



The impact of FinTech on bank performance: A systematic literature review

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ARTICLE INFO

Keywords:

FinTech
Bank performance
Bibliometric analysis
Digital banking
Financial inclusion
Peer-to-peer lending
Risk management
Mobile payments
Blockchain
Customer experience
Regulatory frameworks
Financial stability

ABSTRACT

This paper investigates the impact of financial technology (FinTech) on bank performance through a comprehensive bibliometric analysis of publications from the Web of Science Core Collection Database published between 2015 and July 2024. The study employs the R-package litsearchr for keyword search string development and uses VosViewer and Bibliometrix for science mapping and network analysis. The research addresses five key questions, including research trends, influential authors and sources, geographical influences, notable research clusters, and the aspects of bank performance affected by FinTech. The paper proposes four future research directions, suggesting the exploration of alternative bank performance metrics, greater regional focus, the investigation of emerging themes such as financial inclusion and the role of entrepreneurship, and advances in methodologies. This article contributes to significantly enhancing the understanding of how FinTech is reshaping the banking industry and providing a robust foundation for future research to build upon, making it a valuable resource for both academics and practitioners interested in the intersection of technology and finance.

1. Introduction

The rapid advancement of financial technology (FinTech) has fundamentally reshaped the global banking sector by introducing novel business models, enhancing operational efficiency, and redefining customer interactions (Lee & Shin, 2018). Innovations such as blockchain transactions, artificial intelligence-driven risk assessment, digital banking, and mobile payment platforms have disrupted traditional financial institutions, altering their profitability, risk exposure, and market stability (King, Lopes, Srivastav, & Williams, 2021). While FinTech has expanded financial accessibility and increased competition in the banking industry, its long-term implications for bank performance remain a subject of ongoing academic debate. The aftermath of the 2008 global financial crisis played a crucial role in accelerating these changes, as trust in traditional banking institutions declined and consumers increasingly sought alternative financial solutions (Elsaid, 2023). This shift has led to a growing body of research examining the interplay between FinTech and bank performance, yet many questions remain unanswered.

While numerous studies have explored FinTech's impact on banking operations, the literature remains fragmented, with varying methodologies and divergent conclusions. Existing research has primarily focused on isolated aspects such as financial inclusion (Hakimi, Boussaada, &

Karmani, 2022), cost efficiency (Lv & Xiong, 2022), peer-to-peer lending (Dawood, Liew, & Rajan, 2023), and regulatory challenges (Anagnostopoulos, 2018), often neglecting a holistic perspective that synthesizes these dimensions into a comprehensive framework. Furthermore, regional disparities in FinTech adoption, driven by regulatory environments and market conditions, highlight the need for a more nuanced analysis that accounts for cross-country variations. Despite the presence of some literature reviews on this topic, the rapidly expanding body of research necessitates an up-to-date, systematic bibliometric analysis that can map the intellectual structure of the field, identify key thematic clusters, and highlight emerging trends (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). To bridge this research gap, the present study conducts a comprehensive bibliometric and thematic review of research on FinTech's influence on bank performance, analyzing publications from the Web of Science Core Collection Database spanning from 2015 to July 2024. Using the R-package litsearchr, we develop a structured keyword search strategy that incorporates terms overlooked in previous literature reviews, ensuring a more inclusive and representative dataset. Additionally, VosViewer and Bibliometrix are utilized to perform science mapping and network analysis, providing a data-driven understanding of research trends, scholarly impact, and thematic evolution in the FinTech-banking nexus.

This study makes several innovative contributions to the

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understanding of FinTech's impact on bank performance, addressing critical gaps in the existing literature. Unlike previous reviews that focus on narrow aspects of FinTech's influence on banking, this study provides a comprehensive and systematic bibliometric and thematic analysis, offering a structured and data-driven mapping of key research areas, interconnections, and emerging trends. By integrating quantitative bibliometric techniques with qualitative synthesis, it bridges the gap between systematic literature reviews and empirical research, providing a holistic perspective on how FinTech affects efficiency, profitability, risk management, stability, and competition dynamics. Through science mapping and network analysis, this study identifies emerging yet underexplored research areas, such as the intersection of FinTech and financial inclusion in emerging economies, the role of AI and blockchain-driven banking models, and the need for alternative bank performance metrics beyond traditional profitability indicators, such as cybersecurity resilience and regulatory compliance efficiency. Additionally, by incorporating a global perspective, the study highlights regional disparities in FinTech adoption and banking integration, emphasizing how regulatory frameworks, technological infrastructure, and market maturity shape FinTech's impact across different financial ecosystems. These findings hold significant practical implications for policymakers, industry leaders, and researchers, offering insights into regulatory frameworks that balance innovation with financial stability, strategic adaptations for traditional banks facing competition from FinTech firms, and future research agendas that address unexplored methodological gaps and encourage interdisciplinary collaboration. By synthesizing existing knowledge while setting a forward-looking research agenda, this study serves as a valuable resource for academics, practitioners, and policymakers navigating the evolving relationship between FinTech and banking.

The remainder of this paper is structured as follows: The next section provides an overview of existing literature reviews on FinTech and banking and outlines the research questions guiding this study. This is followed by the data collection and methodological approach. The subsequent sections present the results of the bibliometric analysis, discuss key findings, and conclude with recommendations for future research.

2. Literature review and research questions

2.1. Unpacking the concepts: Defining FinTech and bank performance

FinTech, short for financial technology, broadly refers to the use of innovative technologies to deliver financial services more efficiently and inclusively (Elsaid, 2021). Within the banking industry, FinTech encompasses a wide range of tools and systems—from AI-powered credit scoring (Boot, Hoffmann, Laeven, & Ratnovski, 2021) and robo-advisory (Gomber, Koch, & Siering, 2017) to blockchain-based payments (Khraisha & Arthur, 2018), mobile banking platforms (Firmansyah, Masri, Anshari, & Besar, 2022) and non-fungible tokens (NFTs) (Barua, Golder, Chowdhury, & Sharmeen, 2025). These technologies not only transform traditional service delivery but also reconfigure back-end operations, risk management practices, and customer interactions (Lee & Shin, 2018; Lee, Wang, & Ho, 2020). The growth of FinTech equity funding globally reflects this transformation, with venture capital investments playing a key role in fostering innovation and startup development in the sector (Golder, Barua, Abedin, Adu, & Ren, 2024). Studies show that factors such as economic development, regulatory environments, communication technology infrastructure, and globalization significantly influence FinTech equity funding flows and deals worldwide (Golder et al., 2024). However, FinTech should not be understood as a monolithic phenomenon. Its impact is best evaluated through the lens of specific banking service domains, such as payments, lending, investment advisory, deposits, compliance, and customer relationship management (Thakor, 2020). Each domain interacts differently with FinTech innovations and, in turn, affects distinct dimensions of bank

performance.

In the realm of banking, performance is often defined as the ability of a bank to achieve sustainable growth, profitability, and a competitive position within the financial market. In this study, we adopt the framework proposed by Mithas, Ramasubbu, and Sambamurthy (2011), as referenced by Hanafizadeh, Shafia, and Bohlin (2021), which conceptualizes firm performance as a multidimensional construct. We apply this framework to analyze bank performance in the digital era, offering a comprehensive approach to understanding how FinTech impacts various aspects of bank operations. According to Mithas et al. (2011), performance can be broken down into four critical dimensions: 1) Operational effectiveness: for banks, this encompasses the efficiency with which services are delivered, including transaction processing speed, cost efficiency (e.g., through automation), and adaptability to changing market conditions. With FinTech innovations such as blockchain, AI, and machine learning, banks can improve their time to market for new products, enhance their operational flexibility, and reduce the cost-to-income ratio; 2) Customer-focused performance: in banking, customer performance can be measured by customer satisfaction, retention rates, and service quality. FinTech applications—such as mobile banking apps, robo-advisors, and personalized financial products—can significantly enhance customer experience by offering more personalized and accessible services, ultimately driving customer loyalty and satisfaction; 3) Human resource performance: just as in firms, a bank's ability to perform also relies on the satisfaction and engagement of its employees. This includes employee satisfaction, training programs, and employee productivity, particularly as FinTech tools may automate routine tasks, enabling employees to focus on higher-value activities. Furthermore, the development and implementation of digital skills training for employees in the face of technological advances can lead to improved employee morale and higher retention rates; and 4) Financial performance: finally, financial performance remains a crucial aspect of evaluating a bank's success. This includes traditional measures such as revenue growth, profit margins, return on investment (ROI), and market position. With the advent of FinTech, banks can achieve higher profitability through cost savings, expanded revenue streams from digital services, and reduced operational risks via more robust data analytics and fraud detection systems. By incorporating these four dimensions, we can provide a more comprehensive and integrated framework to evaluate bank performance in the context of FinTech, which not only focuses on financial outcomes but also accounts for customer satisfaction, internal efficiency, and employee engagement. This holistic perspective is particularly relevant in the modern banking landscape, where digital transformation plays a critical role in reshaping both tangible and intangible performance metrics.

2.2. Building the theoretical framework: Connecting FinTech and bank performance

The impact of FinTech on bank performance can be analyzed through several key theoretical frameworks that explain the mechanisms of technological disruption, competition, financial intermediation, and regulatory adaptation. Disruptive Innovation Theory (Christensen, 2013) highlights the competitive dynamics between FinTech firms and traditional banks, emphasizing how digital banking models, mobile payments, and peer-to-peer lending platforms challenge incumbent financial institutions by offering cheaper, faster, and more accessible financial services. FinTech solutions, such as digital lending platforms and blockchain-based financing, have transformed SME financing by reducing dependency on traditional banking channels. Rehman et al. (2023) find that FinTech adoption among manufacturing SMEs significantly influences their access to bank credit, reshaping bank-SME relationships and introducing new risk assessment mechanisms. At the same time, Financial Intermediation Theory (Diamond, 1984) provides insight into how FinTech is transforming the role of banks as financial intermediaries, influencing lending behaviors, investment channels, and

transaction efficiency. The rise of alternative financing mechanisms, such as digital lending platforms and decentralized finance (DeFi), has altered traditional banking functions, prompting both competitive responses and strategic collaborations between banks and FinTech firms. While digital transformation is widely regarded as a driver of operational efficiency and innovation in banking, its impact on firm performance can be complex and sometimes counterintuitive. Shehadeh et al. (2024) argue that digital transformation does not always lead to uniform performance gains, as factors such as organizational adaptability, leadership, and workforce demographics—including gender dynamics—play a critical role in determining its success. Finally, Regulatory Arbitrage Theory (Lumpkin, 2010) explains how FinTech firms exploit variations in global regulatory environments, enabling them to innovate more freely in jurisdictions with relaxed financial oversight while facing stricter compliance in highly regulated markets. These differences in regulatory approaches create regional disparities in FinTech adoption, affecting financial stability, consumer protection, and market competition. The increasing integration of FinTech in banking operations has raised concerns about governance structures, particularly regarding transparency and disclosure requirements. Shehadeh et al. (2024) examine how corporate governance mechanisms shape FinTech disclosure practices in both conventional and Islamic banks, highlighting the role of regulatory compliance and institutional differences in FinTech adoption. Together, these theories offer a multi-dimensional framework for understanding how FinTech's evolution is shaping the banking industry, reinforcing the need for adaptive regulatory frameworks and strategic responses from traditional financial institutions.

2.3. A review of key literature: How FinTech is shaping bank performance

In recent years, there has been a growing body of literature examining the role of FinTech in transforming the banking industry. A number of significant reviews have provided valuable insights into this rapidly evolving field. However, despite the progress, several gaps remain in understanding the full impact of FinTech on bank performance and the broader financial ecosystem.

Milian, Spinola, and Carvalho (2019) reviewed 179 publications from 1980 to 2018, categorizing the research into sectors such as financial services, innovation, operational services, and financial technology. Their study underscores the critical importance of examining the effects of digital transformation on financial intermediaries. However, this study relies heavily on quantitative metrics such as citation counts, which might overlook the qualitative evolution of FinTech innovations. Liu, Li, and Wang (2020) conducted a bibliometric analysis and systematic literature review of publications on FinTech business models in the fields of economics, finance, and management, utilizing the Web of Science (WoS) Core Collection database. Following the methodology outlined by Budgen and Brereton (2006), they recommended that future research should explore the impact of crowdfunding on the banking system and the competitive dynamics among crowdfunding platforms. However, the lack of an in-depth evaluation of methodological biases in the studies included in their review limits the study's ability to generalize findings across different regions. Li and Xu (2022) performed a comprehensive bibliometric analysis of publications related to financial innovation, identifying three peaks in publication activity in 2009, 2015, and 2019. Their findings indicate a strong correlation between financial innovation, banking, and financial crises, highlighting the necessity of investigating the impact of financial innovation within the banking industry. Similarly, Joshi (2023) conducted a bibliometric analysis focusing on FinTech innovation, examining publications from 2017 to 2022, and concluded that a key challenge for future research lies in understanding the impact of disruptive FinTech innovations on the banking sector. The disadvantage side of these two studies are that their investigation over covers a short period, excluding a broader historical context that could offer insights into the evolution of FinTech over the last decade. Building on these

foundational studies, our research aims to further complement the existing literature by providing a detailed analysis of how FinTech influences bank performance, thereby addressing an important gap in the current understanding of this topic.

