Fintech and Banking: A SLR and Future Research Scope

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Abstract—**The banking sector has undergone exponential change due to the emergence of fintechs. These changes have an impact on social mechanisms that control how This article's economic agents perform, necessitating a change in the function banks now play in the economy. Fintechs and banks have a clear link, but studies delving into the specifics of this interaction are still rare. This paper's goal is to outline a review and analysis of the existing state of research on banks and fintechs and to determine the potential future directions for this field of study. To do this, a systematic review of the literature was carried out, using predetermined inclusion and exclusion criteria to select and analyse 94 review articles (from 2019 to 2023) from Sciencedirect. The primary findings include the current state of literature on application of technology in banking and lastly the identification of future research agenda.**

Index Terms—*Systematic Literature Review, Review-based, Fintech, Banking, disruptive technology, Blockchain, Artificial Intelligence, Machine Learning*

I. INTRODUCTION

Fintech refers to the application of technology in the provision of financial services. Fintech companies leverage technological advancements to introduce new business models [1], improve operational processes, and offer innovative products and services [2] The emergence of fintech can be traced back to the 1990s, coinciding with the rise of the internet [3]. The internet has played a substantial role in the progression of the fintech segment. It has provided the substructure and connectivity essential for fintech corporations to function and connect to a wider audience. While using the internet, financial amenities can be brought online, permitting greater accessibility [4] and ease for users [5].

Furthermore, fintech has the capacity to disrupt the financial background by challenging recognized incumbents viz. investment institutions, banks and insurance firms [6]. Fintech organizations habitually work with diverse regulatory frames, permitting them to be an extra advanced and versatile in evolving new goods and services. Governing sandboxes have been initiated in many dominions to enable this novelty by providing a organized environs for fintech corporations to assess their concepts and solutions [7].

FinTech has arisen as a world-shattering business in the finance and economics sectors. The primary aim of Fintech has deployment of information technology to augment competence in financial markets and dealings for numerous stakeholders, comprising users, banks, corporations etc. [8]. This industry-wide revolution has

led to the development of new players and the merging of competencies. The upswing of virtual banking and mobile payment choices, enabled has ominously contributed to the popularity of electronic financial transmissions [9]. This evolution from old cash-based transactions to digital moneys has led to a clouding of the lines between data and money, representing a fundamental swing in the economic landscape.

One of the key returns of fintech is its prospective to make money more transparent, consumer-friendly, and economical [10]. By leveraging fintech, Banks can streamline procedures, decrease costs, save time and offer more modest pricing compared to old-style financial service sources [11].

Fintech and banking are becoming increasingly entangled as to reshape the financial sector. Fintech companies' innovative technologies, viz. data analytics, artificial intelligence, blockchain etc. has played tremendous role in delivering enhanced financial services and products [12] [13]. These progressions have the potential to transfigure outmoded banking practices, hence, offers greater convenience, accessibility to consumers and efficiency.

Moreover, Fintech has changed the old banking models by initiating alternative ways of providing financial benefits [14]. A few examples of how fintech has changed how people and organisations handle their money include peer-to-peer lending platforms, mobile banking applications, and digital wallets [15] [16]. By lowering entrance barriers and granting access to previously excluded groups, these technologies have the potential to democratise financial services, particularly in underserved areas and emerging economies.

Collaboration between financial institutions and fintech companies has also grown in popularity. Fintech technologies are being used by traditional banks to better risk management, streamline operations, and improve customer experience. Fintech companies and banks are collaborating to create new products that combine the agility and technology breakthroughs of fintech with the security and stability of established financial institutions [17] [18] [19]. Fintech's emergence in banking, however, also brings with it difficulties and things to think about. To keep up with the changing environment and provide consumer protection, data privacy, and cybersecurity, regulatory frameworks must be updated [20] [21] [22] [23]. Further investigation is also necessary in light of worries about risk management, financial stability, and the probable extinction of existing banking structures.

In conclusion, the integration of fintech and banking is reshaping the financial industry, offering new possibilities for consumers, businesses, and financial institutions alike. As this relationship continues to evolve, further research is needed to understand the implications, opportunities, and potential risks associated with fintech's influence on the banking sector.

The research questions for the current study are presented in the next section.

1.1 Research Issues

A fascinating area of study with many potential directions to take is the nexus between fintech and banking. Two primary research issues will be addressed in this study:

RQ1: Where is fintech and banking research at the moment?

To offer a summary of the state of the art in the topic, this question aims to undertake a thorough study and analysis of the available research. This study attempts to provide a thorough overview of the research environment on banks and fintechs by reviewing the literature, detecting trends, and analysing the results.

