

# Research Mapping on Fintech in Southeast Asia: Bibliometric Analysis and VOSviewer Visualization

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## ABSTRACT

This study explores the evolving landscape of Fintech research in Southeast Asia through a comprehensive bibliometric analysis using data from the Scopus database and visualized via VOSviewer. The analysis identifies key research themes, influential authors, collaborative networks, and temporal trends shaping the field. Results reveal five major thematic clusters: financial inclusion and digital transformation; machine learning and data-driven finance; blockchain and decentralized systems; risk and decision-making; and systemic development and regulation. The keyword overlay and heatmap visualizations indicate a temporal shift from technology-centered studies to more inclusive, impact-oriented research, particularly after 2021. Co-authorship and country collaboration networks highlight the dominance of China, India, and the United States, while Southeast Asia demonstrates growing but uneven scholarly engagement. This study contributes to a deeper understanding of the intellectual structure of Fintech research in the region and provides a strategic foundation for future academic inquiry, policy development, and digital financial innovation.

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## 1. INTRODUCTION

The rapid digital transformation across the globe has significantly influenced the financial services industry, giving rise to what is now widely known as Financial Technology (Fintech) [1]. Fintech refers to the innovative use of technology in the design and delivery of financial services and products, encompassing mobile banking, peer-to-peer lending, crowdfunding, blockchain, robo-advisory, and digital payment systems [2], [3]. Over the past decade, Fintech has disrupted traditional

banking and financial models, introducing greater accessibility, efficiency, and customer-centricity in financial services [4]. This disruption has not only reshaped consumer behavior but also prompted regulatory and institutional adaptation in both developed and emerging economies.

Southeast Asia has emerged as a dynamic region for Fintech innovation, largely driven by a combination of demographic, technological, and economic factors. The region, home to over 650 million people, features a large unbanked and

underbanked population, high mobile penetration rates, and a youthful digital-savvy demographic. These conditions have created fertile ground for Fintech companies to grow and experiment with novel financial solutions tailored to local markets [5]. Moreover, governments in countries such as Singapore, Indonesia, and Malaysia have introduced supportive policies and regulatory sandboxes to encourage Fintech development, thereby positioning Southeast Asia as a global Fintech frontier [6].

Academic interest in Fintech has grown in tandem with industry developments, with researchers examining diverse topics such as digital financial inclusion, regulatory challenges, cryptocurrency adoption, mobile payment behaviors, and the role of Fintech in SME financing. However, much of the scholarly attention has been concentrated on developed economies, while research on Fintech in emerging markets, particularly Southeast Asia, remains relatively fragmented. Despite the surge in Fintech-related publications in the region, there is a lack of systematic mapping to understand the evolution, trends, and intellectual structure of this field in the Southeast Asian context.

Bibliometric analysis offers a powerful methodological approach to quantitatively examine the landscape of academic literature. By analyzing patterns in authorship, institutional affiliation, country collaboration, keyword co-occurrence, and citation impact, bibliometric methods provide a comprehensive understanding of research trajectories, dominant themes, and emerging areas [7]. The use of tools such as VOSviewer further enhances this analysis by enabling the visualization of networks, clusters, and thematic evolution within the literature. In the context of Fintech research in Southeast Asia, bibliometric analysis can uncover how knowledge production has evolved across countries, which topics dominate the discourse, and where future research might be directed.

Given the increasing importance of Fintech in both practice and academia, there is a pressing need to consolidate existing

knowledge and map the scholarly landscape in a structured and visual manner. While prior bibliometric studies have explored Fintech at a global level [8], [9], few have narrowed their focus to Southeast Asia. A region-specific mapping is crucial because Southeast Asia's Fintech ecosystem is shaped by unique socio-economic, regulatory, and technological contexts that differ significantly from Western economies. Understanding these localized dynamics through bibliometric insights can inform scholars, practitioners, and policymakers aiming to foster inclusive and innovative financial ecosystems in the region.