As the body of literature on FinTech continues to grow, several studies have emerged that aim to elucidate the relationship between FinTech and the banking sector. Thakor (2020) conducted a review focusing on the interaction between FinTech and banking, with particular emphasis on P2P lending, cryptocurrencies, and smart contracts. Through content analysis, Thakor concludes that while FinTech applications are likely to capture significant market share from traditional banks, they are unlikely to completely replace them. However, the focus on specific FinTech sectors such as P2P lending and cryptocurrencies neglects other transformative areas like open banking or RegTech that are rapidly changing the dynamics of the banking industry. Elsaid (2023) provided a theoretical review of key articles in the FinTech and banking domain, examining the impact of FinTech firms on the banking industry and proposing a future research agenda. The study underscores the importance of analyzing how competition between FinTech firms and traditional banks influences the stability of the financial system. Elia, Stefanelli, and Ferilli (2022) reviewed 377 articles indexed in Scopus from 2014 to 2021, using the search terms “FinTech” and “bank.” Their analysis identified six dimensions of FinTech's impact on banks: industry, business model, society, customer, the lending process for small and medium enterprises (SMEs), and the level of innovation in financial services. The review is limited by its narrow focus on theoretical perspectives, neglecting the importance of empirical studies that provide tangible insights into how FinTech applications are reshaping banking practices on the ground. In another study, Chen and Peng (2020) conducted a systematic literature review using the keywords “financial innovation” and “bank” and found mixed results regarding the relationship between financial innovation and bank performance. They further employed FinTech news related to banks, R&D expenditure, and financial patents as proxies for financial innovation to test this relationship using a panel regression model. Their findings suggest that high R&D expenditure and an increasing number of FinTech-related news stories are associated with lower bank profitability and increased liquidity risk. Elia et al. (2022) reviewed 377 articles indexed in Scopus from 2014 to 2021, examining six key dimensions of FinTech's impact on banks: industry, business model, society, customer, SME lending, and innovation. While the breadth of their analysis is commendable, the cultural and regional diversity are not been considered.

The rapid growth of studies examining FinTech's impact on banking performance, particularly in areas such as efficiency, risk management, financial inclusion, and competition dynamics. The increasing use of quantitative and empirical methods, such as econometric modeling, machine learning, and network analysis, to assess FinTech's influence on traditional banking institutions. A growing emphasis on regional differences, with research highlighting varying regulatory approaches, market maturity levels, and adoption rates across different financial ecosystems. The literature on FinTech and banking is rich and diverse, but a closer examination reveals several methodological gaps and regional inconsistencies that limit the ability to generalize findings across different contexts. While the studies reviewed offer valuable insights, there is a need for a more critical and nuanced approach that addresses these gaps, particularly in terms of geographical diversity, methodological rigor, and thematic overlap. Our study aims to address these limitations by providing a comprehensive analysis that combines bibliometric methods with thematic synthesis to offer a more holistic understanding of how FinTech is impacting bank performance, particularly across different regions and financial contexts.

The research is guided by the following research questions:

RQ1. What are the research trends regarding the impact of FinTech on bank performance?

RQ2. Who are the most influential authors and sources in this field?

RQ3. How do cultural and geographical factors influence the

adoption and impact of FinTech on bank performance across different regions or countries?

RQ4. Are there notable clusters or groupings of research within the field of FinTech and bank performance, and what are the characteristics of these clusters?

RQ5. Which aspects of bank performance are affected by FinTech in various studies, how are they measured, and are there common metrics or indicators used?

To the best of our knowledge, this study is to first to use the most detailed keywords related to both FinTech and bank with the help of R package litsearchr and filtered the articles to get the results related to the research aim. Aiming at addressing the research questions, this study can give inspiration of the research trend and emerging issues. By conducting a systematic, bibliometric and thematic review, this study maps the intellectual structure of FinTech research in banking, providing a data-driven synthesis of existing knowledge. This review identifies emerging themes, citation trends, and research clusters, helping scholars and practitioners navigate the rapidly evolving field. Unlike previous studies, this research bridges the gap between systematic literature reviews and empirical studies, offering both a quantitative bibliometric analysis and a qualitative thematic synthesis. By highlighting unexplored areas and future research directions, this study serves as a foundation for further inquiry into FinTech's transformative impact on the global banking sector.

3. Data and methodology

This study aims to investigate the impact of FinTech on the bank performance and raise five research questions. To addressing the research questions, the present study uses a systematic literature review (SLR) methodology, which is designed to yield visible, objective, and repeatable review process findings (Papaioannou, Sutton, Carroll, Booth, & Wong, 2010; Snyder, 2019). SLR has firstly been developed and further heavily applied in the medical sciences area; nevertheless, the business research has witnessed a growing usage of SLR method (Ramsawak, Buerter, Maheshwari, Dang, & Thanh Phan, 2023; Snyder, 2019). This study employs the methods of bibliometric review include locating the publication, citation and author analysis to figure out the research trend and the most impacting articles and institutions (Ramsawak et al., 2023). Bibliometric analysis is firstly explained in the 1950s, which relies on the application of quantitative techniques and qualitative interpretation and is typically employed when the scope of review is vast (Donthu et al., 2021). The advantage of bibliometric analysis is to arrive at a consistent and standardized set of indicators and thus mitigate the bias (Wallin, 2005). According to the summary of Donthu et al. (2021), bibliometric review techniques toolbox encapsulates performance analysis (e.g. publication related and citation related metrics), science mapping (e.g. co-authorship, bibliographic coupling and co-citation analysis), and network analysis (e.g. clustering and visualization).

The methodological approach applied in this study is showed in Fig. 1. In the initial stage, we look through the previous literature and review articles in order to discover the research gap and develop our research questions. The summary of the reviewed article related to Fintech and banks is listed in Table 1.

Following Elsaid (2023), Thakor (2020), and Thomas, Mendiratta, and Kashiramka (2023), in this study FinTech is defined as “technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions, and the provision of financial services” (Financial Stability Board, 2017, p.1). Bank performance involves accounting and financial indicators like profitability (Nguyen, Tran, & Ho, 2021; Phan, Narayan, Rahman, & Hutabarat, 2020) and efficiency (Lee, Li, Yu, & Zhao, 2021; Ngo & Le, 2019). Other issues, like credit risk (Cheng & Qu, 2020; Li, He, Tian, Sun, & Ning, 2022), liquidity (Guo & Zhang, 2023; Zhao, Li, Yu, Chen, & Lee, 2022) and share price

(Li, Spigt, & Swinkels, 2017) can also be included.

In the second stage, we constructed the search string based on the conceptualization of the theme and previous systematic review articles. Furthermore, the litsearchr software package (Grames, Stillman, Tingley, & Elphick, 2019) was utilized to refine the search string and generate a more reliable and comprehensive keyword list. Litsearchr was chosen over traditional manual keyword selection because it applies text-mining algorithms and bibliometric analysis to systematically identify and rank relevant terms, thereby minimizing researcher bias and enhancing the reproducibility of the search strategy. Compared to conventional search methods, litsearchr ensures that the search query captures a broader and more representative set of literature while also improving precision by eliminating redundant or irrelevant keywords. This approach aligns with best practices in systematic literature reviews, making it particularly valuable for studies that require an extensive, data-driven exploration of evolving research landscapes. Moreover, our search string construction method is superior to conventional keyword selection approaches, as it is built upon a multi-stage process that incorporates both expert knowledge and algorithmic refinement. Instead of relying solely on predefined keywords from previous studies, our approach integrates systematic text mining and co-word analysis, ensuring that emerging terminologies and evolving research trends are also captured. This reduces the risk of missing relevant studies and enhances the coverage and accuracy of the literature retrieval process. As a result, our research string and search methodology offer a more robust, comprehensive, and methodologically sound approach for systematically analyzing the impact of FinTech on bank performance. The final search string is: TS¹ = (“financial performance of bank” OR “bank” OR “performance of financial institution”) AND TS = (fintech OR “financial technolog” OR “digital financ” OR “digital bank” OR “internet financ” OR “internet bank” OR “online financ” OR “online bank” OR “mobile financ” OR “mobile wallet” OR “electronic financ” OR “regtech” OR “wealthtech” OR “insurtech” OR “financial inclusion” OR “cryptocurrenc” OR “blockchain” OR “P2P Lending” OR “peer to peer lending” OR “shadow bank”). (See Table 2)

In the third stage of our methodology, we adopt the four-stage framework outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to conduct a systematic literature review (SLR). While several approaches exist for conducting literature reviews—such as scoping reviews, narrative reviews, and meta-analyses—PRISMA offers distinct advantages in ensuring transparency, replicability, and methodological rigor. Unlike narrative reviews, which often lack standardized procedures, or scoping reviews, which are more exploratory in nature, PRISMA provides a structured, evidence-based protocol for systematically identifying, screening, and selecting studies aligned with defined research objectives (Moher et al., 2009; Page et al., 2021). The PRISMA process comprises four critical stages: Identification, where relevant studies are located through databases and search criteria; Screening, involving the application of inclusion and exclusion criteria to filter studies; Eligibility, during which full-text articles are reviewed for alignment with the research objectives; and Inclusion, where studies meeting the final criteria are synthesized for analysis. This framework ensures a high degree of methodological robustness and contributes to the production of replicable and reliable review outcomes. We chose PRISMA specifically because our objective is not merely to map the existing literature but to synthesize findings relevant to defined research questions in a reproducible and auditable manner. The framework's emphasis on transparent reporting and detailed documentation strengthens the reliability of our review process and allows future researchers to replicate or update the findings. Given the growing volume and diversity of FinTech-related research, PRISMA's structured methodology ensures both

¹ TS in the WoS means searches in title, abstract, keyword plus, and author keywords.

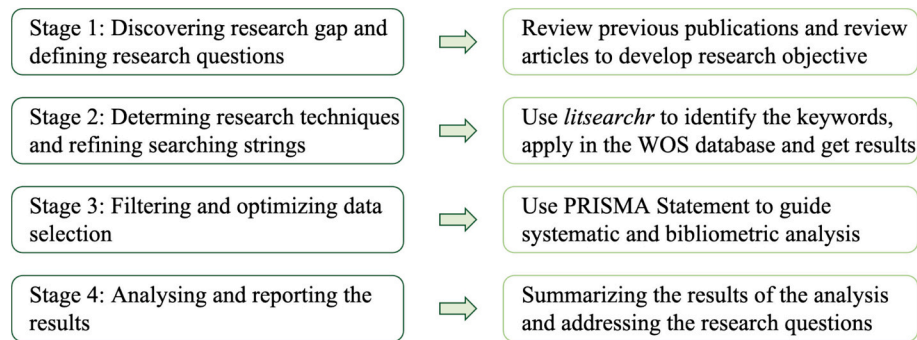


Fig. 1. Methodological approach of this paper.

Table 1
Review of key articles.

Author(s)	Review Theme	Number of articles	Time period	Database	Methodology	Search String
Thakor (2020)	Interaction between fintech and banking	–	–	–	Content analysis	–
Chen and Peng (2020)	Financial innovation and bank performance	98	2005–2018	WoS	Bibliometric analysis & empirical analysis	“Financial innovation” and “bank”
Elia et al. (2022)	Role of Fintech in the banking industry	377	2014–2021	Scopus	Systematic literature review	“Fintech” and “bank”
Murinde, Rizopoulos, and Zachariadis (2022)	Impact of fintech on the functions of banks	–	2003–2020	–	Content analysis and analysis of bank indicators	–
Elsaid (2023)	Impact of fintech firms on banking industry	–	–	Scopus, SSRN and google scholar	Content analysis	“Fintech”, “financial technology”, “crowdfunding”, “P2P lending”, “initial coin offerings”, “cryptocurrency”, “internet banking”, “mobile wallets”, “digital finance” and “digital wallets”
Osei, Cherkasova, and Oware (2023)	The development of digital banking transformation	268	1989–2022	Scopus	A bibliometric review	“digita*” AND “bank” AND “business” AND “model”
Tarawneh, Abdul-Rahman, Mohd Amin, and Ghazali (2024)	Impact of Fintech on the banking profitability	28	2019–2023	WoS	A systematic review	“Fintech”, “Financial Technology”, “Digital Bank*”, “Digitalization”, “Crowdfunding”, “P2P Lending”, “Peer to Peer Lending”, “Shadow Bank*”, “Online Bank*”, “Mobile Money”, “Mobile Transaction*”, “Payment System*”) AND (“Bank*”, “Financial Institut*”) AND (“Performance”, “Profitability”))
Garg and Kumar (2024)	The intersection of banking, digital technologies, and sustainability	154	2012–2024	Scopus and WoS	Systematic review and bibliometric analysis	“digital”, “artificial intelligence”, “blockchain technology”, “cloud computing”, “mobile wallets”, “process automation” AND “sustainab*”, “triple bottom line”, “TBL” AND “bank”
Maniam (2024)	Determinant of islamic fintech adoption	17	2012–2022	Scopus	A systematic literature review	“Islamic Fintech” “Fintech” “Financial Technology” “Digital” “Mobile” “Blockchain” “Regtech” “Wealthtech” “Financial inclusion” “Cryptocurrency” “Insurtech” AND “Islamic” “Sharia” AND “behavior” “factor” “intention” “acceptance” “adoption” “consumer”

Source(s): Table prepared by author.

breadth and depth in capturing relevant studies, making it particularly suitable for our review goals.

Fig. 2 illustrates the systematic literature review (SLR) process, conducted in adherence to the PRISMA framework to ensure both transparency and replicability. We followed the search criteria of Asif, Lodhi, Sarwar, & Ashfaq, 2024 and Tarawneh et al., 2024 whose research also applied PRISMA guidance for conducting systematic literature review. The review commenced with the identification of 7624 records sourced from the Web of Science (WoS) database, using the keyword search string established in the second methodological step. These records were subsequently screened based on predefined inclusion criteria, including language (English), document type (articles or review articles), WoS categories (Economics, Business Finance, Business, Management), publication period (2015 to July 2024), and the presence of the keyword “Impact.” This screening process reduced the pool to 1230 records. In the eligibility stage, the full texts of 708 articles

were assessed for relevance, leading to the exclusion of 300 articles based on detailed evaluations of their titles, keywords, and abstracts. Finally, 408 records were included in the quantitative synthesis for further analysis. This rigorous and methodical approach underscores the precision and diligence applied throughout the review process, ensuring the reliability and validity of the study’s findings.