RQ2: What are the future research prospects and suggestions in the realm of fintechs and banks?

This query intends to highlight and suggest prospective topics for further research and development in the field of banks and fintechs. This study aims to identify the unrealized potential for research in this area by taking into account new trends, technical changes, regulatory developments, and industrial dynamics. It seeks to shed light on the potential areas for future study as well as the possibilities that exist for academics and industry professionals in banking and fintech.

1.2 Flow of study

The study's goal, inspiration, and knowledge contribution are explained in Section 1's introduction. The literature review is presented in Section 2 after which the materials and procedures used in the study are covered in the ensuing section. The results and discussion are reported in Section 4, which is followed by the final section's concluding remarks. This study intends to contribute to the body of knowledge, offer a direction for future research, and promote a deeper comprehension of the dynamic interaction between fintechs and banking by addressing these research issues.

II. LITERATURE REVIEW

For the purpose of paper evaluation, this study employs a systematic literature review (SLR) method, specifically focusing on the theory-based review technique. Among the four commonly utilized systematic review procedures, namely domain-based, method-based, theory-based, and meta-analytical-based reviews, the SLR technique chosen in this research falls under the category of theory-based review. [24]. The study's chosen documents are examined using a theory-based methodology to determine the existing status of research on banks and fintechs as well as potential future research opportunities and directions in this area.

Fintech encompasses various areas, which can be broadly categorized as follows:

(i) Capital-raising services, deposits, and credit.
(ii) Clearing, payments, and settlement services, including digital currencies.
(iii) Investment management services, which include trading.
(iv) Insurance-related services.

This conclusion was reached after reviewing the relevant literature.

The term "FinTech," short for "financial technology," denotes the rise of technology-driven start-ups and novel entities that bring forth innovation either at the heart or on the outskirts of financial services. These entities offer solutions that empower consumers and financial institutions to more efficiently manage their money and finances.

In Figure 1, the changes in the traditional banking sector resulting from the adoption of technology, such as AI/ML, Datacloud platform, DLT, Crypto, and mobile, are depicted. The labels H, M, and L indicate the extent of influence, where H represents high impact, M represents medium impact, and L represents low impact.

The constraints of the conventional banking system are also explained in the image, along with the driving forces towards the adoption of technology in banking.

User Needs	Traditional Model	Gaps[b]	Technological Innovations[c]				Fintech Solutions
			AI/ML	Data/Cloud Platforms	DLT/ Crypto	Mobile	
Pay	Cash/ATM Check Wire/MTO's Debit/Credit Centralised Settlement	Speed	L	H	H	H	Virtual currencies Remittances Mobile payments Mobile PoS P2P payments B2B transactions DLT-based settlement
Save	Bank deposits Mutual funds Bonds Equities		L	H	H	L	Virtual currencies Mobile market funds Blockchain bonds
Borrow	Bank loan Bonds Mortgages Trade credit	Cost Transparency	H	H	H	L	Credit modeling platform lending Crowd-funding Blockchain bonds Auto-underwriting
Manage Risks	Brokerage underwriting Structured products Trading regulatory Compliance KYC Insurance	Access Security	H	L	H	L	Regtech, Smart contracts Suptech Crypto-asset exchanges eKYC, Digital ID
Get Advice	Financial planner investment advisor		H	M	L	M	Robo-advising Automated wealth management

Figure 1 Evolution of Financial Services
Source- Murinde et al. 2022

FinTech, or Financial Technology, plays a vital role in the financial ecosystem by offering innovative solutions that address existing gaps in financial service delivery. By leveraging existing technological advancements, FinTech companies provide creative and convenient alternatives to traditional banking systems. These advancements enable broader access to financial services, particularly for underserved populations. Through data-driven approaches and AI/ML, FinTech enhances risk assessment and tailors personalized financial solutions, leading to higher customer satisfaction. Additionally, FinTech encourages competition and collaboration in the financial sector, fostering overall growth and stability in the economy.However, each technical advancement may have a varied effect on the development of a solution for a given demand.