Despite the growing number of publications on Fintech in Southeast Asia, there is a lack of a comprehensive bibliometric synthesis that maps research productivity, thematic focus, collaboration patterns, and citation impact within this emerging field. The absence of such a mapping not only limits our understanding of the intellectual structure of Fintech research in Southeast Asia but also constrains the ability of scholars and policymakers to identify research gaps, avoid redundancy, and build upon existing knowledge strategically. This study aims to conduct a bibliometric analysis and visual mapping of Fintech research in Southeast Asia using VOSviewer.

## 2. METHODS

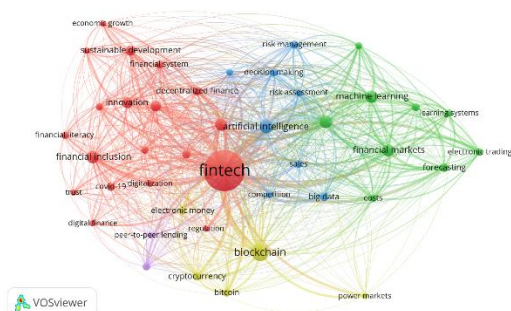
This study employed a bibliometric analysis approach to systematically map and evaluate the scholarly literature on Fintech in Southeast Asia. Bibliometric methods are widely recognized for their ability to quantify the volume, impact, and structure of scientific research through statistical and network-based techniques [7]. The analysis focused on publications related to Fintech with geographic relevance to Southeast Asian countries, allowing for the identification of core research themes, key contributors, and collaboration patterns. Bibliometric mapping serves as a valuable tool in highlighting research trends and guiding future inquiries, especially in fast-evolving domains such as Fintech.

The data for this study were collected from the Scopus database, which is considered one of the most comprehensive and reliable sources for academic publications across disciplines. A search query was constructed using combinations of keywords such as “Fintech,” “Financial Technology,” “digital finance” and the names of Southeast Asian countries (e.g., Indonesia, Malaysia, Singapore, Thailand, Vietnam, Philippines, Brunei, Cambodia, Laos, Myanmar, Timor-Leste) in titles, abstracts, and keywords. The time span was not restricted to allow for historical and contemporary insights. After filtering for relevance, document type (articles, conference papers, reviews), and language (English), a final dataset was compiled for further analysis.

To visualize the bibliometric networks, the study used VOSviewer, a specialized software tool for constructing and displaying bibliometric maps based on co-authorship, keyword co-occurrence, citation, and bibliographic coupling. The data were exported from Scopus in CSV format and processed in VOSviewer to generate network maps that illustrate collaboration among authors, institutions, and countries, as well as thematic clusters through keyword analysis. The co-occurrence analysis of keywords helped identify emerging and dominant topics, while the co-authorship and citation analysis revealed patterns of scholarly collaboration and influence.

### 3. RESULTS AND DISCUSSION

#### *Keyword Co-Occurrence Network Analysis*



**Figure 1. Network Visualization**

**Source: Data Analysis**

Figure 1 illustrates the keyword co-occurrence network within the domain of

Fintech research in Southeast Asia. Each node in the map represents a keyword extracted from the literature, with the size of the node reflecting the frequency of the term's occurrence, and the lines (edges) indicating co-occurrence relationships between keywords. Clusters of keywords are colored to denote thematic groupings, which help reveal the major conceptual structures within the Fintech research landscape. The term “fintech” appears as the most dominant and central keyword, suggesting its foundational role in the field.

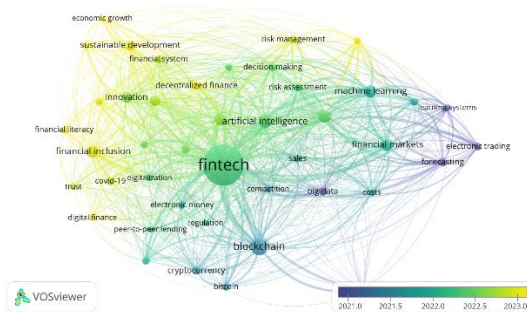
The red cluster centers around themes related to financial inclusion, innovation, digital finance, and sustainable development. This cluster reflects a strong emphasis on the social and developmental implications of Fintech, including its role in promoting access to finance, addressing inequality, and facilitating digital transformation, particularly in emerging economies. Topics such as financial literacy, trust, and COVID-19 digitalization indicate a focus on how Fintech solutions are being adopted in response to broader societal shifts and challenges. This cluster highlights the developmental and policy-oriented strand of Fintech research, relevant to Southeast Asia's diverse and underserved populations.