This study utilized a combination of graphical user interface (GUI)-based software, such as VOSviewer, and command-based tools, including the Bibliometrix package in R, to conduct data processing and analysis. VOSviewer, developed by van Eck and Waltman (2010), is a powerful tool designed specifically for creating and visualizing bibliometric networks. Its strength lies in its ability to graphically represent relationships between keywords, authors, and citations, enabling researchers to uncover patterns and connections that might otherwise go unnoticed. This software is particularly well-suited for analyzing large datasets and provides an intuitive interface for generating visual maps,

Table 2
List of keywords for search string.

	LIST OF KEYWORDS
	bank*
OR	financial performance of bank*
OR	performance of financial institution*
AND	fintech
OR	finance technolog*
OR	digital financ*
OR	internet financ*
OR	online financ*
OR	mobile financ*
OR	electronic financ*
OR	regtech
OR	wealthtech
OR	insurtech
OR	financial inclusion
OR	cryptocurrenc*
OR	blockchain
OR	P2P lending
OR	Peer-to-peer lending
OR	Shadow bank*

Source(s): Prepared by Author.

such as keyword co-occurrence networks and co-citation patterns, which offer valuable insights into the intellectual structure and trends within the field of research.

On the other hand, the Bibliometrix package, introduced by [Aria & Cuccurullo, 2017](#), is an R-based tool offering a comprehensive set of functions for bibliometric analysis. Its command-based nature allows for greater flexibility and customization compared to GUI-based software. Bibliometrix facilitates advanced analyses such as descriptive statistics, thematic mapping, and dynamic trend analysis, which are crucial for gaining deeper insights into the evolution and thematic structure of a research domain. Moreover, the integration of Bibliometrix with R

enables researchers to leverage R's powerful data manipulation and visualization capabilities for customized analysis and reporting.

The combined use of VOSviewer and Bibliometrix in this study ensures a thorough and multifaceted bibliometric investigation. VOSviewer was employed to visually explore the relationships among keywords and to identify clusters of topics within the literature, while Bibliometrix allowed for a more granular analysis of trends and themes over time. These tools were instrumental in conducting keyword analysis, keyword co-occurrence analysis, co-author analysis, co-citation analysis, and visualizing the intellectual structure of research on the impact of fintech on bank performance. Their complementary features provided a robust methodological framework for uncovering trends, collaboration networks, and the core thematic areas within the field.

4. Results

Utilizing the litsearchr program, we systematically identified the most appropriate and comprehensive list of keywords for selecting the articles to be reviewed. Following this, we applied the PRISMA guidelines to filter the search results, ultimately obtaining 408 articles pertinent to our research topic: the impact of FinTech on bank performance. Among these, 379 were research articles, and 29 were review articles. In this section, the analysis of the selected articles will be conducted in three distinct ways—publication analysis, citation analysis, and network and cluster analysis—as recommended by the bibliometric analysis guidelines outlined by [Donthu et al. \(2021\)](#).

4.1. Mapping the momentum: Quantifying the rise of FinTech and bank performance research

4.1.1. Publication trend

To address RQ1, [Fig. 3](#) presents the annual publication trends on the

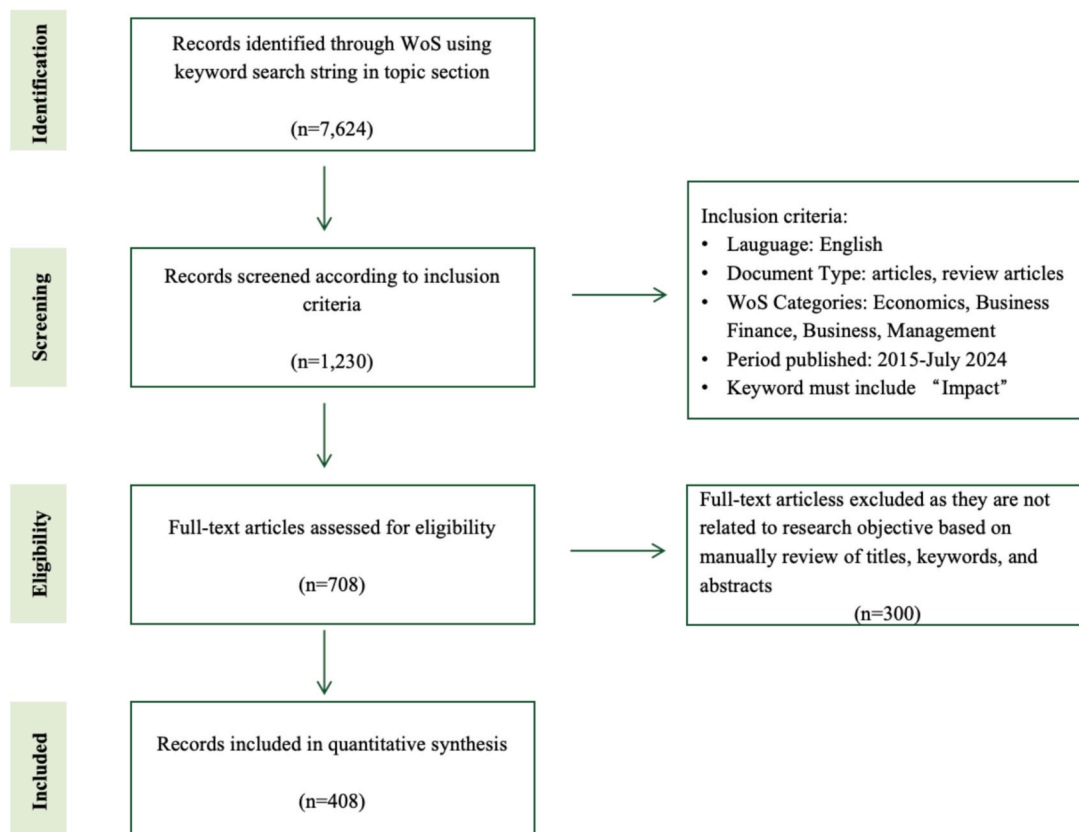


Fig. 2. PRISMA flow diagram showing the paper selection procedure of this article.

impact of FinTech on bank performance. The data highlights several distinct phases in the evolution of academic interest in this topic: (1) *Early Exploratory Phase (2008–2016)*: During this period, the number of publications was minimal, with only one article published in 2008, 2012, and 2016, respectively. These early studies explored specific innovations, including the effects of mobile payments (Au & Kauffman, 2008), m-banking (Shankar, Banwet, & Ketkar, 2012), and internet finance (Hou, Gao, & Wang, 2016) on the banking sector. This limited output suggests that research on FinTech’s impact on bank performance was in its nascent stage, largely driven by isolated advancements in digital finance; (2) *Emerging Growth Phase (2017–2019)*: Academic interest began to accelerate in 2017, with five publications marking the start of a steady growth trend. By 2019, the number of publications increased to 19, indicating a growing recognition of FinTech’s transformative role in banking. This phase reflects the early proliferation of technologies like blockchain (Holotiuk et al., 2019), peer-to-peer lending (Jagtiani & Lemieux, 2019), and digital payment systems (Bunge, 2017), which started gaining traction in the financial services sector. (3) *Rapid Expansion Phase (2020–2023)*: The figure demonstrates an exponential rise in publication activity beginning in 2020, coinciding with the COVID-19 pandemic. The number of articles surged from 35 in 2020 to 64 in 2021, 81 in 2022, and peaking at 129 in 2023. This period reflects a significant shift in research focus, likely driven by the pandemic’s acceleration of digital adoption in financial services. FinTech innovations, such as digital banking platforms (Yao & Song, 2023), AI-driven credit scoring (Liu, Li, & Zheng, 2023), and virtual financial advisors (Dehnert & Schumann, 2022), became critical in ensuring continuity and efficiency in banking operations during the global crisis. The surge in publications also suggests increasing interdisciplinary collaboration to study FinTech’s economic, operational, and strategic implications for banks. (4) *Continued Momentum in 2024 (Projected)*: As of July 2024, 65 publications have already been recorded, indicating sustained academic interest. If the trend continues, the total for 2024 is likely to exceed 100 articles, reaffirming the importance of this topic. The continued momentum highlights a growing body of work examining FinTech’s role in areas such as risk management (Litimi, BenSaïda, & Raheem, 2024), customer experience (Sun & Zhang, 2024), and financial inclusion (Chen, He, & Li, 2024).

Two key events appear to have influenced the trajectory of this research field. First, the 2008 financial crisis seems to have sparked

initial academic interest by highlighting the need for innovation and resilience in the banking sector. Second, the COVID-19 pandemic that began in 2020, with its transformative effects on consumer behavior, digital adoption, and the financial services industry, significantly accelerated research activity in this domain. These external catalysts, combined with the rapid evolution of FinTech technologies, have contributed to the substantial growth in scholarly attention to this topic.

This publication trend demonstrates the increasing relevance of understanding how FinTech innovations impact bank performance and underscores the growing importance of this topic within academic and policy-making circles.

4.1.2. The most productive journals

To address RQ2, we analyzed the 408 articles included in this study, which were published across 196 academic journals, to identify the most influential sources contributing to research on the impact of FinTech on bank performance. Table 3 highlights the top 10 journals with the highest number of publications in this domain, including *Finance Research Letters*, *Research in International Business and Finance*, *Technological Forecasting and Social Change*, *Cogent Business & Management*, and the *International Journal of Bank Marketing*.

These journals represent key contributors to advancing knowledge on how FinTech innovations affect various aspects of banking

Table 3
Top 10 journals publishing articles on impact of FinTech on bank performance.

	Publication Titles	TP	JIF Quartile	Impact factor
1	<i>Finance Research Letters</i>	17	Q1	7.4
2	<i>Research in International Business and Finance</i>	11	Q1	6.3
3	<i>Technological Forecasting and Social Change</i>	11	Q1	12.9
4	<i>Cogent Business Management</i>	10	Q1	6.2
5	<i>International Journal of Bank Marketing</i>	10	Q1	6.3
6	<i>International Review of Financial Analysis</i>	10	Q1	7.5
7	<i>Financial Innovation</i>	9	Q1	6.9
8	<i>Economic Modeling</i>	7	Q1	4.2
9	<i>Risks</i>	7	Q2	2
10	<i>Applied Economics Letters</i>	6	Q3	1.2

Source(s): Prepared by Author.

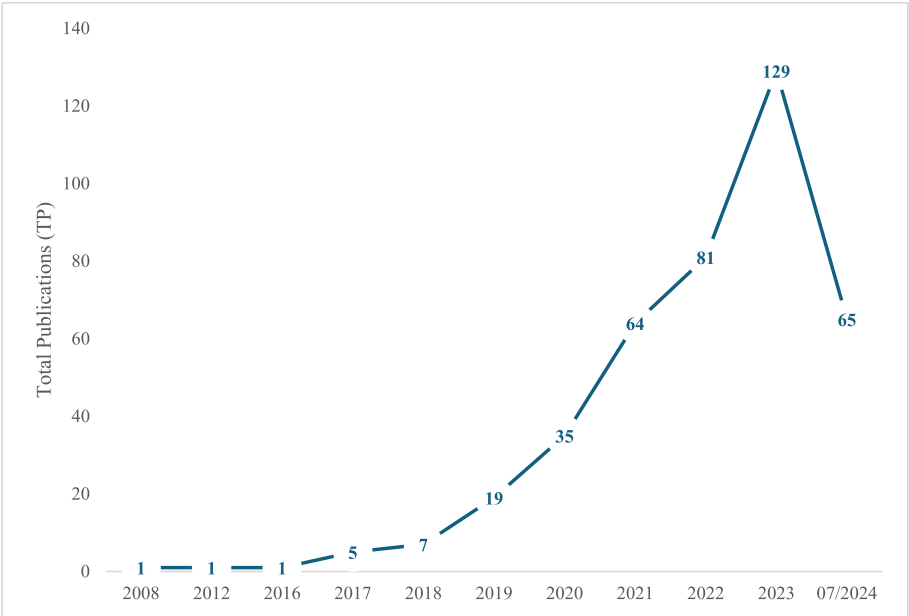


Fig. 3. The publication trend from 2008 to July 2024.

operations, performance metrics, and strategic decision-making. The prominence of Q1-ranked journals with high Journal Impact Factors (JIFs) further emphasizes the quality and significance of research in this area. For instance, *Finance Research Letters* and *Technological Forecasting and Social Change* frequently publish studies on the operational efficiency improvements, risk management innovations, and customer engagement strategies enabled by FinTech. Similarly, the *International Journal of Bank Marketing* has provided substantial insights into how FinTech reshapes customer behavior and satisfaction within the banking industry.

These findings highlight that research on FinTech's impact on bank performance is not only growing in quantity but is also published in academically prestigious journals. This underscores the field's increasing relevance and academic influence, as well as its ability to produce high-quality, impactful studies that inform both theoretical frameworks and practical applications for the banking sector. By addressing critical issues such as FinTech-driven efficiency, financial inclusion, and competitive dynamics in banking, the body of literature contributes significantly to understanding how FinTech transforms traditional banking models and enhances overall performance.