This technology's adoption aims to lower the costs related to finding trustworthy partners for transactions, achieve economies of scale in collecting and using large amounts of data, enable more affordable and secure information transfer, and lower the costs related to verification procedures.
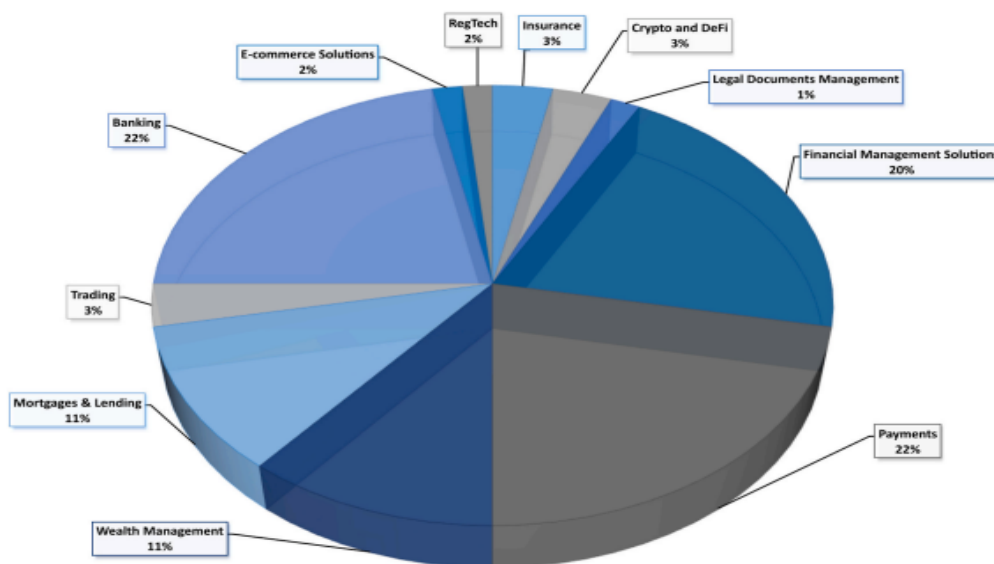
Figure 2 UK Banks' Investment in FinTech Spaces
Source- Murinde et al. 2022

Figure 2 showed that adoption of FinTech by banking is 22% as compared to other financial sectors. The Table 1 below presents the review based papers in the field of FinTech and Banking published between 2019 to 2023. Table 1 Review based papers published for FinTech and Banking in last five years.

Title	Author	Year	Objective	Tool used for SLR	Key Findings	Future Scope
Fintech in islamic finance literature: A review	[25]	2020	This study reviews Islamic FinTech research development from 2017 to 2022.	bibliometric and content analysis	The study finds potential for cointegrating FinTech into Islamic finance to benefit the unbanked and small-medium-size businesses, the adoption of FinTech in Islamic finance will also help the government improve financial inclusion, conquer financial crises, such as COVID-19, and achieve SDGs for a sustainable nation.	The paper suggests 31 future scope of research

Operational research and artificial intelligence methods in banking	[26]	2023	The article reviews the main topics of this research, including bank efficiency, risk assessment, bank performance, mergers and acquisitions, banking regulation, customer-related studies, and fintech in the banking industry.	structured bibliographic survey	The survey results provide comprehensive insights into the contributions of OR and AI methods to banking.	The paper proposes several research directions for future studies that include emerging topics and methods based on the survey results.
Fintech and access to finance	[27]	2022	This article focuses the review on access through fintech. This article reviews the growth of three main fintech technologies, fintech lending (incl. peer-to-peer lending), crowdfunding and initial coin offerings.	NA	It seems that fintech improves access to finance, opening up opportunities for new types of projects and attracting new categories of investors.	suggest some potential avenues for future research in this field
Fintech forensics: Criminal investigation and digital evidence in financial technologies	[28]	2022	This paper describes an emerging sub-discipline of digital forensics covering financial technologies, or Fintech.	NA		suggest some potential avenues for future research in this field

New energy industry financial technology based on machine learning to help rural revitalization	[29]	2023	This paper used machine learning algorithms to apply new energy industry fintech technology to rural revitalization.	Predictive analysis	It can not only reduce the problem of rural information asymmetry, but also improve the rural economic level by 13.7%, which laid the foundation for the implementation of the strategy of technology-assisted financial services for rural revitalization.	NA
Digital financial inclusion: A gateway to sustainable development	[30]	2022	A systematic literature review explores digital financial inclusion across countries.	PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses	This research finds that developing countries, mainly Asian countries, embrace and improve digital financial inclusion to help reduce poverty.	NA
A review of Blockchain Technology applications for financial services	[31]	2022	This paper focuses on Blockchain technology and its importance for financial services. Further takes up various tools, strategies, and featured services in Blockchain-based financial services.	NA	This technology is gaining ground in banking payments. People exchange money mainly through their bank accounts; therefore, payments are crucial. Banks have long been at the forefront of the digital revolution, accepting disruptive developments in exchange for reliable payments and printing their digital currencies.	NA