The green cluster represents a technologically oriented stream, emphasizing machine learning, forecasting, big data, and financial markets. The strong interconnections in this cluster suggest that Fintech research in the region is also advancing in data-driven decision-making and predictive analytics. Keywords like electronic trading, learning systems, and costs indicate a growing interest in how artificial intelligence and data science tools are being integrated into financial operations and market behaviors. This cluster signifies the rise of intelligent systems in Fintech, enabling more efficient, personalized, and automated financial services.

The yellow cluster is anchored by keywords such as blockchain, cryptocurrency, regulation, and peer-to-peer lending, indicating a strong thematic focus on decentralized finance (DeFi) and emerging

financial instruments. Terms like bitcoin, electronic money, and crypto reflect growing scholarly attention toward the disruptive potential of blockchain technologies in reshaping traditional finance. Regulatory issues also appear here, suggesting ongoing discourse around governance, compliance, and policy in the evolving digital asset landscape. This cluster is particularly relevant in Southeast Asia, where countries are navigating complex regulatory responses to digital currencies and DeFi innovations.

The blue cluster groups concepts related to risk management, decision making, artificial intelligence, and competition. This indicates a conceptual space concerned with the strategic and operational dimensions of Fintech implementation. The positioning of artificial intelligence as a bridge across clusters shows its integrative role across risk analytics, automation, and competitive advantage. The presence of sales and competition points to studies focusing on Fintech business strategies and market behavior. This cluster captures the intersection of innovation and risk—key concerns for Fintech firms, regulators, and investors alike.

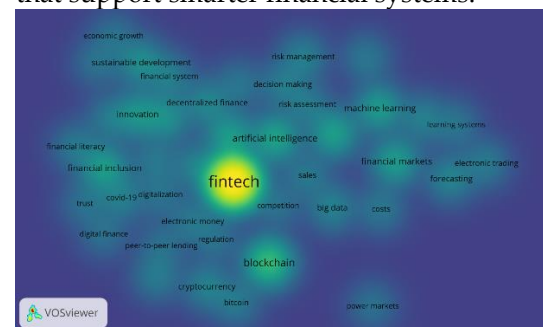


### Figure 2. Overlay Visualization

**Source: Data Analysis**

Figure 2 presents a temporal evolution of Fintech-related research themes in Southeast Asia based on average publication year. Keywords are color-coded on a gradient from dark blue (earlier years, ~2021) to yellow (more recent years, ~2023). This visualization enables insight into how scholarly focus has shifted over time. For example, terms like blockchain, cryptocurrency, big data, and electronic trading appear in blue, indicating that they were dominant in earlier publications,

possibly reflecting the initial excitement around disruptive technologies and market infrastructure. In contrast, keywords shaded in green to yellow, such as artificial intelligence, sustainable development, financial inclusion, and risk management, represent more recently emerging topics in the literature. This transition suggests a growing emphasis on how Fintech can be harnessed for broader socio-economic impact, such as addressing development goals, enhancing trust, managing risks, and enabling financial access. Additionally, the appearance of COVID-19 digitalization and decentralized finance in the yellow spectrum indicates an acceleration of Fintech innovation during and post-pandemic, reflecting the sector's adaptive response to crisis-driven digital acceleration. Moreover, the emergence of machine learning, forecasting, and learning systems in green and blue-green zones indicates a sustained yet growing interest in data-driven technologies that support smarter financial systems.