4.1.3. The most productive authors

To address RQ2, we also analyzed the contributions of 1127 authors from the 408 articles included in this review. Among these, the top 20 authors were identified based on their total publications, H-index, institutional affiliations, and countries of origin (See Table 4). These authors have significantly advanced our understanding of the impact of FinTech on bank performance and represent key contributors to this growing field. The authors with the highest number of publications are Cheng, Maoyong from China and Banna, Hasanul from the United Kingdom, each with four articles. Cheng's research, published between 2022 and 2024, focuses on using empirical methods to investigate how FinTech innovations influence the Chinese banking system. His work examines operational efficiency, risk management, and customer adoption within a financial landscape marked by rapid technological change. In contrast, Banna's articles, published from 2020 to 2022, explore FinTech's impact on the Islamic banking sector and ASEAN countries. His studies employ empirical analyses to address topics such as financial inclusion, compliance, and economic development, particularly in emerging markets. The average H-index of the top 20 authors is approximately 16, reflecting a high level of academic influence. Many of their studies are frequently cited, underscoring the relevance and quality of their work. The high citation counts suggest that these researchers are addressing critical questions in the field, such as how FinTech affects bank profitability, operational efficiency, and customer satisfaction. The significant academic impact of their research highlights the field's maturity and the value of its contributions to the understanding of FinTech's role in transforming traditional banking practices.

The institutional affiliations and geographical diversity of these authors further demonstrate the global nature of this research domain. Authors from institutions in China, the United Kingdom, the United States, Malaysia, and India are among the most influential contributors. This distribution highlights how FinTech's impact varies across regions, with particular emphasis on addressing the challenges and opportunities presented in emerging markets. Researchers in countries like China and ASEAN nations have focused on FinTech's role in promoting financial inclusion and innovation while adapting to local regulatory and economic conditions. This regional perspective has enriched the overall understanding of FinTech's influence on banking.

In conclusion, the most influential authors in this field have played a pivotal role in advancing research on the impact of FinTech on bank performance. Their high citation counts, and robust H-indices reflect the maturity of this field and the significant contributions it has made to both theory and practice.

Table 4

Top 20 authors with their TP, H-index, institution and country information.

	Authors	TP	H-index	Institution	Country
1	Cheng, Maoyong	4	7	Xi'an Jiaotong University	China
2	Banna, Hasanul	4	15	Manchester Metropolitan University	United Kingdom
3	Guo, Pin	3	4	Xi'an Jiaotong University	China
4	Popesko, Boris	3	10	Univerzita Tomáše Bati ve Zlíně	Czech Republic
5	Tran, Son	3	10	Viet Nam National University Ho Chi Minh City	Viet Nam
6	AL-Shari, Hussein	3	4	Dr. Babasaheb Ambedkar Marathwada University	India
7	Lokhande, M. A.	3	4	Dr. Babasaheb Ambedkar Marathwada University	India
8	Nguyen, liem	3	12	Viet Nam National University Ho Chi Minh City	Viet Nam
9	Yudaruddin, Rizky	3	13	Universitas Mulawarman	Indonesia
10	Ahmad, Rubi	3	14	Universiti MalayaThe institution will open in a new tab	Malaysia
11	Cappa, Francesco	2	23	Università Campus Bio-Medico di Roma	Italy
12	Solarz, Małgorzata	2	3	Uniwersytet Ekonomiczny we Wrocławiu	Poland
13	Grima, Simon	2	22	L-Università ta' Malta	Malta
14	Hakimi, Abdelaziz	2	12	Université de Jendouba	Tunisia
15	Chiu, yung-ho	2	32	Soochow University, Taipei	China
16	Mogaji, Emmanuel	2	25	Keele University	United Kingdom
17	Rupeika-Apoga, Ramona	2	18	Latvijas Universitāte	Latvia
18	Lu, Zhiqiang	2	5	Ningbo University	China
19	Al-Okaily, Manaf	2	37	Jadara University	Jordan
20	Nguyen, Duc Khuong	2	53	Pôle Léonard De Vinci	France

Source(s): Prepared by Author.

4.1.4. The most productive countries and institutions

In order to answer the RQ3, in this analysis, we examine the geographic and institutional distribution of publications to understand how cultural and geographical factors shape the adoption and impact of FinTech on bank performance. Fig. 4 presents the top 20 countries or regions with the highest number of publications, highlighting substantial variations in academic interest and FinTech adoption across different regions. These variations are influenced by several cultural, regulatory, and market-related factors, which play critical roles in determining how FinTech transforms banking systems.

China leads the field, accounting for 25 % of total publications. The dominance of China can be attributed to its rapidly growing FinTech market, which is underpinned by strong government support and consumer adoption. Cultural factors such as a high level of technological acceptance and a preference for cashless transactions have driven the widespread adoption of digital payment systems like Alipay and WeChat Pay (Chen, You, & Chang, 2021). Regulatory initiatives, including the establishment of a sandbox for FinTech innovation and the People's Bank of China's pilot programs for digital currencies, have further facilitated growth (Li, 2022). These advancements have significantly enhanced the efficiency and competitiveness of Chinese banks, with research focusing on areas such as mobile payments, blockchain, and AI-driven lending platforms (He et al., 2017). India, with 29 publications, stands out as a key player in the FinTech ecosystem. The government's Digital India initiative and the introduction of platforms such as Unified

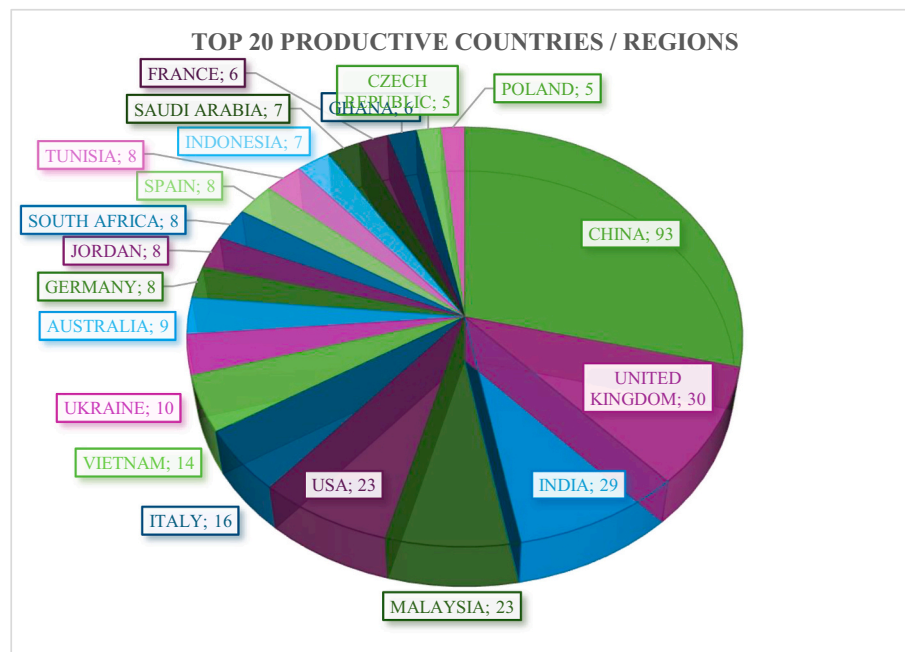


Fig. 4. The most productive countries / regions.

Payments Interface (UPI) have democratized financial access and increased FinTech adoption among banks. Cultural factors, such as a young, tech-savvy population and a high rate of smartphone penetration, have amplified the impact of FinTech on improving operational efficiency and customer outreach in Indian banks (Puri, Kaur, Kalra, & Gill, 2024). However, challenges such as low financial literacy in rural areas and a fragmented regulatory landscape limit the uniformity of adoption across the country (Thomas et al., 2024). The United Kingdom (UK) and the United States (US), each contributing around 10 % of publications, reflect the influence of mature financial markets and well-established regulatory frameworks. In these regions, FinTech innovation has been deeply integrated into traditional banking practices, particularly in global financial hubs such as London and New York (Dasilas & Karanović, 2023). Cultural openness to technological innovation, coupled with regulatory initiatives like the UK's Open Banking standards and the US's Consumer Financial Protection Bureau (CFPB) regulatory sandbox, has encouraged collaboration between traditional banks and FinTech firms. Research from these regions often focuses on the strategic role of FinTech in improving customer experience, risk management, and compliance (Stefanelli & Manta, 2023). In contrast, regions such as Africa and Latin America remain underrepresented in the literature, despite their unique cultural and financial contexts. In Africa, the adoption of FinTech has been driven by the need for financial inclusion and the success of mobile payment systems like M-Pesa in Kenya (Chebii, Chemaket, Waweru, & Mutua, 2024). Cultural factors, such as reliance on informal financial systems and the absence of legacy banking infrastructure, have allowed FinTech to play a transformative role in bridging financial gaps (Elgharib, 2024). However, limited academic output from African institutions indicates the need for further research to explore how FinTech can improve banking performance in these underbanked regions.

Latin America is another region with significant potential for FinTech adoption due to a large unbanked population and growing internet penetration. Countries like Brazil and Mexico are emerging as FinTech hubs, with innovations in microfinance and peer-to-peer lending addressing long-standing challenges in financial accessibility (Bortoluzzo, Minardi, Bortoluzzo, & Fernandes, 2024). However, the fragmented regulatory frameworks across Latin American countries pose challenges to scaling FinTech solutions. Research in this region

could provide valuable insights into the role of FinTech in enabling financial inclusion and improving banking efficiency in similar developing economies (Polloni-Silva, da Costa, Morales, & Sacomano Neto, 2021).

Geographically skewed data in our analysis highlights the need to expand the scope to include diverse regulatory and cultural contexts. For example, the focus on China and India reflects regions with strong government-backed initiatives and tech-savvy populations. However, the impact of FinTech in regions with alternative financial systems, such as microfinance in Africa and Latin America, remains underexplored. Expanding research into these areas would enhance the global applicability of the findings and provide a more comprehensive understanding of FinTech's transformative potential.

In terms of institutional contributions, the top five institutions producing the most research include Peking University (China), the University of Malaysia (Malaysia), the University of Economics and Law (Vietnam), Vietnam National University (Vietnam), and Xi'an Jiao Tong University (China) (shown in Fig. 5). These institutions are also home to some of the most prolific authors, indicating the regional concentration of research output. While these institutions have made significant contributions to understanding FinTech's impact on banking, collaboration with institutions from underrepresented regions could foster a broader and more inclusive perspective.

In conclusion, cultural and geographical factors significantly influence the adoption and impact of FinTech on banking performance. While technological acceptance, regulatory frameworks, and market characteristics drive adoption in developed regions, financial inclusion and infrastructure gaps present unique opportunities in emerging markets. Addressing these regional disparities in research and exploring the role of FinTech in alternative financial systems will be critical for advancing a more globally representative understanding of its impact.

4.2. Decoding the DNA of FinTech and banking: Tracing intellectual lineages

Science mapping is a set of techniques used to visually represent the structure, development, and interrelationships within scientific research fields. It helps in understanding the evolution of research areas, identifying core topics, and recognizing influential works and authors

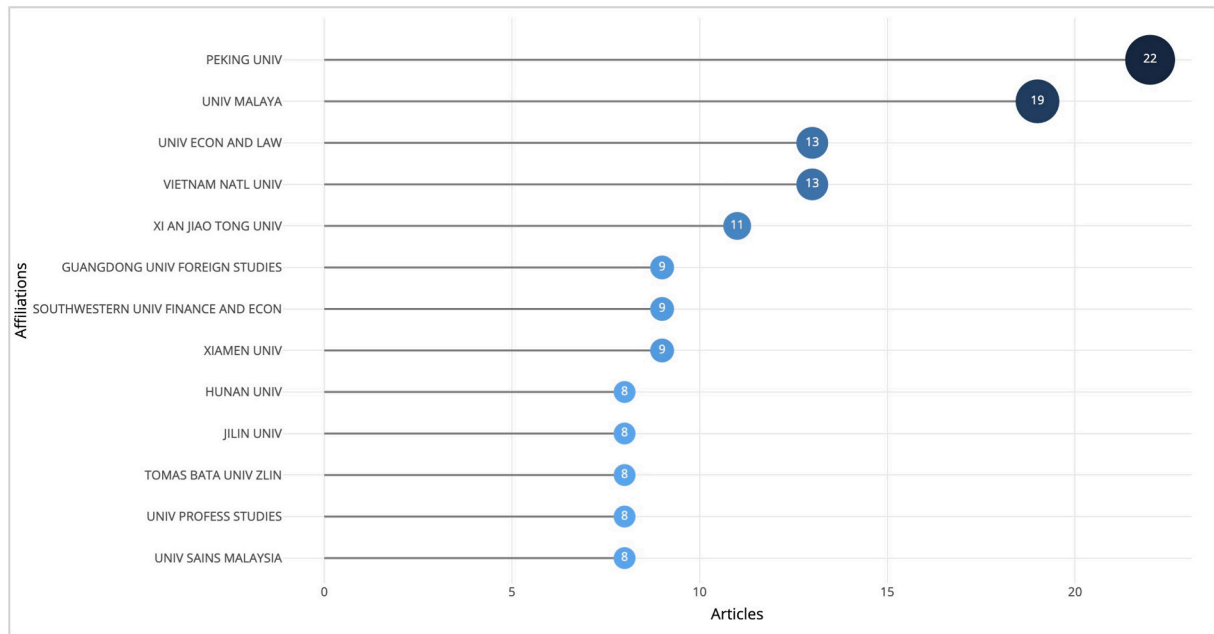


Fig. 5. Most relevant Affiliations with more than four TP.

(Donthu et al., 2021). In order to trace the intellectual lineage of the impact of FinTech on bank performance, this section includes co-authorship analysis and citation analysis.

4.2.1. Co-authorship analysis

Collaborating with other authors can significantly boost the quality of published papers while also enriching the intellectual contributions and variety of ideas within a specific field (Ramsawak et al., 2023). In this study, we have figured out several group of collaboration between authors and analyze their topic themes. As shown in Fig. 6, each node illustrated as a bubble represents an author. The node size can indicate the number of publications. Lines connecting nodes represent co-authorship relationships, meaning the authors have collaborated on one or more publications. Nodes are often color-coded to represent different clusters or groups of authors who frequently collaborate with each other. Each color represents a distinct group of interconnected authors. The distance between nodes indicates the closeness of the

collaboration. Authors who frequently co-author papers are positioned closer to each other.