Blockchain and its derived technologies shape the future generation of digital businesses: A focus on decentralized finance and the Metaverse	[24]	2023	This study explored the evolution of digital businesses in the near future, with a specific focus on the two primary technologies decentralized finance (DeFi) and the Metaverse	NA	This study provides several guidelines, such as how to use DeFi 2.0 and apply centralized decentralized finance (CeDeFi)-based platforms.	It offers future directions for launching these businesses, including controlling the progress of artificial intelligence (AI) in practical applications, utilizing cloud-assisted models for the Metaverse, and providing conditional privacy for future Metaverse-based businesses.
The use of predictive analytics in finance	[32]	2022	The study comprehensively covers classification, regression, clustering, association and time series models.	predictive analytics	It is suggested that these can all be embedded in DSS to aid management decision making.	They suggest that future research in this area could apply Random Forest methods to determine which features are likely to produce

						better results.
Credit scoring methods: Latest trends and points to consider	[33]	2023	This article aims at providing a systemic review of the most recent (2016–2021) articles, identifying trends in credit scoring using a fixed set of questions.	Survey Methodology	Articles, in the scope of our analysis, illustrated how various statistical and machine learning techniques could be employed at different stages of credit scoring.	Future research on the topic might compare our results and the results of1 with the articles to be published in the years to come.
Artificial intelligence and machine learning in finance: Identifying foundations, themes, and research clusters from bibliometric analysis	[34]	2022	This study provide an overview of AI and ML research in finance.	co-citation and bibliometric-coupling analyses	This study highlights trends and research directions regarding AI and ML in finance research	The results provide guidance for future researchers, as well as focus for assessing the growing emphasis on AI and ML in finance research.

Virtual Customer Assistants in finance: From state of the art and practices to design guidelines	[35]	2020	The study performs an analysis of the state of the art and practices of VCAs in the financial domain.	Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA)	Both research and practice show that there are significant developments regarding VCAs for the financial domain	Three future research directions are mentioned in this paper.
The state of play of blockchain technology in the financial services sector: A systematic literature review	[36]	2022	This research presents a systematic review of scholarly articles on blockchain technology in the financial sector.	NA	This study presents a classification framework that has three dimensions: blockchain-enabled financial benefits, challenges, and functionality.	The study also presents future research directions.
Regulatory technology (Reg-Tech) in financial stability supervision: Taxonomy, key methods, applications and future directions	[37]	2021	This study aims to comprehensively review the application of smart technology in financial stability regulation, and analyze the objects and results of the technology's applications	NA	The study builds a framework for the application of complex networks, knowledge graphs, machine learning, and dynamic systems in Reg-Tech.	This Study also discusses future research and development directions.

Deep learning for financial applications : A survey	[38]	2021	This paper provide a state-of-the-art snapshot of the developed DL models for financial applications	NA		The future direction for DL research in Finance is discuss

Source: Compiled by Authors

Table 1 indicates that historically, one of the industries that has used information technology (IT) the most is the financial services sector. In the 1960s, banks were among the very first industries to take risks with using mainframe computers to automate record-keeping and reduce the amount of paper used for various operations. After 30 years, when personal computers became the standard and software engineering provided institutional users with a wide range of applications, investments in general-purpose technology increased even more with the goal of boosting operational effectiveness and reducing costs. Up until very recently, banks launched substantial IT initiatives to totally digitise their records and further automate their operations in order to provide their clients with faster and more affordable services. However, these kinds of technological expenditures didn't do much to fundamentally rethink value chains across the various service lines or redesign products to fit the digital age.

In light of the aforementioned, banks' own heritage is today one of their major problems. The majority of present technologies, corporate practises, and "institutional logics" were developed during the industrial revolution, a time when paper-based operations, currency, and checks were the norm. Back then, banks developed their products and services to satisfy the needs of both their corporate and retail customers. Additionally, deposit-taking financial intermediaries continued to expand their product lines to meet demand when new product demands appeared.

As a result, a product-focused organisational and technological structure resulted in information silos that made it difficult to get a complete view of customers and their shifting needs. As can be seen, offering a digital representation of the current environment and tolerating a disjointed information architecture will not help banks remain competitive, especially in the face of technology firms and sizable institutions from the telecommunications and other industries (i.e. BigTechs) that are looking to exploit opportunities and enter certain sectors of the finance industry.

The next section presents the material and methods used to conduct the systematic literature review in the current study.

III. MATERIALS AND METHODS

The Science Direct search engine is used to evaluate the systematic literature review completed for the current investigation. This lowers the expense of manual article classification and enables us to analyse publications that are most pertinent to our keyword research.