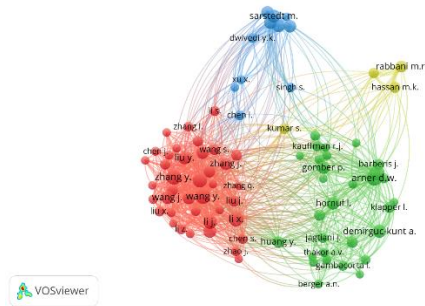
### Figure 3. Density Visualization

**Source: Data Analysis**

Figure 3 illustrates the intensity of keyword occurrences in Fintech-related research across Southeast Asia. The brighter and warmer areas, particularly the yellow hotspot around “fintech”, signify the highest frequency and centrality of that keyword in the analyzed publications. Surrounding terms like financial inclusion, artificial intelligence, blockchain, innovation, and machine learning also appear in green to light green, indicating their prominence and relevance as central topics within the literature. These themes represent the core conceptual framework of Fintech research in the region, combining technological, social, and institutional perspectives. In contrast, the cooler areas in

blue and purple (e.g., bitcoin, power markets, costs, learning systems) reflect lower keyword density, suggesting that these themes are either emerging, niche, or underexplored. Notably, topics like COVID-19 digitalization, decentralized finance, and financial literacy exhibit moderate intensity, implying a growing but not yet dominant focus in the scholarly discourse.

#### *Co-Authorship Network Analysis*



**Figure 4. Author Visualization**

**Source: Data Analysis**

Figure 4 highlights clusters of influential authors in Fintech research, indicating collaborative patterns and intellectual communities. Each node represents an author, and the size of the node corresponds to their publication volume or citation impact. The red cluster, prominently featuring authors like Zhang J., Wang Y., and Liu Y., suggests a dense collaboration network likely based in East Asia, characterized by close intra-regional co-authorship. The green cluster includes globally recognized scholars such as Kauffman R.J., Gomber P., and Arner D.W., indicating a strong focus on regulatory frameworks and digital finance. The blue cluster, with figures like Sarstedt M. and Dwivedi Y.K., likely emphasizes methodological rigor and digital adoption studies. The smaller yellow cluster, led by Rabbani M.R. and Hassan M.K., suggests emerging scholarship with growing influence, possibly focused on Islamic finance or Fintech inclusion.

#### **DISCUSSION**

The findings of this bibliometric analysis provide a multidimensional view of the evolution, structure, and direction of Fintech research in Southeast Asia. Through co-occurrence analysis, overlay visualization,

heatmaps, co-authorship, and country collaboration networks, this study highlights both the intellectual core and emerging frontiers within the field. The visualization outputs from VOSviewer underscore the complexity and interdisciplinary nature of Fintech, which sits at the nexus of technology, finance, economics, development, and policy.

The keyword co-occurrence network identifies five prominent thematic clusters. The central and most dominant cluster revolves around “fintech,” closely linked with keywords such as financial inclusion, digital finance, COVID-19 digitalization, and sustainable development. This cluster reflects the growing recognition of Fintech as a tool for inclusive economic development in the region. Southeast Asia, with its substantial unbanked population, has witnessed a surge of interest in how Fintech can bridge financial gaps, especially in countries like Indonesia, the Philippines, and Vietnam. Fintech-enabled services such as mobile wallets, peer-to-peer lending, and micro-investments are increasingly being viewed as effective mechanisms for enhancing financial access and literacy.

Adjacent to this, the second cluster focuses on technological foundations, particularly machine learning, artificial intelligence, big data, and risk management. These keywords represent the technological architecture supporting Fintech applications in areas such as fraud detection, credit scoring, and automated trading. The integration of advanced analytics and predictive modeling into financial platforms aligns with global Fintech trends, but also reflects a regional need to optimize services for diverse, often underserved markets. Southeast Asian researchers are increasingly exploring how machine learning can be localized to handle heterogeneous data sources, language diversity, and informal economies.

The third cluster, rich in terms like blockchain, cryptocurrency, bitcoin, and decentralized finance, showcases the growing academic attention toward Web3 innovations and their financial applications. While adoption rates vary significantly among



Southeast Asian countries, with Singapore leading in regulatory sandboxing and digital asset exchanges, academic discourse around blockchain remains vibrant. Researchers have examined the implications of decentralized finance (DeFi) for bypassing traditional banking systems, as well as the regulatory concerns that arise in managing the volatility and anonymity of cryptocurrencies. These findings demonstrate the tension between innovation and regulation, a recurring theme in the region's Fintech landscape.

