finance, financial inclusion, fintech, internet, internet finance, mobile payment, open banking.
Cluster 4	Financial policy, financialization, governance, governance approach, investment, microfinance, regulation, technology.
Cluster 5	Consumer protection, digitization, economic growth, environmental economic, public policy, sustainable development, sustainable development.
Cluster 6	Digital economy, digital transformation, financial technologies.
Cluster 7	Competition, financial technology
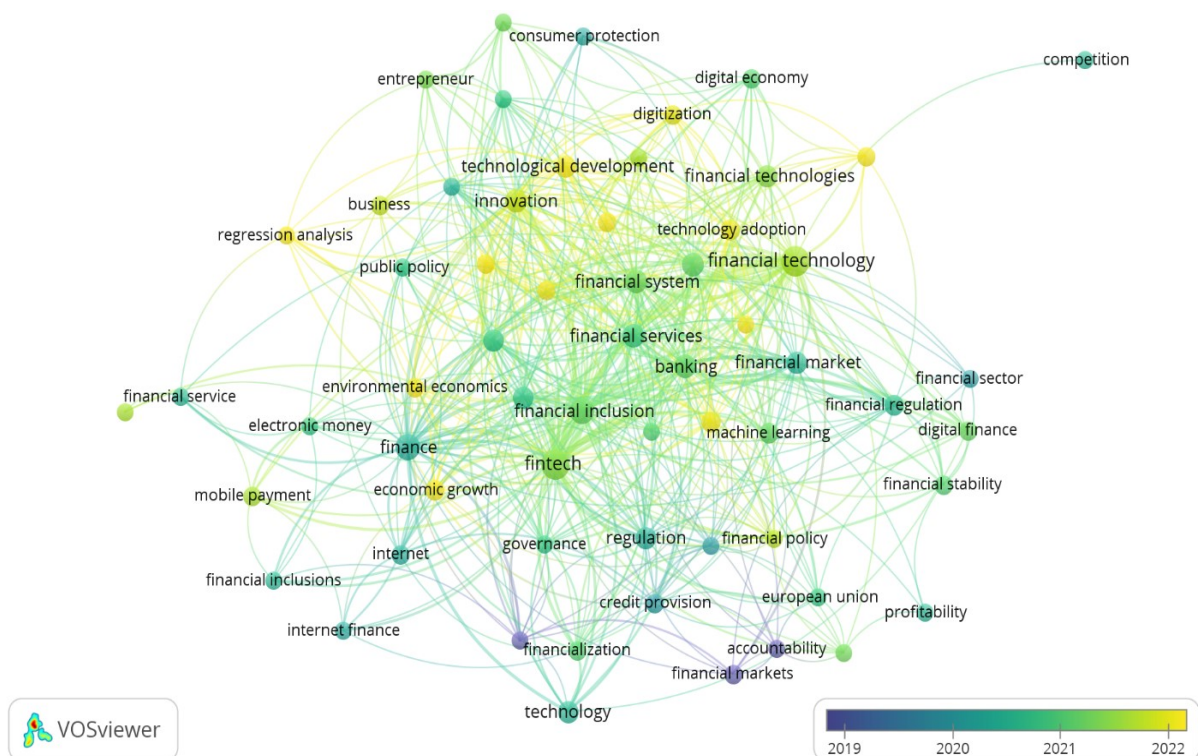
Figure 5. A snapshot of the development of Financial Technology studies from 2019 to 2023
Source: Author's Data Processing Using VOSviewer

Figure 5 above shows research trends from 2019 to 2023 on Financial Technology. In 2019, research on financial technology took a more in-depth look at the financial market, accountability, and commerce perspective. Then, in 2020, research on Financial Technology takes the viewpoint of Technology, Credit Provision, the Internet, Finance, Regulation, and the Financial Sector. Then, in 2021, research on Financial Technology takes the viewpoint of technology, Financial Market, Financial Regulation, Profitability, Financial Services, Electronic Money, Fintech, Financial Inclusion, Banking, Financial Services, Financial Systems, Financial Technology, Financial Stability and Digital Finance. Finally, in 2022-2023, research on financial technology shifts to discuss economic growth, financial policy, technology adoption, innovation, digitization, mobile payment, and technology development.