Over the past five years, the number of publications has continued to increase exponentially: Science Direct has 563 review articles in the fields of banking and fintech. The information is provided as follows: for keywords - fintech bank banking, the Review articles found were 35 which are spread in five years as 2023 (6), 2022 (10), 2021 (11), 2020 (6), 2019 (2). And for keywords - technology bank banking, the Review articles found 528 which are spread in five years as 2023 (77), 2022 (137), 2021 (122), 2020 (90), 2019 (102). On the other hand if the keywords used were FinTech, Bank, Banking, Technology; then the total

review articles found are only 32 which are spread over five years as 2023 (5), 2022 (9), 2021 (10), 2020 (6), 2019 (2).

Thus, the steps adopted to conduct the systematic literature review in current study is explained below -

Total 35 review articles from ScienceDirect were taken which were published between 2019 to 2023 sort by relevance to the keywords - fintech, bank, and banking. After reviewing the abstract of these 35 articles to filter out articles which were not related to FinTech and banking, only18 articles were suitable to the objective of the study. Then keeping the time span same and keywords as technology, bank, banking, now a total of 528 review articles were found. After reviewing the abstract of these papers to filter out articles which were not related to FinTech and banking, only 87 articles were found suitable for study. The total of both sets of paper is 105 (15 + 87) but after removing papers which were repeated in both sets, the total paper reviewed comes out to be 94. Thus, for current study, a total of 94 papers were reviewed.

For each of these articles, table 1 in the literature review section presents the title, author, publication date, objective of study, methodology used, key finding of study and future scope of research mentioned in the study.
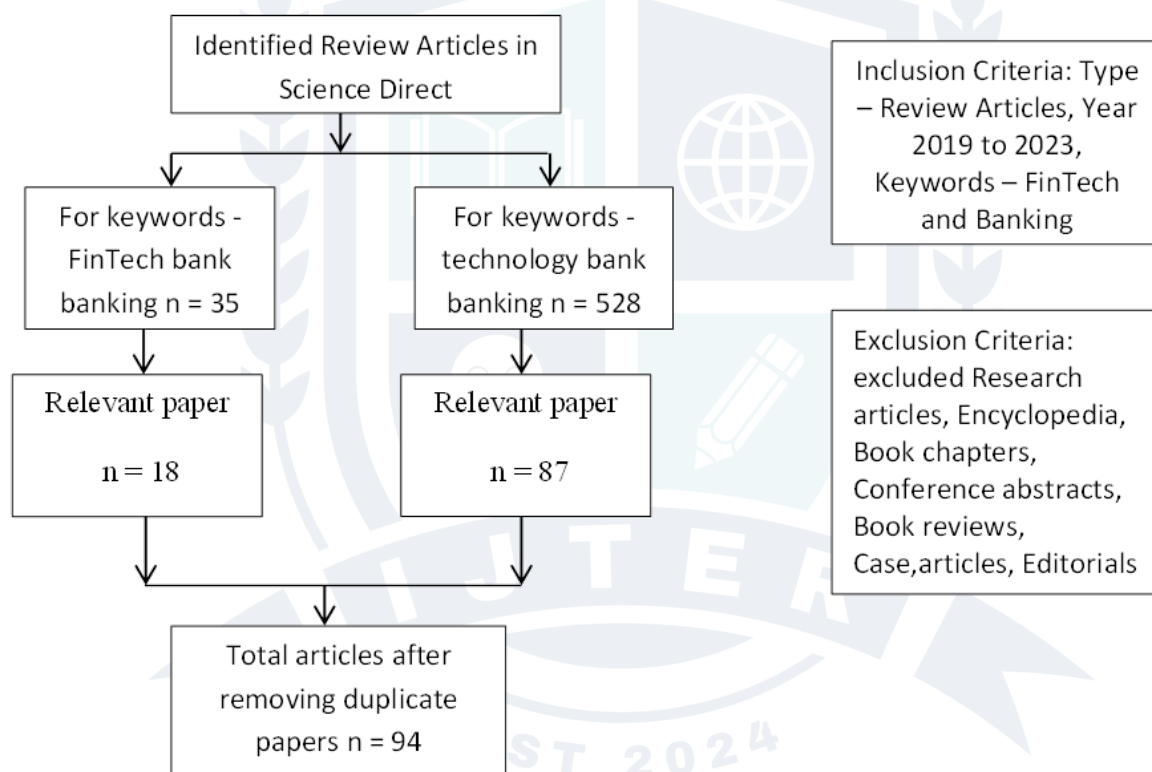

Figure 3 Document Selection Flow diagram
Source - Author Compilation

IV. RESULTS AND DISCUSSION

Table 2 Number of articles and Publication year

Publication year	Number of review articles
2023	82
2022	146
2021	132
2020	96
2019	104

Table 2 above demonstrates the trend in the publication of review-based articles in the banking and fintech fields. With the exception of 2019, where there is a fall in publications, the number of publications has increased exponentially during the previous five years.