The fourth cluster deals with risk and decision-making processes, which include keywords like risk assessment, competition, and forecasting. This indicates an underlying concern among scholars about the sustainability and reliability of Fintech models, particularly in volatile markets. As Southeast Asian nations continue to digitalize their economies, researchers are analyzing risk frameworks to ensure resilience against cyber threats, systemic risks, and market bubbles. Moreover, the proliferation of Fintech startups has introduced intense competition, pushing firms to innovate while maintaining regulatory compliance and operational efficiency.

The final cluster addresses economic development and systemic transformation, reflected in keywords like economic growth, financial system, trust, and regulation. These terms suggest a broader institutional and policy-level analysis of Fintech's role in transforming traditional financial infrastructures. For example, countries like Malaysia and Thailand have issued comprehensive Fintech roadmaps to guide innovation in alignment with national development goals. Researchers have begun to explore the institutional readiness of Southeast Asian governments to manage Fintech-led disruptions, focusing on interoperability, cross-border data sharing, and consumer protection.

The temporal overlay visualization provides further insights into the evolution of research themes over time. Earlier research (2021 and before) was largely concerned with foundational technologies and concepts such as blockchain, big data, and cryptocurrency,

reflecting a wave of technological enthusiasm and exploratory studies. In contrast, more recent studies (2022–2023) have shifted toward value-oriented and application-driven topics, such as financial inclusion, sustainable development, and COVID-19 digitalization. This shift mirrors real-world developments, including the pandemic-induced acceleration of digital adoption, the rise of impact-oriented Fintech models, and increased government attention on digital financial literacy.

The heatmap visualization complements these findings by pinpointing the intensity and concentration of research themes. The “fintech” keyword forms the central hotspot, unsurprisingly dominating the thematic landscape. High-density zones around financial inclusion, blockchain, and artificial intelligence indicate these as key areas of interest and publication activity. Conversely, cooler zones such as bitcoin, learning systems, and power markets suggest emerging or underexplored territories. This disparity opens avenues for future research, particularly in assessing the role of Fintech in energy markets, ESG financing, or AI-driven adaptive learning in finance.

The co-authorship network reveals important insights about intellectual collaboration and authorship clusters. The largest and densest cluster features authors of East Asian origin (e.g., Zhang J., Liu Y., Wang Y.), whose contributions primarily relate to technological and data-driven Fintech studies. Another key cluster includes prominent Western scholars such as Kauffman R.J., Gomber P., and Arner D.W., known for work in regulation, policy, and global Fintech trends. Southeast Asia's Fintech research appears to benefit from cross-regional academic collaboration, though many high-impact publications still emerge from outside the region. This suggests a need for capacity building among local researchers and institutions, including cross-border academic partnerships and increased investment in digital research infrastructure.

From a policy and development standpoint, the findings underscore that Fintech in Southeast Asia is at a critical

inflection point. The region has successfully embraced digital innovation, but challenges remain in ensuring equitable access, data protection, and financial stability. Research increasingly advocates for evidence-based regulation that balances innovation with consumer and systemic safeguards. The bibliometric trends support this by highlighting growing scholarly concern for regulation, risk assessment, and financial inclusion, suggesting that future research will continue to influence policy discourse.

This study provides a strategic roadmap for future Fintech research in Southeast Asia. There is a clear need to explore the intersection of Fintech with sustainability, especially in areas like green financing, carbon credit markets, and digital solutions for micro-entrepreneurs. In addition, localized studies focusing on indigenous communities, rural financial needs, and gendered access to digital finance can enrich the inclusivity of the research agenda. The integration of real-time data analytics, AI ethics, and cybersecurity into Fintech research is another promising

direction, particularly as Southeast Asia's digital economy matures.

#### 4. CONCLUSION

Based on the bibliometric analysis and VOSviewer visualizations, this study concludes that Fintech research in Southeast Asia has evolved into a dynamic and multidimensional field, characterized by strong thematic clusters around financial inclusion, digital innovation, machine learning, blockchain, and regulatory frameworks. The temporal and density-based visualizations reveal a clear shift from foundational technologies to application-oriented and inclusive development themes, especially in response to COVID-19 and digital transformation agendas. However, disparities in research output and institutional collaboration remain across countries in the region, signaling the need for more inclusive academic engagement and localized research.

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