Figure 6. Visualization of Financial Technology overlay from 2019 to 2023
Source: Author's Data Processing Using VOSviewer

Figure 6 displays the density of research topics on Financial Technology based on keywords published in 2019-2023 and indexed by Scopus. Density analysis using Vosviewer visualization can see how many keywords have been discussed in a research domain. Keywords highlighted in yellow indicate topics that have received widespread attention, while weaker colours indicate less researched topics. This helps identify areas that are already a significant focus and topics with potential for further research. Figure 7 shows that Finance, Fintech, Financial Inclusion, Banking, Financial Service, Financial Market, Financial Services, Financial System, Financial Technology, Innovation, Technology Adoption, Governance and Technology Development often appear together in the literature under analysis, forming dense clusters. These terms are often discussed or connected regularly in the research.

Meanwhile, terms such as Internet Finance, Internet, Financial Policy, Financial Service, Public Policy, Digital Economy, Profitability, Financial Stability, Profitability, Accountability, Financial Markets, Financial Inclusion, Business, Profitability and Mobile Payment usually appear on the outer edges of the visualization, suggesting that these terms have been less researched or have fewer links to the main terms. This suggests potential for further research in these under-explored areas. By deepening the study of these areas, researchers may improve financial inclusion by applying new technologies and more responsive policies. Further research could also strengthen the link between technological innovation and the financial system, enabling technology to improve financial services' transparency, accountability and efficiency across sectors.

Discussion

In recent years, research on Financial Technology has become abundant as it is important to understand the ever-changing development of financial technology and its impact on the economy, business, and consumer behaviour. Research on Financial Technology (Fintech) covers various parts that aim to explore the potential of technology in improving financial inclusion, payment system efficiency, transaction security, and changing traditional business models. Thus, this research explains that it is interesting to see the publication trend every year, as the theme of research on financial technology (Fintech) has gradually developed. 2023 recorded the highest number of publications in the last five years. This shows the increasing interest and attention in research on financial technology (Fintech). In addition, it shows that Financial Technology (Fintech) is becoming an increasingly relevant research subject and is receiving greater attention from the academic community, business practitioners, and policymakers.

From 2019 to 2023, Scopus publications on Financial Technology (Fintech) experienced a consistent upward trend, as in Figure 2. This increase is due to various factors, such as the accelerated adoption of digital financial services, including electronic payments, peer-to-peer lending, and cryptocurrencies. This drives the need for research to understand their impact on the economy and consumer behaviour. This has prompted greater attention from academics, practitioners, and policymakers to examine various parts of Fintech. During this period, there has been a significant surge in cross-disciplinary collaboration to explore the potential of technologies such as blockchain, artificial intelligence (AI), and big data analytics to support financial inclusion, service efficiency, and data security. The push for more adaptive regulation has also been a critical catalyst, letting Fintech innovation flourish while maintaining stability and consumer protection. This increase in publications reflects Fintech's strategic role in the ongoing transformation of the global economy.

The research found that countries have contributed significantly to Financial Technology (Fintech). Indonesia is the only country with a correct and significant contribution, leading the way in publications related to Financial Technology (Fintech). Indonesia's leadership in the publication of research findings reflects the relevance of this topic globally and may reflect the availability of resources and the attention of relevant governments and institutions. This is corroborated by research from (Rahadjeng et al., 2023) entitled "The impact of financial literacy, financial technology, and financial inclusion on SME business performance in Malang Raya, Indonesia", which explains that Fintech emerged as an innovative element that plays an important role in bridging financial literacy with financial inclusion. The existence of fintech expands access to financial services and increases public understanding of digital financial management. With its ability to deliver faster, more accessible, and more affordable financial solutions, FinTech has become a strategic link between individuals' financial literacy levels and their opportunities to engage in the formal financial system.