Figure 4- Keywords network

Figure 5 - Keywords network

Figure 4 and Figure 5 show that most studies used the following keywords - FinTech, Blockchain, Financial inclusion, crowdfunding, cryptocurrency, digital finance, blockchain, artificial intelligence, etc.

The next section presents the findings of two research questions raised in this study.

IV. A Findings From SLR

RQ1: What is the current state of research on FinTechs and banks?

The section that follows provides an overview of the related research questions that the authors from 2019 to 2023 to perform SLR on FinTech and Bank addressed.

- Development of Fintech
- The banking industry's use of fintech, customer-related research, mergers and acquisitions, risk assessment, performance, and mergers and acquisitions.
- Initial Coin Offerings (ICOs), crowdfunding, and fintech loans, including peer-to-peer lending
- Digital financial inclusion
- Blockchain, Artificial Intelligence, Machine Learning in banking
- Smart technology in financial stability regulation
- Virtual Customer Assistants in finance
- Decentralized financial infrastructure (DeFi) and the MetaverseCredit Scoring Method
- Financial innovation and bank financial performance
- Future digital enterprises are shaped by blockchain and its derivative technologies, with a focus on decentralized finance and the Metaverse.
- FinTech forensic
- Regulatory Technology or RegTech

The section below summarizes journals publishing Review articles on SLR on FinTech and Bank from 2019 to 2023.
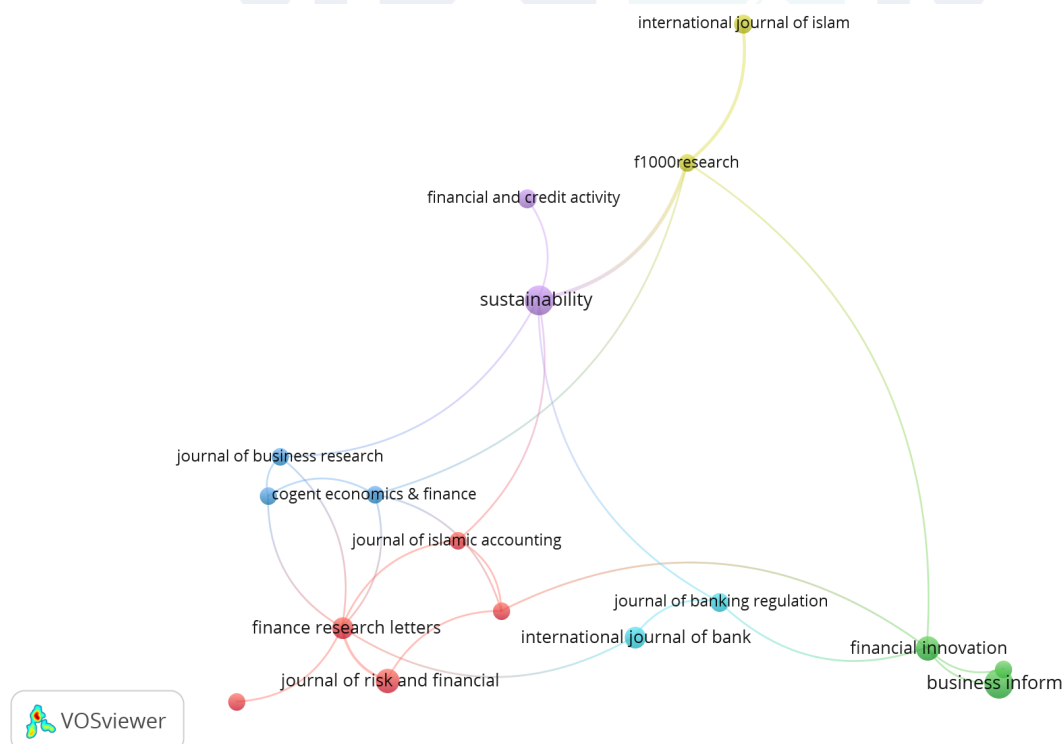

Figure 6: Sources of research articles using VOSviewer (Source- Author Compilation)