The largest and most prominent cluster, represented in orange, includes Hasanul Banna, Md. Rabiul Alam, Kabir Hassan, and Rubi Ahmad. Their work centers on the impact of FinTech innovations on the Islamic banking system in ASEAN countries. These studies explore Sharia-compliant digital banking tools, mobile payment systems, and other FinTech technologies that enhance financial inclusion, operational efficiency, and customer satisfaction in Islamic financial institutions. This research underscores how FinTech solutions are tailored to meet the regulatory and cultural needs of Islamic banking, providing an important avenue for improving access to financial services in regions with specific religious and regulatory requirements. The prominence of this cluster reflects growing academic interest in how FinTech adapts to the complexities of Islamic banking, which is a significant segment in ASEAN economies.

Another critical cluster, shown in brown, includes Maoyong Cheng,

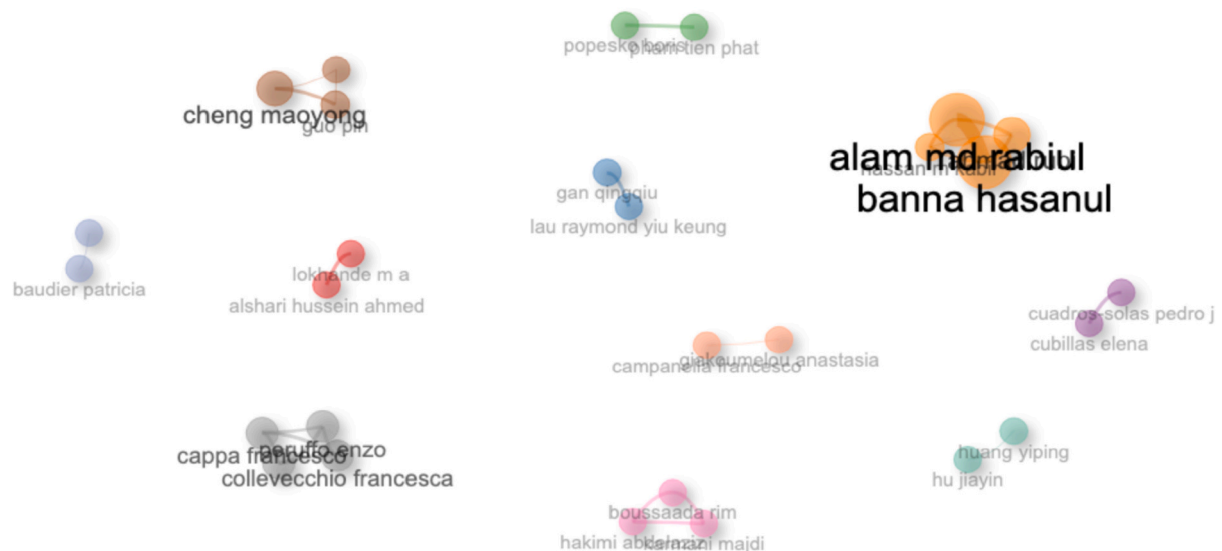


Fig. 6. Co-authorship network visualization.

Pin Guo, and Zhixian Gao, whose research is focused on the role of FinTech in transforming China's banking sector. This body of work highlights key FinTech innovations, such as AI-driven credit scoring, blockchain applications, and mobile payment platforms, which have been instrumental in enhancing operational efficiency, risk management, and customer experience in Chinese banks. These studies further emphasize the supportive regulatory landscape and government policies that facilitate FinTech adoption in China, cementing the country's position as a global leader in financial technology. This cluster not only showcases the transformative effects of FinTech on Chinese banks but also positions China as a reference point for the rest of the world in integrating financial technologies.

The gray cluster features Francesco Cappa, Francesca Collevocchio, Raffaele Oriani, and Enzo Peruffo, who investigate the role of mergers and acquisitions (M&A) with FinTech firms in transforming traditional banks. Their research highlights how strategic alliances with FinTech companies enable banks to acquire technological capabilities, improve customer engagement, and remain competitive in a rapidly evolving financial services landscape. This cluster underscores the importance of collaboration and innovation as key drivers of digital transformation in the banking industry, emphasizing the strategic value of FinTech partnerships.

Apart from the three main themes, the smaller co-authorship also represents emerging or niche areas. The pink cluster, which includes Hakimi Abdelaziz, Boussaada Rim, and Karmani Majdi, focuses on financial inclusion and bank stability in the MENA (Middle East and North Africa) region. This cluster addresses the dual challenges of extending financial access while maintaining bank stability in developing economies. The dark green cluster, represented by Huang Yiping and Hu Jiayin, investigates the impact of digital transformation on bank credit risk. Their research examines how digital technologies, such as advanced data analytics and AI tools, reshape credit risk management processes, allowing banks to more effectively evaluate and mitigate lending risks. The clear green cluster, featuring Pham Tien Phat and Popesko Boris, also focuses on digital transformation but shifts the emphasis toward operational efficiency and broader structural impacts on banking systems. Their work investigates how technology-driven changes improve overall banking processes and performance. The blue cluster, led by Gan Qingqiu and Lau Raymond Yiu Keung, focuses on blockchain applications and the regulatory frameworks necessary to support FinTech innovation. This research highlights the potential of blockchain to improve transparency, security, and efficiency in banking operations, as well as the importance of robust regulations to mitigate risks associated with these technologies. Similarly, the dark blue bubble, represented by Baudier Patricia, delves into blockchain's broader implications for financial stability and innovation, emphasizing its transformative potential within the financial services industry. The purple cluster, led by Cuadros-Solas Pedro J. and Cubillas Elena, examines the impact of FinTech on bank stability and market power. Lastly, the red cluster, represented by Al-Shari Hussein Ahmed and Lokhande M. A., employs PLS-SEM methodologies to test the impact of FinTech innovations on bank performance. Their research provides empirical evidence of how FinTech adoption affects key performance indicators such as profitability, operational efficiency, and customer satisfaction. Additionally, the orange cluster (Campanella Francesco and Giakoumelou Anastasia) investigates FinTech's broader role in reshaping financial systems, particularly its implications for capital-intensive operations and the development of a highly skilled workforce.

The co-authorship analysis reveals several broader patterns that provide insights into the collaborative dynamics and thematic foci shaping research on the impact of FinTech on bank performance. A strong regional concentration is evident, with distinct clusters exploring geographically specific topics, such as the role of FinTech in Islamic banking systems in ASEAN countries, FinTech-driven transformation in China's banking sector, and financial inclusion challenges in the MENA region. These clusters underscore how regional regulations, cultural

contexts, and market dynamics heavily influence FinTech adoption and its impact on banking systems. The research field is thematically diverse, with clusters focusing on operational efficiency, risk management, strategic responses such as mergers and acquisitions, financial inclusion, and consumer behavior. This thematic segmentation reflects the multifaceted impact of FinTech on banking, but it also reveals gaps, such as the limited focus on sustainability and cross-industry applications of FinTech. Collaboration within clusters tends to be highly concentrated, with limited interaction across different thematic areas, resulting in a siloed approach to research. Smaller clusters focusing on blockchain applications and digital transformation highlight emerging areas of interest, but these remain relatively underdeveloped compared to the dominant clusters. Methodologically, the field is diverse, employing quantitative approaches like PLS-SEM and panel data analysis, alongside qualitative strategic analyses of M&A. However, innovative methodologies, such as comparative cross-country studies or AI-driven big data analytics, are underutilized and could enhance understanding of FinTech's long-term and global impacts. To advance the field, fostering cross-thematic and cross-regional collaboration is essential, as it would bridge gaps and create a holistic view of FinTech's impact on banking.

As for the countries' collaboration, in the world map of Fig. 7, the darker shades indicating a larger volume of research output in the specified field and the lines connecting countries represent collaborative relationships. The major collaborating countries are China, the United States, India and the United Kingdom, which coincides with these countries' leading positions in FinTech and banking research. There are also clusters of co-operation within specific regions. For example, European countries often collaborate with each other. Similarly, there is a significant amount of co-operation in the Asia-Pacific region, involving countries such as China, India, and Malaysia. This may be due to geographical proximity, cultural understanding, joint funding opportunities and political agreements. For example, the European Research Area (ERA) aims to create a unified research space that encourages collaborations across EU countries. By fostering closer ties within regions, researchers can enhance the impact and relevance of their work, contributing to regional and global advancements in the field.

4.2.2. Citation analysis

Citation analysis is a crucial method for evaluating the impact and influence of academic publications, allowing researchers to identify significant contributions within a field. Citations serve multiple purposes: they give credit to prior research, provide supporting evidence for claims, and guide readers to additional relevant studies. A high citation count typically signifies that a work has been widely recognized and influential within its academic community. In the case of the 408 articles reviewed for this study, they collectively received 6106 citations, with an average of 14.97 citations per article.

Table 5 highlights the most influential articles with the highest citations published each year from 2008 to the second quarter of 2024. The most cited article, authored by Au and Kauffman (2008), has accumulated 239 citations. This paper explores the economics of mobile payments and is foundational in the FinTech literature, reflecting its enduring relevance. The second most cited article, authored by Chang et al. (2020), focuses on the transformative influence of blockchain in financial services and has garnered 199 citations. This review is notable for synthesizing insights into how blockchain reshapes operational and strategic dimensions within financial systems. Among the articles in 2021, Wang et al. (2021) conducted an empirical analysis using big data to assess the impact of FinTech on the operational efficiency of China's commercial banks. Their study has quickly gained recognition, underlining the importance of empirical research in understanding FinTech's practical implications. Another significant paper, published in 2022 and titled "Riding the FinTech Innovation Wave: FinTech, Patents and Bank Performance," investigates the effects of FinTech development and financial innovation on bank performance using the CAMEL framework (capital adequacy, asset quality, management efficiency, earnings

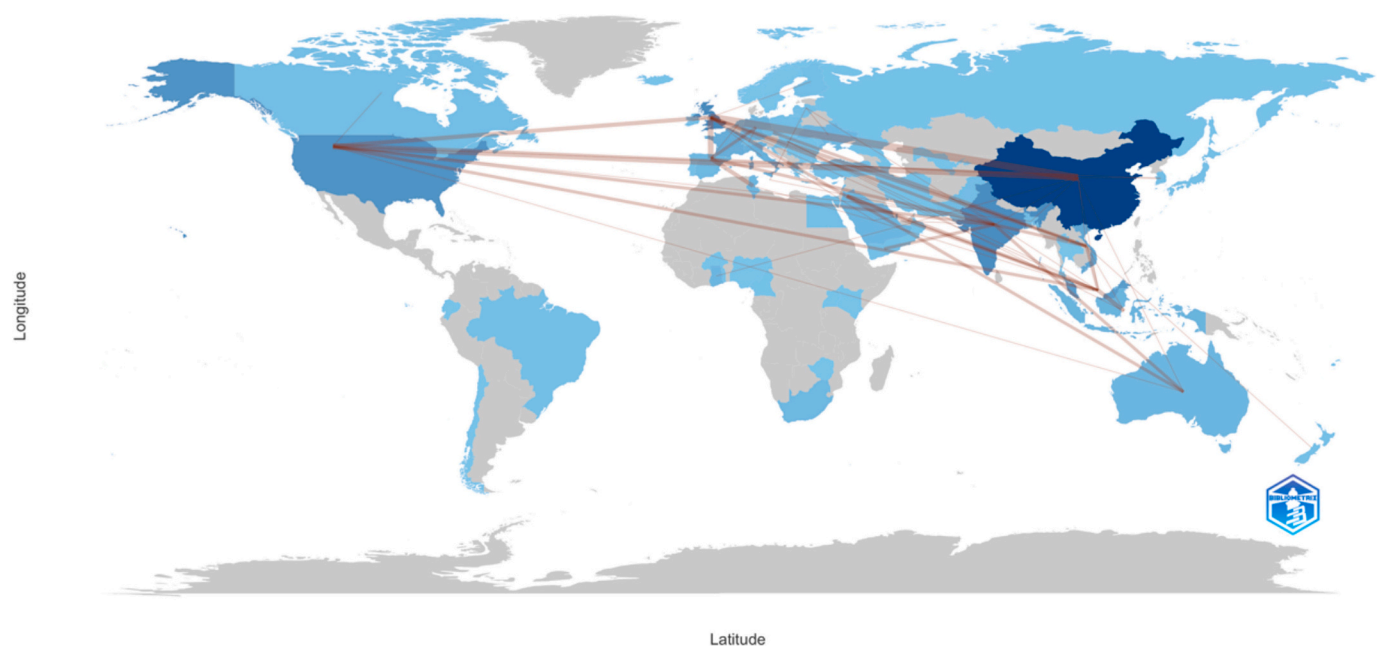


Fig. 7. Counties’ collaboration world map.

Table 5
Most cited articles per year.

Year	Article	Total Citations	Source
2008	The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application	239	Electronic Commerce Research And Applications
2012	Structural modeling and mapping of m-banking influencers in India	19	Journal of Electronic Commerce Research
2016	Internet finance development and banking market discipline: Evidence from China	76	Journal of Financial Stability
2017	Financial Inclusion, Bank Concentration, and Firm Performance	110	World Development
2018	Cryptocurrencies and Business Ethics	100	Journal of Business Ethics
2019	The roles of alternative data and machine learning in fintech lending: Evidence from the lendingclub consumer platform	112	Financial Management
2020	How Blockchain can impact financial services - The overview, challenges and recommendations from expert interviewees	199	Technological Forecasting and Social Change
2021	Can fintech improve the efficiency of commercial banks? - An analysis based on big data	124	Research in International Business and Finance
2022	Riding the fintech innovation wave: fintech, patents and bank performance	116	Journal of International Money and Finance
2023	Fintech and financing constraints of enterprises: Evidence from China	41	Emerging Markets Finance and Trade
2024	The role of digital accounting transformation in the banking industry sector: an integrated model	18	Journal of Financial Reporting and Accounting

Source(s): Prepared by Author.

power, and liquidity). Despite their relatively recent publication dates, these two articles have already received over 100 citations, showcasing the increasing importance of empirical and innovation-focused studies in the FinTech field.