Finance, Financial Inclusion, Banking, Financial Service, Financial Market, Financial Services, Financial System, Financial Technology, Innovation, Technology Adoption, Governance and Technology Development are the keywords with the highest occurrence and have the most important relationship with research on Financial Technology. This explains that Finance, Financial Inclusion, Banking, Financial Service, Financial Market, Financial Services, Financial System, Financial Technology, Innovation, Technology Adoption, Governance and Technology Development are the main ideas used to discuss the topic. This shows that Financial Technology cannot be separated from these critical ideas because they are interconnected in explaining the development and application of technology in the financial sector. The appearance of keywords such as Finance, Financial Inclusion, and Financial Technology reflects the research focus on expanding access to financial services through technological innovation. In addition, the linkage with Banking, Financial Services and Financial Markets shows the critical role of technology in supporting a more efficient and inclusive financial system. The Innovation and Technology Adoption ideas highlight the need to adapt new technologies to strengthen financial services. At the same time, Governance and Technology Development emphasize the importance of regulation and sustainable technology development. These ideas serve as a critical foundation in

understanding the Financial Technology ecosystem and its impact on financial inclusion and financial system stability globally.

Internet Finance, Internet, Financial Policy, Financial Service, Public Policy, Digital Economy, Profitability, Financial Stability, Profitability, Accountability, Financial Markets, Financial Inclusion, Business, Profitability and Mobile Payment are keywords that still have great opportunities to be the focus of discussion to become the novelty of future research. So further research and a deeper understanding of Financial Technology is essential to explore the potential and challenges offered by these ideas. Internet Finance and the Digital Economy provide opportunities to explore how digital technologies are changing how financial services are provided and accessed. Financial Policy and Public Policy highlight the importance of regulation in creating an ecosystem that supports innovation while maintaining financial stability. In addition, ideas such as Profitability, Financial Stability, and Accountability are relevant to measuring the impact of Financial Technology on financial performance and responsible governance. Mobile Payments and Financial Inclusion are critical areas in increasing the accessibility of financial services among previously underserved communities. Future research should focus on integrating these ideas to create a holistic understanding of Financial Technology, including how it can drive financial inclusion, support business growth, and ensure the sustainability of the digital economy.

The findings of this study show that Financial Technology has great potential to change the landscape of the financial sector by bringing innovations that improve accessibility, efficiency and financial inclusion. Through technology, fintech can reach people previously unserved by the traditional financial system, thus bridging the gap between the need for financial services and access to them. The potential of fintech is limited to the accessibility aspect and includes operational efficiency, where technology can automate financial processes, reduce transaction costs, and accelerate settlement times. This provides a great opportunity, especially for businesses, to gain easier access to funding and more affordable financial services, thus supporting their business growth significantly. Financial Technology also has a strategic role in strengthening financial stability through better risk management, higher transparency, and increased accountability in the financial system. With technologies such as big data, blockchain, and artificial intelligence, fintech can provide innovative solutions that improve user experience and support better financial governance. So fintech is not only a tool to drive economic growth but also a cause of innovation that connects the financial sector with the needs of modern society. This vast potential emphasizes the importance of further research to explore the opportunities and challenges in developing Financial Technology.

Conclusion and Future Direction

This study concludes that publications on financial technology indexed in Scopus between 2019 and 2023 have shown consistent annual growth, reflecting increasing scholarly attention to this field. Indonesia emerged as the leading contributor, with 56 documents addressing diverse parts of FinTech development. Bibliometric mapping indicates that core research themes include Finance, Financial Inclusion, Banking, Financial Systems, Technology Adoption, Governance, and Innovation. At the same time, areas such as Internet Finance, Public Policy, Digital Economy, Accountability, Financial Stability, Mobile Payment, and Profitability remain underexplored and present opportunities for further investigation. These findings underscore FinTech's dual role as a driver of financial inclusion and as a catalyst for broader transformations in public policy, financial stability, and global digital economy development. Advancing research and development in this area is essential for fostering innovation, strengthening regulatory frameworks, and enhancing the inclusivity of financial services.

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