Table 3: The count of journals publishing Review articles

JOURNAL	No. of Review Articles
1) Borsa Istanbul Review	4
2) China Journal of Accounting Research	3
3) Data Science and Management	1
4) Ecological Economics	2
5) Emerging Markets Review	1
6) European Economic Review	1
7) Food Policy	3
8) Forensic Science International: Digital Investigation	4
9) Geoforum	2
10) Industrial Marketing Management	3
11) Information Systems	3
12) International Economics	2
13) International Journal of Forecasting	1
14) International Journal of Information Management	7
15) International Review of Financial Analysis	8
16) Japan and the World Economy	1
17) Journal of Behavioral and Experimental Finance	6
18) Journal of Business Research	1
19) Journal of Corporate Finance	5
20) Journal of Industrial Information Integration	5
21) Journal of International Money and Finance	1
22) Journal of World Business	4
23) Long Range Planning	1
24) Pacific-Basin Finance Journal	5
25) Physica A: Statistical Mechanics and its Applications	1
26) Research in Globalization	2
27) Research in International Business and Finance	9
28) The Journal of Finance and Data Science	2
29) The Journal of Strategic Information Systems	3
30) World Development	2
TOTAL	94

Figure 6 and table 3 shows the journals which are accepting and publishing the Review based papers related to FinTech and banking in the previous five years. The maximum number of papers are published in –

- International Journal of Information Management
- International Review of Financial Analysis
- Research in International Business and Finance.

The figure 7 below shows the country wise distribution of Review based publication in field of FinTech and Banking from different countries around the world.
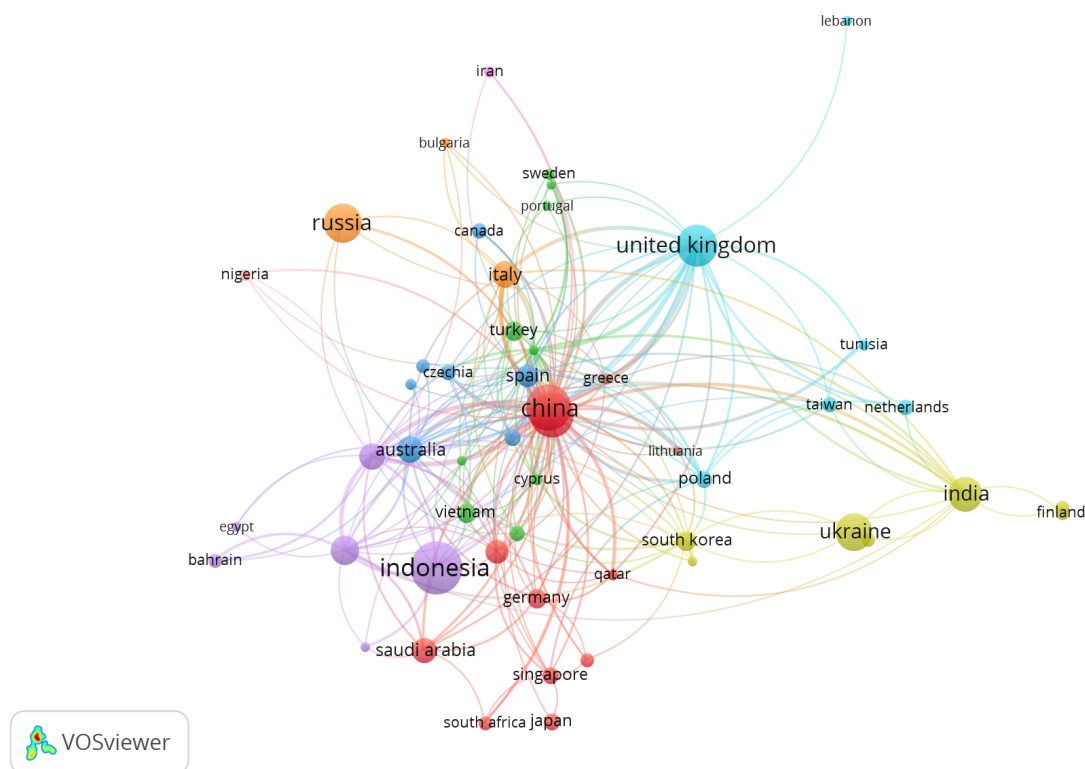
Figure 7 - Country wise publication data using VOSviewer
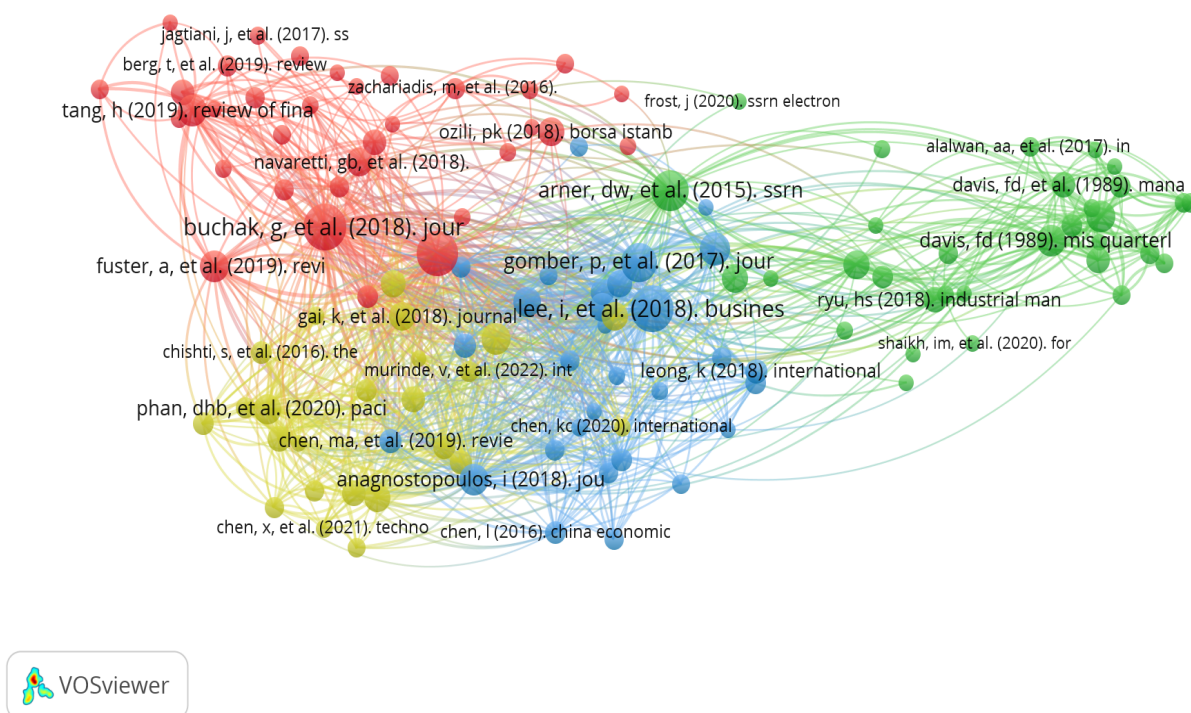Source- Author compilation