This citation analysis underscores the ongoing relevance of contemporary research in FinTech and bank performance. It highlights how recent studies, particularly those employing empirical methods or addressing innovation, are being rapidly cited, reflecting the dynamic nature of this field and the growing academic and practical interest in the intersection of FinTech and banking.

4.3. From connections to clusters: Visualizing the key clusters and themes in Fintech and bank performance research

4.3.1. Co-occurrence, clustering, and content analysis

In order to address RQ4 and have a comprehensive view of the research aim of the studies which analyze the impact of FinTech on bank performance, this study has conducted co-occurrence, clustering and content analysis using Biblioshiny, VosViewer program and manual review.

Co-occurrence analysis is a widely used bibliometric technique that examines the frequency and relationships between key terms in academic literature. By mapping author keywords that frequently appear together, this method helps identify major research themes, emerging trends, and the overall structure of a particular field of study (Chang, Huang, & Lin, 2015). In this case, co-occurrence analysis has been applied to explore the impact of fintech on banks, revealing the interconnected topics and focal points within the academic discourse. The research landscape on the impact of FinTech on bank performance, as analyzed using Biblioshiny, reveals three distinct thematic clusters, each representing a key focus area within the literature (see Fig. 9). These clusters collectively encompass the breadth of scholarly attention on the topic and provide a framework for understanding how FinTech affects banking operations and performance. Below, we provide a clearer definition of each cluster, along with examples of key studies and their contributions.

4.3.1.1. Cluster 1: Bank Performance Metrics (Green Cluster in Fig. 8). Cluster 1 is centered on evaluating the impact of FinTech on measurable bank performance indicators, including efficiency, profitability, market dynamics, competition, risk management, and credit assessment. This cluster adopts a traditional, quantitative approach, emphasizing the direct and quantifiable impacts of FinTech on banks’ financial health and operational effectiveness. Studies in this cluster often utilize

econometric models, regression analysis, and panel data techniques to explore these relationships.

For example, [Hou et al. \(2016\)](#) examined how internet finance influences bank operational efficiency, finding that FinTech enhances cost efficiency through digital platforms. Similarly, [Cheng and Qu \(2020\)](#) analyzed the role of AI-driven credit scoring in reducing non-performing loans, highlighting FinTech's impact on risk management and profitability. This cluster includes approximately 40 % of the articles reviewed, reflecting its dominant position in the literature and its focus on core performance metrics critical to the banking industry's sustainability.

4.3.1.2. Cluster 2: Industry Transformation (Red Cluster in Fig. 8). Cluster 2 focuses on the systemic and strategic changes driven by FinTech within the financial services industry. Themes in this cluster include innovation, technological adoption, industry evolution, and the integration of FinTech solutions into traditional banking models. Research here examines how banks and financial institutions adapt to disruptive technologies to remain competitive, enhance operational efficiency, and meet evolving market demands.

Key examples include [Karim and Lucey \(2024\)](#), who investigated the adoption of blockchain in cross-border payments, demonstrating how FinTech reshapes operational processes and improves cost efficiency. Another study by [Banna, Hassan, Ahmad, and Alam \(2022\)](#) explored the strategic alignment of FinTech investments with bank growth objectives, emphasizing the importance of digital transformation for long-term sustainability. This cluster accounts for approximately 35 % of the reviewed articles and highlights the role of FinTech in driving structural changes in the banking industry.

4.3.1.3. Cluster 3: Consumer Perspective (Blue Cluster in Fig. 8). The third cluster focuses on the behavioral and psychological aspects of FinTech adoption, including factors such as user acceptance, perceived risk, consumer behavior, trust, and intention to adopt. This cluster explores how FinTech innovations are perceived and utilized by end-users, emphasizing the importance of trust, security, and usability in driving adoption.

For instance, [Saxena, Gera, and Taneja \(2023\)](#) investigated the

factors influencing mobile banking adoption in India, identifying trust and perceived ease of use as critical determinants. Similarly, [Chawla and Joshi \(2019\)](#) studied how perceived security impacts consumer trust in digital wallets, finding that consumer trust plays a pivotal role in adoption rates. This cluster constitutes 25 % of the reviewed articles, reflecting the importance of understanding consumer behavior in the successful implementation of FinTech solutions.

In summary, the research focus of the reviewed articles on the impact of FinTech on bank performance can be delineated into three overarching aspects: FinTech firms, banks, and consumers. These three clusters represent the core components of the FinTech ecosystem, each playing a vital role in shaping the ongoing transformation of the financial industry. The interconnectedness of these clusters highlights the multifaceted nature of the topic, where technological innovation, institutional adaptation, and consumer behavior collectively drive the evolution of banking performance in the FinTech era.

The visualization generated using VosViewer displays a network of keywords grouped into clusters based on their co-occurrence strength, providing insight into the main research areas within this field.

The [Fig. 9](#) presents a co-occurrence network of author keywords based on a threshold of seven occurrences, resulting in 98 keywords from an initial set of 1670. The network is divided into four distinct clusters, each represented by a different color, illustrating key thematic areas in fintech and banking research. The size of the nodes reflects the frequency of keyword occurrences, while the lines between them indicate the strength of their co-occurrence relationships. This visualization provides a comprehensive overview of how fintech-related research is structured and how different themes interconnect within the academic literature.

The red cluster, labeled as “impact,” consists of 35 items and focuses on themes related to risk, competition, and financial inclusion. Keywords such as “risk,” “competition,” “financial inclusion,” “efficiency,” and “bank performance” are central to this cluster. With a total link strength of 556 and 107 occurrences, this cluster highlights the challenges that banks face due to the rise of fintech ([Hakimi et al., 2022](#); [Hao, Peng, & He, 2023](#); [Li et al., 2022](#)). The strong interconnections suggest that financial stability, firm performance, and credit accessibility are significant concerns in discussions about fintech's disruptive

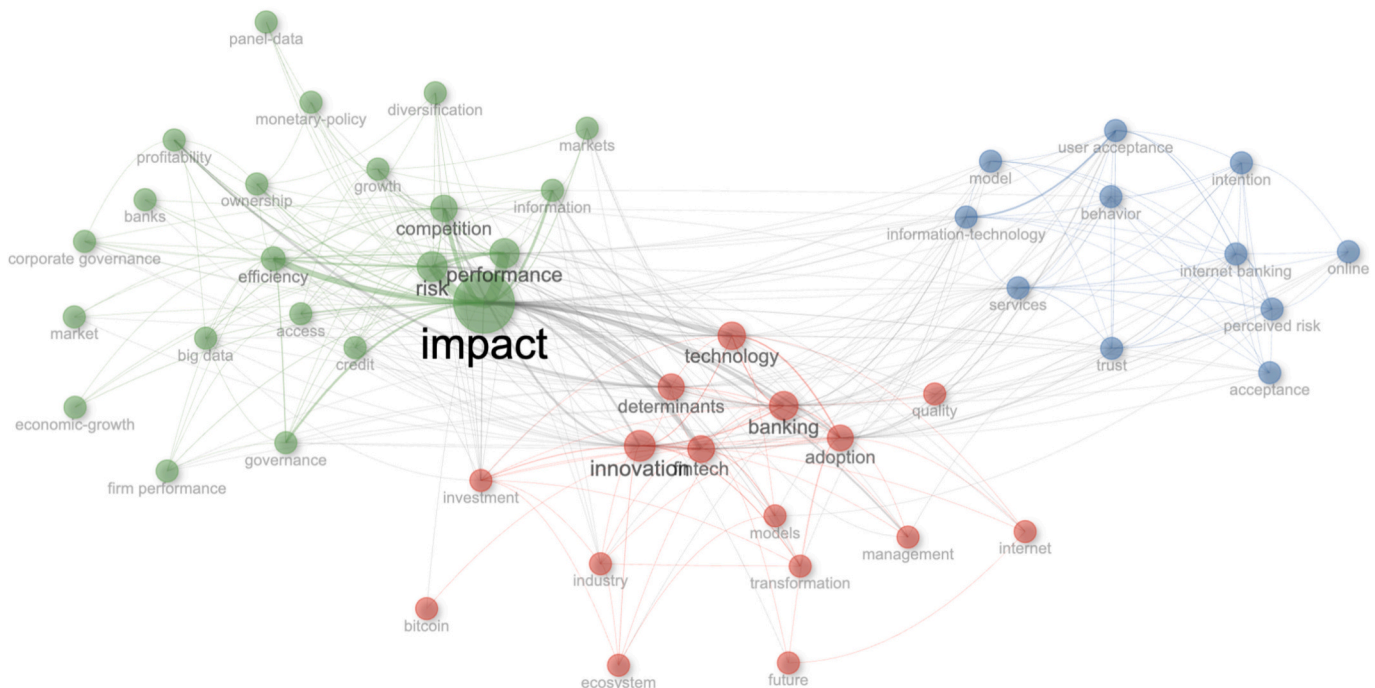


Fig. 8. Co-occurrence and cluster network by Biblioshiny.

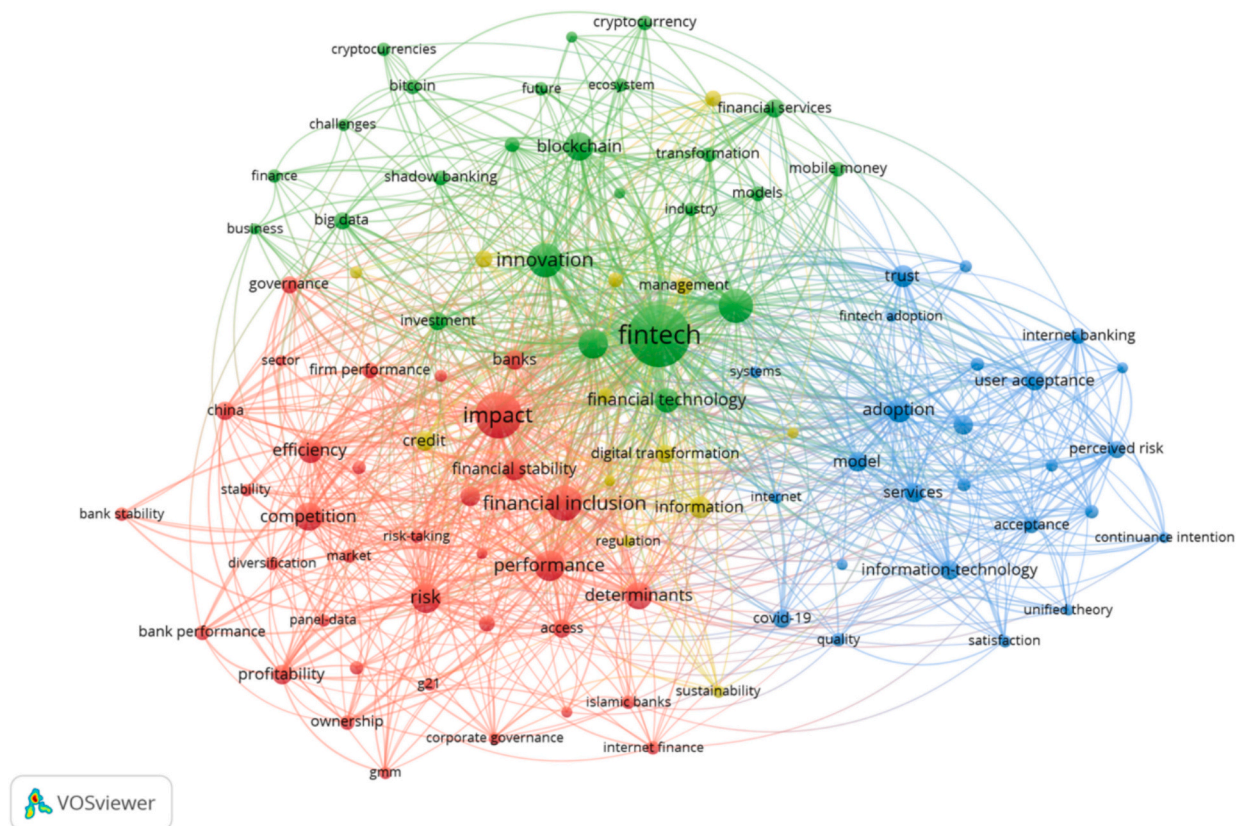


Fig. 9. Co-occurrence and cluster network by VosViewer.

role in traditional banking. Research in this cluster often examines how fintech firms create competitive pressure on traditional banks, forcing them to innovate and improve efficiency. Fintech disrupts conventional banking models by offering cost-effective, technology-driven financial solutions, leading to concerns over credit risk and financial stability. Additionally, the cluster underscores the broader economic impact of fintech on bank profitability and market competition, with studies investigating how regulatory frameworks can mitigate associated risks.

The green cluster, centered around the term “fintech”, is the most dominant in the visualization, comprising 25 items. It includes closely related concepts such as “blockchain”, “innovation”, “financial technology”, and “digital transformation”. This cluster has the highest total link strength of 792 and 190 occurrences, indicating its strong presence in fintech research (Melnychenko, Volosovych, & Baraniuk, 2020; Sazu, Jahan, Sazu, & Jahan, 2022; Vives, 2019). The emphasis on blockchain, big data, and shadow banking suggests that this cluster primarily explores the role of technological advancements, alternative financial solutions, and investment trends in reshaping the banking industry. Blockchain, in particular, has been a transformative force, reducing transaction costs, enhancing security, and improving transparency in banking operations. Fintech-driven innovation, such as artificial intelligence (AI) and machine learning, further improves risk assessment and fraud detection mechanisms. This cluster also highlights the role of big data analytics in personalizing financial services and optimizing decision-making processes, showcasing fintech’s broader impact on financial institutions.

The blue cluster is primarily concerned with fintech adoption, with keywords like “trust”, “user acceptance”, “perceived risk”, “internet banking”, and “information technology”. With a total link strength of 189 and 32 occurrences, this cluster, though smaller, highlights crucial research areas related to consumer behavior and trust in fintech services (Hoang et al., 2021; Laksamana, Suharyanto, & Cahaya, 2023; Noreen, Ghazali, Shahin, & M., 2021). The interconnections suggest that trust,

perceived security, and satisfaction are key determinants of fintech adoption. The presence of terms such as “unified theory” and “continuance intention” further indicates that theoretical frameworks and behavioral models play an essential role in understanding how users accept and utilize fintech solutions. Studies in this cluster focus on consumer perceptions of fintech services, exploring the barriers and motivators that drive adoption. Perceived ease of use, digital literacy, and cybersecurity concerns play a crucial role in influencing user acceptance. Additionally, the cluster includes research on fintech’s role in promoting financial inclusion by providing banking services to previously unbanked populations, demonstrating how user adoption is essential to fintech’s success.

The yellow cluster, which is the smallest, consists of 13 items and focuses on digital transformation. With a total link strength of 95 and 17 occurrences, this cluster explores themes such as “digital transformation”, “models”, “sustainability”, and “regulation”. This cluster focuses on the impact of the industrial transformation on the business model and investigate the opportunities for innovative business models (Campanella, Serino, Battisti, Giakoumelou, & Karasamani, 2023; Murinde et al., 2022b; Taneja et al., 2024). Digital transformation in banking is driven by the need to integrate fintech innovations into existing financial systems. Research in this cluster emphasizes how traditional banks are restructuring their operations, investing in cloud computing, open banking, and AI-driven automation to stay competitive. The presence of governance-related keywords implies that regulatory frameworks and sustainability considerations are becoming increasingly relevant in discussions about financial technology. This cluster also explores the role of fintech in sustainable finance, examining how digital innovations can contribute to responsible investing, green banking, and ethical financial practices.

Overall, the visualization illustrates the multidimensional impact of fintech on banking, encompassing technological innovation, risks, competition, financial stability, and user adoption trends. The strong

interconnections between clusters highlight the interdisciplinary nature of fintech research, bridging financial technology, economics, and consumer behavior. Fintech acts as a central theme, linking innovation with both opportunities and challenges for the banking sector. While research on risk and competition remains prominent, growing interest in fintech adoption and regulatory aspects indicates a broader and evolving discourse in the field.

4.3.2. Content analysis

As this study delves deeper into the relationship between FinTech and bank performance, we manually collected empirical papers from the reviewed studies in the order of total citation to answer the RQ5. The empirical findings on the impact of FinTech on banks are mixed. Wang et.al (2021) and Zhao et al. (2022) discover that the advent of FinTech has increased the bank efficiency in China. Similarly, Le, Ho, Nguyen, and Ngo (2021) find a positive relationship by analyzing worldwide data. Efficiency is typically measured using metrics like Cost-to-Income Ratio (CIR) to compare a bank's costs to its income or profits. By using global, Indonesian, and Chinese data, Nguyen et al. (2021), Phan et al. (2020), and Zhao et al. (2022) all empirically prove the negative relationship between FinTech development and bank profitability. Profitability is often measured using Return on Assets (ROA) or Return on Equity (ROE), both of which assess a bank's ability to generate profits relative to its assets or equity. These findings suggest that FinTech may not always translate into higher profits for banks. Li et al. (2017) demonstrate that the investment in FinTech star-ups can increase the share price of retail banks. Zhao et al. (2022) and Dong et al. (2020) identify a detrimental influence of FinTech on bank liquidity, which can be measured using metrics like the Liquidity Coverage Ratio (LCR) or Net Stable Funding Ratio (NSFR). These ratios assess a bank's ability to withstand short-term and long-term liquidity shocks, respectively. A decrease in these measures could suggest that FinTech reduces the ability of banks to meet their liquidity needs. For bank stability and risk taking, Dong et al. (2020) and Fung, Lee, Yeh, and Yuen (2020) find that FinTech can increase the bank stability. Furthermore, Li and Xu (2021), Banna and Alam (2021) and Nguyen et al. (2021) find that FinTech can benefit banks by reducing credit risk, suggesting that the benefits of FinTech exceed the drawbacks. Credit risk is commonly measured using Non-Performing Loan (NPL) ratios, which show the proportion of loans that are in default. On the contrary, Zhao et al. (2022) provide evidence that FinTech may exacerbate banks' risk-taking behaviors by accumulating FinTech data in alternative methods, with risk-taking measured using metrics such as the Loan-to-Deposit Ratio (LDR) or Leverage Ratio, which reflect the level of risk exposure a bank faces. Apart from the above-mentioned bank performance measurements, Dong et al. (2020)

suggest that FinTech does not impede bank growth but may actually accelerate bank expansion. Growth can be measured through metrics like Asset Growth Rate or Loan Growth Rate, which assess how quickly a bank is expanding its balance sheet and customer base. Table 6 summarizes the different findings on the relationship between FinTech and bank performance. The most commonly used metrics to assess bank performance include efficiency, profitability, stability, risk-taking, liquidity, growth, and capital adequacy. These indicators offer a comprehensive view of a bank's operational and financial health. However, there remains ample opportunity for future research to explore additional aspects of bank performance, such as customer satisfaction, technological adoption, environmental sustainability, and social impact, which could provide a more holistic perspective on bank performance. As for empirical techniques, the Generalized Method of Moments (GMM) has emerged as a predominant empirical technique for testing the impact of FinTech on banks, owing to its robustness in addressing endogeneity issues and handling dynamic panel data. Among the variations of GMM, the Two-step GMM is frequently utilized for its enhanced efficiency by optimizing the weighting matrix. The Difference GMM (DFF-GMM) is particularly effective in controlling for unobserved heterogeneity by differencing the data, while the System GMM (SYS-GMM) offers further refinement by incorporating both differenced and level equations, thereby improving the precision of the estimates. The geographic focus of the top ten most influential papers spans a diverse set of regions, including China, the United States, Indonesia, ASEAN countries, and analyses with a global perspective. These studies have provided valuable insights into the FinTech -bank nexus within these specific contexts. However, there remains a significant research opportunity to investigate whether the observed effects hold true in other regions, such as Europe, Latin America, Africa, and the Middle East. Exploring these under-researched areas could yield important findings that contribute to a more nuanced understanding of how FinTech influences bank performance across different economic, regulatory, and cultural environments.

4.3.3. Thematic analysis

Aiming at figuring out the research topics, we use thematic map to find out the research gaps relating to the impact of FinTech on bank performance (see Fig. 10). The thematic map in Biblioshiny organizes themes based on two key dimensions: density and centrality. Density measures the internal strength and development of a theme. High-density themes are often well-established and have a strong theoretical or methodological foundation. Centrality assesses the external relevance of a theme, and the higher centrality level of a theme, the more influential and central to the domain. Normally there are four

Table 6

Relationship between FinTech and bank performance in different regions (“+” indicates positive relationship and “-” indicates negative).

NO.	Author(s)/Year	Region	Sample period	Sample size	Bank performance	Impact	Empirical technique
1	Wang et al. (2021)	China	2009–2018	113 banks	efficiency capital adequacy asset quality	+ + -	DFF-GMM; SYS-GMM
2	Zhao et al. (2021)	China	2003–2018	120 banks	efficiency profitability liquidity profitability	+ - - +	two-step system GMM
3	Dong et al. (2020)	China	2006–2018	24 banks	liquidity stability growth	- + +	DFF-GMM; SYS-GMM
4	Li et al. (2017)	USA	2010–2016	47 banks	share price	+	Fixed model
5	Fung et al. (2020)	Global	2010–2017	1375 banks	stability	+	Fixed model
6	Li et al. (2022)	China	2008–2020	65 banks	risk-taking	-	DFF-GMM
7	Banna and Alam (2021)	ASEAN	2011–2019	253 banks	risk-taking	-	two-step GMM
8	Le et al. (2021)	Global	2013–2017	203 banks	efficiency	+	GMM
9	Nguyen et al. (2021)	Global	2013–2018	73 countries	profitability risk-taking	- +	GMM
10	Phan et al. (2020)	Indonesia	1998–2017	41 banks	profitability	-	two-step GMM

Source(s): Prepared by Author.

quadrants in a thematic map: 1) Motor themes (high density, high centrality): These are well-developed and influential themes that play a central role in the research field. They are often at the forefront of research and represent the driving forces in the discipline. In our results, there are three motor themes. The first analyzes the impact of financial innovation on the bank performance. The most cited article in this theme is of Zhao et al. (2022), which used both patent data and FinTech development index to examine the impact of financial technology innovation on Chinese bank performance. The performance is measured by CAMEL system including capital adequacy, asset quality, management efficiency and liquidity. They discovered that FinTech can increase the capital adequacy and efficiency of banks while worsen the profitability, liquidity and asset quality. The second large motor theme include the model, services and information-technology. The study of Sheng (2021) examines the relationship between FinTech advancements and banks' lending behaviors, particularly focusing on whether FinTech enhances or inhibits credit availability for SMEs by analyzing the lending records of banks in Chinese provinces from 2011 to 2018. The findings suggest that FinTech has a significant impact on banks' credit decisions, potentially leading to greater financial inclusion for SMEs. It may also influence the competitive dynamics between FinTech firms and traditional banks. The third motor theme has the keywords "sector", "stability" and "volatility". Under this theme, the most cited article is from Chen, Wang, Zhu, Xie, and Uddin (2023). The paper provides a detailed analysis of the evolving relationship between FinTech and traditional financial institutions in China, using a quantile-based approach to capture the complexities of their interconnectedness across different market environments. This theme aims to explore whether FinTech will bring volatility or stability to the financial sector. 2) Basic themes (low density, high centrality): They are fundamental to the field, serving as essential building blocks for other research areas. While they may not be as well-developed, their high centrality indicates their broad applicability and importance. There is one basic theme for our study. And the most cited article of Wang et al. (2021) used big data to examine if FinTech can improve the efficiency of commercial banks in China. 3) Niche themes (high density, low centrality): These themes are highly specialized and well-developed but have limited connections to the broader research field. They represent areas of focused research that may not yet have widespread influence. The article of Dong et al. (2020) examines how internet finance impacts commercial banks in China,

influencing their economic performance, strategic approaches, and technological and operational capabilities. 4) Emerging or declining themes (low density, low centrality): These themes are less developed and less central, indicating that they may be in the early stages of research interest or, conversely, may be declining in relevance. In total there are three themes. The first theme is related to the keywords "entrepreneurship, poverty and costs". The most cited paper of Adbi and Natarajan (2023) examines how the collaboration between FinTech and banks supports entrepreneurship by providing cost-effective financial services, which in turn can help reduce poverty by empowering micro-entrepreneurs. The second theme is "demand". The article of Allen (2024) discusses how electronic wages contribute to greater financial inclusion, potentially increasing demand for digital payment systems in previously underserved or cash-based communities. The article examines how the collaboration between FinTech and banks supports entrepreneurship by providing cost-effective financial services, which in turn can help reduce poverty by empowering microentrepreneurs. The third theme relates to "private". The article of Kahn, Rivadeneyra, and Wong (2018) examines the implications of central bank-issued e-money on the private sector, addressing competition, the division of roles between public and private entities, privacy issues, and potential collaborations. From the publication year we can extrapolate that the first two themes should be emerging topics while the private theme is the declining topic.

5. Discussions and conclusions

5.1. Main findings and discussion

This paper investigates the impact of FinTech on bank performance through a comprehensive systematic and bibliometric analysis of publications from the Web of Science Core Database published between 2015 and July 2024. The study employs the R-package litsearchr for keyword search string development and uses VosViewer and Bibliometrix for science mapping and network analysis. The research addresses six key questions, including current research patterns, influential authors and sources, geographical influences, notable research clusters, the aspects of bank performance affected by FinTech, and research gaps.