Figure - Bibliometric Analysis using VOSviewer
Source- Author Compilation

Figure 8 above the distribution of authors who have contributed in the field of FinTech and banking. The network shows the author citing other papers in their study.

Section below deals with the second research question of the current study.

IV.B FUTURE SCOPE OF RESEARCH

RQ2: What are the future research opportunities and directions in the realm of Fintech and banks?

This bibliometric analysis of the evolution of FinTech in scholarly studies indicates numerous areas for future investigation:

FinTech has an interdisciplinary nature because it intersects with economics, computer science, and law. Future research could look into these disciplines' combined efforts and their contributions to the growth of FinTech.

FinTech is significantly affected by technical breakthroughs like as Blockchain, Artificial Intelligence, and Machine Learning. It would be beneficial to investigate the application and impact of these developing technologies in FinTech.

Regulatory Frameworks: The FinTech regulatory landscape is complicated and ever-changing. Future research might look at how regulatory frameworks are adapting to the rise of FinTech, as well as the possible repercussions for the financial industry.

User Adoption and Behavior: The success of FinTech is dependent on user adoption.

Identity verification in banking by using blockchain technology is faster and less likely to be faked than traditional techniques. The development of decentralized identity verification systems using blockchain technology could be the subject of research. This could give people more control over their personal information while guaranteeing safe and open verification procedures.

Contribution of Fintech in BaaS (Banking as a Service)

These directions aim to drive innovation, improve security, foster inclusion, ensure compliance, enhance customer experiences, and promote ethical practices. One should keep in mind that these scenarios are theoretical and could be the subject of further study. The actual focus of banking and fintech research will rely on several variables, including technical developments, legislative frameworks, and consumer desires.

V. CONCLUSION

Based on the systematic literature review conducted using the Science Direct search engine, a total of 94 relevant papers were reviewed. These papers were selected based on their relevance to the keywords "fintech," "bank," and "banking" or "technology," "bank," and "banking" published between 2019 and 2023. The review identified a significant growth in the number of papers in the field of fintech and banking, with 563 review articles alone found on Science Direct. In conclusion, the systematic literature review provided a comprehensive overview of the current research landscape in the field of fintech and banking. The findings highlight the growing interest in this area and the diverse range of topics and methodologies being explored. The review serves as a valuable resource for researchers and practitioners seeking to understand the latest developments, identify research gaps, and explore future research directions in the fintech and banking domain.

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