Based on the review of the publication trends, we found a significant increase in publications on the impact of FinTech on banks, especially since 2016, reflecting growing academic interest in this area. It can be

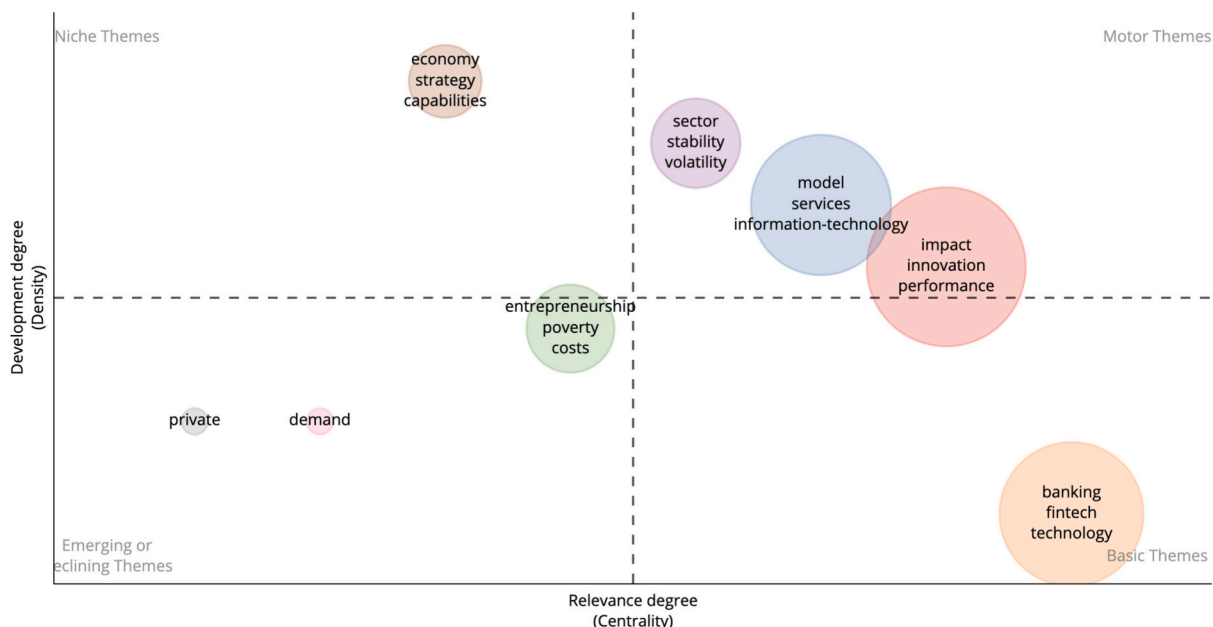


Fig. 10. Thematic map.

attributed to the 2008 financial crisis, which initially brought this research topic into the academic spotlight, and the COVID-19 pandemic that began in 2020, along with the resulting changes in people's lifestyles and the financial sector, for truly allowing the topic to flourish. As for influential sources, high-impact journals such as *Finance Research Letters* and *Research in International Business and Finance* are leading in publishing related studies. Cheng Maoyong from China and Banna Hasanul from the UK are the top authors, each with four publications focused on the impact of FinTech on the Chinese banking system and the Islamic banking sector in ASEAN countries, respectively. The average H-index of the top 20 authors is around 16, indicating the high quality and relevance of their research, as evidenced by significant citation counts. We also discovered the geographical and institutional impact: China, India, the UK, and the USA are the most productive countries, with leading institutions contributing significantly to the field. The publication volume from these countries reflects their advanced FinTech development, strong government support, and academic focus on the intersection of technology and banking. China and India lead with rapid FinTech growth and innovation driven by robust markets and supportive policies, while prestigious institutions in England and the USA contribute high-quality research, influenced by their roles as major global financial centers.

The science mapping analysis reveals three main clusters: bank performance metrics, the transformation of the financial industry, and the consumer perspective, which together highlight the interconnected nature of the impact of FinTech on bank performance. These three clusters—banks, FinTech firms, and consumers—are deeply intertwined because they represent the core components of the financial ecosystem. Banks, as traditional financial institutions, are directly impacted by the innovations and competitive pressures introduced by FinTech firms, which drive changes in efficiency, profitability, and risk management strategies. FinTech firms, on the other hand, push the boundaries of financial services by leveraging cutting-edge technology, creating new business models, and challenging the status quo of the banking industry. This dynamic interaction forces banks to innovate and adapt, often leading to partnerships or competition with FinTech firms. Consumers play a crucial role in this relationship, as their acceptance and adoption of FinTech solutions influence the direction of both banks and FinTech companies. The preferences and behaviors of consumers drive demand for more user-friendly, efficient, and secure financial services, which in turn compels banks and fintech firms to continuously evolve. In essence, the evolution of FinTech is not just a technological shift but a transformation shaped by the mutual influence and feedback between banks, FinTech firms, and the consumers they serve. This interconnectedness underscores the complex and multi-dimensional impact of FinTech on bank performance.

To illustrate the practical impact of FinTech on bank performance, several empirical cases demonstrate measurable outcomes across different regions and service domains. In Africa, mobile banking platforms such as M-Pesa have significantly advanced financial inclusion by providing accessible banking services to unbanked populations, resulting in increased deposit mobilization and enhanced customer engagement (Tuwei & Tully, 2021). In Southeast Asia, peer-to-peer (P2P) lending platforms like Funding Societies have improved credit accessibility for small and medium-sized enterprises (SMEs), prompting traditional banks to revise lending strategies and adopt more sophisticated risk assessment frameworks tailored to FinTech-driven competition (Zhao & Tsai, 2019). Meanwhile, major global banks like JPMorgan Chase have adopted blockchain-based systems for interbank payments, significantly reducing transaction time and costs, thus enhancing operational efficiency and liquidity management (Olaifa, 2025). These examples underscore how FinTech applications can drive quantifiable changes in banking practices across performance dimensions like profitability, inclusion, and efficiency.

The findings of this study hold profound implications for FinTech regulation and strategic policymaking. While FinTech has enhanced

banking efficiency, it also raises concerns about profitability, liquidity, and risk management. Policymakers need to adopt adaptive regulatory frameworks that mitigate systemic risks while fostering innovation. Regulatory sandboxes, risk-based supervision, and cross-border harmonization of FinTech policies can facilitate sustainable growth. In regions where FinTech is rapidly expanding—such as China and India—regulatory interventions should focus on consumer protection, cybersecurity, and digital financial literacy to ensure inclusive and responsible FinTech adoption. From a strategic perspective, banks must redefine their operational models to compete with or collaborate with FinTech firms. Traditional financial institutions can either develop proprietary FinTech solutions, engage in strategic alliances with FinTech startups, or leverage open banking frameworks to enhance service efficiency and consumer experience. The varying regional effects of FinTech—highlighted by differing impacts on profitability and stability—suggest that a one-size-fits-all approach to digital banking policies is ineffective. Instead, regulators and industry leaders must customize strategies based on the economic, technological, and regulatory landscapes of different markets.

The thematic analysis and review of high-impact studies reveal three primary motor themes that define the connection between FinTech and bank performance. First, financial innovation and bank performance, which explores how advancements in financial technologies influence key banking metrics, including capital adequacy, asset quality, profitability, and liquidity management. These innovations, while enhancing operational efficiency, also introduce challenges related to regulatory adaptation and risk mitigation. Second, FinTech advancements and bank lending behaviors, particularly their impact on SME financing and financial inclusion. Research suggests that FinTech-driven credit models expand access to funding for underserved businesses and individuals, potentially bridging gaps left by traditional banking institutions. However, this shift also intensifies competition between FinTech firms and conventional banks, prompting structural adjustments in lending strategies, risk assessments, and regulatory oversight. Third, sector stability and volatility, a theme centered on whether FinTech fosters greater resilience in financial systems or exacerbates market instability. While digital innovations enhance financial accessibility and efficiency, they may also introduce new forms of systemic risk, cybersecurity vulnerabilities, and regulatory challenges. The global variation in FinTech adoption and regulatory responses suggests that its impact on banking stability is highly contextual, influenced by market maturity, institutional frameworks, and technological infrastructure. Together, these themes highlight the complex and multifaceted relationship between FinTech and traditional banking. They underscore the need for proactive regulatory frameworks, strategic collaboration between banks and FinTech firms, and continuous research on the long-term financial stability implications of digital transformation. Future studies should further explore these dynamics across different financial ecosystems, especially in emerging markets, where FinTech adoption is rapidly reshaping banking landscapes.

5.2. Future research opportunities

Based on the analysis presented in the article, the following future research lines were identified to address gaps and opportunities within the current body of literature: (1) Exploration of Alternative Bank Performance Metrics: The article's findings highlight that existing research predominantly focuses on traditional metrics such as profitability, efficiency, and stability. However, as the financial industry evolves, there is a growing need to assess bank performance from a broader perspective. Future studies could examine additional dimensions like customer satisfaction, technological adoption, environmental sustainability, and social impact. These aspects are increasingly relevant in today's banking environment and could provide a more comprehensive understanding of a bank's overall performance, particularly in light of the growing influence of FinTech. A potential research question could be: How does

FinTech adoption influence the long-term sustainability and employee satisfaction of banks in varying market environments? (2) Regional Focus: While FinTech has significantly transformed banking in developed economies, its implications for underrepresented regions remain underexplored. The digital financial divide is a critical challenge, particularly in sub-Saharan Africa, Latin America, and parts of Southeast Asia, where FinTech adoption is constrained by infrastructure limitations, regulatory uncertainties, and low digital literacy levels. In these regions, FinTech presents both opportunities and risks. Digital financial solutions can enhance financial inclusion by providing unbanked populations with access to credit, mobile payments, and insurance services. However, the lack of strong regulatory frameworks in some underrepresented economies raises concerns about consumer protection, data privacy, and financial fraud. Policymakers in these regions must prioritize fintech literacy programs, cybersecurity enforcement, and interoperability between traditional banks and digital financial platforms to ensure that FinTech development leads to sustainable economic benefits rather than financial instability. Furthermore, global financial institutions and development agencies should support FinTech capacity-building initiatives in these regions, enabling local banks and startups to leverage technology while ensuring financial security and regulatory compliance. A greater focus on cross-country comparative studies could help policymakers draw lessons from successful FinTech adoption models in developed markets and tailor them to the needs of emerging economies. A potential research question could be: How can emerging economies effectively regulate FinTech to ensure that the benefits are widely distributed without creating new risks? (3) Emerging Themes: The thematic analysis and detailed review of the literature uncovered several emerging themes that have not yet been fully explored. One major gap is the missing link between technological innovations in banking and their strategic economic impact, highlighting the need for future studies to explore how fintech adoption influences national economic capabilities and competitive strategy. Additionally, more research is required to understand the effects of fintech innovations on banking sector stability, financial volatility, and systemic risk. Another critical area for exploration is the role of fintech in financial inclusion, poverty reduction, and entrepreneurship, particularly in underserved markets where traditional banking services are limited. Furthermore, future studies could investigate how fintech companies design business models that maximize efficiency, enhance financial accessibility, and optimize customer experience. Lastly, privacy concerns in fintech, including data security, digital identity, and regulatory compliance, require more in-depth examination, especially in regions with strict data protection laws. Addressing these gaps would provide a more comprehensive understanding of fintech's transformative role in the financial sector. A potential research question can be: What are the risk management strategies that banks can adopt when integrating FinTech solutions into their existing operations? (4) Advances in Methodology: The empirical findings in the article suggest that while existing methodologies have provided valuable insights, there is room for methodological advancements. While bibliometric and network analysis provide valuable insights into thematic evolution, future studies should incorporate machine learning and natural language processing (NLP) techniques to analyze large-scale textual data from financial reports, regulatory documents, and consumer sentiment analysis. Advanced econometric models, such as causal inference approaches (e.g., difference-in-differences models) and structural equation modeling, can further refine our understanding of cause-effect relationships between FinTech adoption and bank performance. Additionally, the role of alternative data sources, such as blockchain transaction records, digital lending patterns, and real-time payment data, should be explored to develop dynamic financial risk models. Methodologically, integrating behavioral economics with FinTech research could provide insights into consumer financial decision-making, trust in digital financial services, and the psychological barriers to FinTech adoption.

5.3. Contributions and limitations

One limitation of this study is its exclusive reliance on publications from the Web of Science Core Database. While WoS is a widely recognized and comprehensive academic resource, it may not fully capture the entire spectrum of research on the impact of FinTech on bank performance. Key insights from other databases (e.g., Scopus, IEEE Xplore), non-English publications, and industry reports are potentially overlooked, which may restrict the breadth and inclusivity of the analysis. Additionally, the exclusion of non-English publications introduces a language bias, leading to an overrepresentation of English-language research and potentially underrepresenting significant contributions from regions where FinTech is rapidly evolving, such as China, Japan, Germany, and Latin America. This Western-centric perspective may impact the generalizability of our findings, as FinTech adoption, regulatory landscapes, and banking structures vary significantly across different economic and institutional contexts. Furthermore, the study's reliance on existing literature means that well-researched areas may be overemphasized; while emerging or less-explored topics receive less attention. This could create gaps in understanding newer FinTech innovations or region-specific financial transformations that are still developing. To mitigate these limitations, future research should incorporate multilingual databases, conduct region-specific reviews, or leverage machine translation techniques to ensure a more comprehensive and globally inclusive understanding of FinTech's impact on banking systems. Expanding the data sources and methodological approaches will help capture a more diverse range of insights and provide a more balanced perspective on FinTech's role in shaping the global financial landscape.

This article has several meaningful contributions. Firstly, it presents a comprehensive and systematic bibliometric analysis, mapping the intellectual landscape of FinTech's influence on the banking sector. By identifying key research trends, influential authors, leading journals, and thematic clusters, this study provides a structured overview of the evolving discourse in this rapidly expanding field. It also highlights gaps in the literature, guiding future research toward underexplored yet critical areas. Secondly, this study deepens the academic discourse by analyzing the complex and multidimensional effects of FinTech on bank performance. It examines how FinTech influences efficiency, profitability, stability, and risk management, while also recognizing the regional variations in these effects. This context-sensitive approach underscores the need for localized regulatory frameworks and strategic responses, moving beyond one-size-fits-all interpretations of FinTech's role in banking. Thirdly, this paper contributes to future research by proposing key directions for further exploration. It advocates for the adoption of alternative bank performance metrics, an increased focus on regional diversity, and deeper investigation into emerging themes such as financial inclusion and FinTech-driven entrepreneurship. These insights provide a roadmap for scholars and policymakers, ensuring that future studies address both methodological gaps and real-world challenges in the FinTech-banking nexus. Overall, this paper serves as a foundational resource for academics, policymakers, and industry practitioners, offering a robust analytical framework and forward-looking perspectives on how FinTech is reshaping the global banking landscape.

CRedit authorship contribution statement

Feng Xu: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yuliya Kasperskaya:** Supervision, Project administration, Formal analysis, Conceptualization. **Martí Sagarra:** Visualization, Supervision, Software, Resources, Methodology, Data curation.

Declaration of competing interest

The authors have no conflicts of interest to declare.

Data availability

Data will be made available on request.

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